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An Electricity Regulation Primer—The History of Electricity Regulation in the United States

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AN ELECTRICITY REGULATION PRIMER—
THE HISTORY OF ELECTRICITY REGULATION IN THE UNITED STATES

Jada F. Garofalo[*]

TABLE OF CONTENTS

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I am grateful for the comments and revisions offered by Melissa Firestone, who gave instrumental input to the sections covering PSC rate-setting and state-initiated divestment and deregulation.

I. Introduction

Understanding the regulatory backdrop of the electricity sector in the U.S., and how it has shifted from one that institutionalized the natural monopoly characteristics of a fully integrated utility to one that facilitates competition through open access transmission and generation dispatch markets, offers an integral perspective through which states may navigate the impending shift in generation, regardless of the regulatory scheme that operates where they sit. This paper provides the history of electricity regulation in the U.S. Future work will explore and recommend ways to value, prioritize, and define resiliency in electricity systems in order to facilitate the forthcoming transition that is likely to encompass varied forms of electricity generation and numerous regulatory schemes.

II. The History of Electricity Regulation in the United States

Many entities are involved in the electric power industry. As a result of this layered involvement, electricity regulation occurs at local, state, and federal levels. This paper serves as an overview of that regulatory process. It discusses electricity-sector regulations as they have emerged over time, with the last section summarizing the status of the regulatory framework today, providing a concise overview of electricity regulation in one document.

a. State & Local Origins

In 1879, Thomas Edison "illuminated" an industry with his invention of the light bulb and the concept of electricity[1] expanded as more people sought the service.[2] By 1882 the first centralized generation station was installed on Pearl Street in New York City and electricity started to become part of everyday life.[3] Regulatory oversight followed, mirroring the industry, evolving from "small, isolated, and individual electricity grids . . . to systems growing increasingly larger

[1] Electricity is "a form of energy that can be produced, confined, controlled, transmitted and distributed, to be used as an energy source for heat, power, and light." 27A AM. JUR. 2D *Energy and Power Sources* § 4 (2021).

[2] Michael Panfil, *From Attleboro to EPSA*, 38 UCLA J. ENVTL. L. & POL'Y 1, 5 (2020). While electricity itself is considered *a consumable product* and, thus, a commodity in economic terms and personal property in terms of the law, distribution of electricity is considered a *service*. 27A Am. Jur. 2d Energy and Power Sources § 4 (citing *Ransome v. Wisconsin Elec. Power Co.*, 87 Wis. 2d 605, 275 N.W.2d 641 (1979); *Ashwander v. Tennessee Valley Authority*, 297 U.S. 288, 56 S. Ct. 466, 80 L. Ed. 688 (1936); *People v. Menagas*, 367 Ill. 330, 11 N.E.2d 403, 113 A.L.R. 1276 (1937); *Hetherington v. Camp Bird Min., Leasing & Power Co.*, 70 Colo. 531, 202 P. 1087 (1921); *Sixty-Seven South Munn v. Board of Public Utility Com'rs of New Jersey*, 106 N.J.L. 45, 147 A. 735 (N.J. Sup. Ct. 1929), aff'd, 107 N.J.L. 386, 152 A. 920 (N.J. Ct. Err. & App. 1930)).

[3] Panfil, *supra* note 2, at 5.

in scale" necessitating state, and eventually federal, regulations that comprise the patchwork of regulations that characterize the regulatory system of today.[4]

i. Early Electricity Systems

The structure of electricity systems has remained relatively constant since the late 1800s, and involves three linked processes that work in tandem to supply electricity to end users: *generation*, *transmission*, and *distribution*.[5]

Generation, is the "process of producing electric energy by transforming other forms of energy[, and is often] . . . expressed in kilowatt[-]hours."[6] *Transmission* occurs via an "interconnected group of lines and associated equipment[,]" which facilitate the transfer of electric energy between points of supply and points of demand.[7] Transformers are typically located at the intersection between transmission lines and distribution networks; they "step-down" the voltage to lower, less efficient, voltages that are safer for local distribution.[8] *Distribution* systems are the lines that facilitate delivery of electrical energy to retail customers, including residences, businesses, or industrial customers.[9]

For most of the 20th century, electric utility companies operated and owned their own generation, transmission, and distribution resources within their service area.[10] This model of ownership stemmed from the widely accepted economic concept that a utility is a natural

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[4] *Id*.

[5] Lauren Dunlap et. al, Electricity 101: Terms and Definitions Basics of the electric grid and the power industry, explained, RESOURCES FOR THE FUTURE, https://www.rff.org/publications/explainers/electricity-101/?gclid=Cj0KCQiA9P__BRC0ARIsAEZ6irjlSbDRullachVuzJ9wSB5Cv25eSdzqxzMntRO-ylUl5QLMPNqdyaEaAulPEALw_wcB.

[6] ENERGY INFORMATION ADMINISTRATION, Glossary, "Transformer", https://www.eia.gov/tools/glossary/?id=electricity#:~:text=The%20common%20fossil%20fuels%20are,as%20its%20source%20of%20energy.&text=Generation%3A%20The%20process%20of%20producing,energy%20produced%2C%20expressed%20in%20kilowatthours.

[7] *Id*.

[8] Dunlap, *supra* note 5; ENERGY INFORMATION ADMINISTRATION, Glossary, "Generation", https://www.eia.gov/tools/glossary/?id=electricity#:~:text=The%20common%20fossil%20fuels%20are,as%20its%20source%20of%20energy.&text=Generation%3A%20The%20process%20of%20producing,energy%20produced%2C%20expressed%20in%20kilowatthours.

[9] *Id*.

[10] U.S. ENVIRONMENTAL PROTECTION AGENCY, State Climate and Energy Technical Forum Background Document, An Overview of PUCs for State Environment and Energy Officials, May 20, 2010, at 1, https://www.epa.gov/sites/production/files/2016-03/documents/background_paper.pdf.

monopoly. Utility companies were traditionally vertically integrated with sole ownership and operational control over the electricity resources within their respective service area.[11]

ii. State & Local Regulatory Efforts

Early efforts to regulate electric utility companies occurred at the local level. Utility companies needed to attain rights-of way for their distribution lines and would franchise, or contract, with municipalities.[12] Franchise agreements specified rights and responsibilities of each party for a fixed period of time (usually 20-50 years but varying considerably by municipality).[13] The contracts included terms and availability of service, rights-of-way for distribution equipment, maximum prices, competitive conditions, and discounts to the municipal governments among other things.[14] Municipal contracts provided no mechanism for government oversight or modification of the franchise under changing circumstances, and utilities were typically only offered monopoly protection for the first few years of operation.[15] Widespread corruption was common under municipal franchise agreements; municipal officials commonly extorted utilities to maximize their income, and utilities commonly bribed municipalities in order to stay in business.[16]

The realization that neither the interests of utilities nor those of consumers were served by the corruption that pervaded the franchise regulatory structure led to regulatory change.[17] States began to pass legislation enabling state regulatory bodies to regulate public utilities, (commonly

[11] *Id*.

[12] William J. Hausman & John L. Neufeld, *How politics, economics, and institutions shaped electric utility regulation in the United States: 1879–2009*, 53 BUSINESS HISTORY 5, 723-746, at 725-726 (2011); John L. Neufeld, *Corruption, Quasi-Rents, and the Regulation of Electric Utilities*, 68 J. ECON. HIST. 4, 1059-1097, at 1059-61, (2008), https://www.jstor.org/stable/40056469.

[13] Hausman & Neufeld, *supra* note 12, at 725-726; Neufeld, *supra* note 12, at 1059-61.

[14] *Id*.

[15] Hausman & Neufeld, *supra* note 12, at 725-726.

[16] Often, municipalities would threaten to go into competition with another utility unless a bribe was paid by the contracted utility. Paying the bribe reduced the utility's revenue, inhibiting it from investing in its long-term operations. As a result, utilities often could not afford the enormous fixed costs associated with maintaining and building generation and distribution equipment, but because they earned enough revenue to cover their operational costs and payed the municipality's bribes, they remained operational. Municipal threats inhibited development of new utilities, discouraged investors from funding new utilities, and increased the costs of maintaining operational utilities, all of which resulted in a decline in service quality. Hausman & Neufeld, *supra* note 12, at 725-726; Neufeld, *supra* note 12, at 1059-61.

[17] Hausman & Neufeld, *supra* note 12, at 725-726; Neufeld, *supra* note 12, at 1059-61.

called "Public Service Commissions", "Public Utility Commissions", "Utility Commissions", or "Utility Regulatory Commissions"; hereinafter, "PSCs") by providing oversight and prescriptive control over electric utility company retail rates and terms of service.[18] By 1920, most states legislatively awarded PSCs authority over electric utilities, with the remaining states following suit in a staggered fashion through 1975.[19] While variations exist between the states insofar as specific PSC obligations and duties, there are many commonalities. States typically create PSCs to act as quasi-judicial and administrative bodies with the authority to conduct rulemaking proceedings, to review and approve utility cost of service and service rates, to oversee resource planning, to ensure reliability and quality of service, and to conduct enforcement proceedings.[20] PSCs proceedings may be administrative or quasi-judicial. Utilities and PSCs effectively enter into a regulatory compact, or a non-binding agreement that describes the obligations of each party, specifying the utility's obligation to provide quality service at a reasonable price and consent to regulation.[21]

iii. Regulatory Gaps Emerge

Technological advancements in the 1920s allowed for an increase in the geographical area of transmission networks, which resulted in the interconnection of multiple generation sources and users over vast geographic.[22] These networks were economically advantageous because they reduced the amount of equipment needed by a utility company, allowed for an efficient mix of diverse generation assets, and spread peak demand across time zones, which stabilized demand

[18] Notably, PSCs were first established in the mid 1800s to oversee railroads, but were not granted regulatory authority over electric utilities until the early 1900s. Inara Scott, *Teaching an old dog new tricks: Adapting Public Utility Commissions to Meet Twenty-First Century Climate Challenges*, 38 HARV. ENVTL. L. REV. 371 (2014) (citing Charles F. Phillips, The Regulation of Public Utilities 122 (1988); William E. Mosher & Finla G. Crawford, Public Utility Regulation 17 (1933); William J. Hausman & John L. Neufeld, *The Market for Capital and the Origins of State Regulation of Electric Utilities in the United States*, 62 J. ECON. HIST. 1050, 1051 (2002)); Hausman & Neufeld, *supra* note 12, at 725-726; Neufeld, *supra* note 12, at 1059-61. The Supreme Court upheld state regulatory authority over PSC-set rates "affected with public interest," most prominently in *Munn v. Illinois*. In that decision the Supreme Court held that states could intervene to set pricing and this was not a depravation of property without due process so long as the public interest was central to the decision. The moment public interest becomes the central factor, a good ceases to be a private property and can be regulated by state police power. (*Munn v. People of State of Illinois*, 94 U.S. 113, 24 L. Ed. 77 (1876)).

[19] Hausman & Neufeld, *supra* note 12, at 734.

[20] U.S. EPA, *supra* note 10.

[21] *Id*.

[22] Hausman & Neufeld, *supra* note 12, at 728.

within the interconnected region.[23] Larger transmission networks led to two dilemmas that found resolution in the Federal government's hands.

First, issues arose surrounding PSC regulation of interstate electricity transactions in the mid-1920s.[24] In 1927, the Supreme Court resolved an issue between utilities in two states when it held that state PSCs have no jurisdiction to regulate interstate electricity transactions between states because those transactions constitute interstate commerce, and interstate commerce is explicitly delegated to Congress (not the states) by the U.S Constitution.[25] In short, the Commerce Clause[26] prevented state entities, like PSCs, "from regulating certain interstate electricity transactions . . . across state lines."[27] This landmark ruling created what is known as the "*Attleboro* gap."[28] The authority to regulate interstate electricity transactions rested with the Federal government, but no laws existed at the time through which to regulate interstate electricity transactions. Thus, *Attleboro* created a regulatory void that only Congress could fill.[29]

Second, electric utilities began to use holding companies in the 1920s, which had the benefit of spurring American industry productivity—from the use of electricity in manufacturing––but also created financial bubbles and fraud in utility markets, manipulating utility company profits by subverting PSC regulatory authority.[30] Because holding companies were not subject to

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[23] *Id*.

[24] *Public Util. Comm'n of R.I. v. Attleboro Steam & Elec. Co*., 273 U.S. 83, 89–90, 47 S.Ct. 294, 71 L.Ed. 549 (1927), abrogated on unrelated grounds by *Arkansas Elec. Co-op. Corp. v. Arkansas Pub. Serv. Comm'n*, 461 U.S. 375, 103 S. Ct. 1905, 76 L. Ed. 2d 1 (1983). In *Arkansas Elec. Co-op Corp.*, the Court set aside the mechanical line test laid out in *Attleboro* and instead adopted the "modern Commerce Clause jurisprudence" method of looking "in every case to the nature of the state regulation involved, the State's objective, and the effect of the regulation upon the national interest in the commerce involved." 461 U.S. at 375, 103 S. Ct. at 1907 (1983).

[25] *Attleboro*, 273 U.S. at 89–90 (1927).

[26] U.S. Const. Art. I, § 8, cl. 3 ("The Congress shall have the power . . . To regulate Commerce with foreign Nations, and among the several States, and with the Indian Tribes;"). Implicit in this power is the Dormant Commerce Clause, which is defined as "The constitutional principal that the Commerce Clause prevents state regulation of interstate commercial activity even when Congress has not acted under its Commerce Clause power to regulate that activity." *Dormant Commerce Clause*, BLACK'S LAW DICTIONARY, 10th ed. 2014).

[27] F*.E.R.C. v. Elec. Power Supply Ass'n*, 577 U.S. 260, 265–66, 136 S. Ct. 760, 767, 193 L. Ed. 2d 661 (2016*), as revised* (Jan. 28, 2016); *see also* Christiansen & Macey, *Long Live the Federal Power Act's Bright Line*, 134 HARV. L. REV. 1360, at 1371-2 (2021).

[28] Christiansen & Macey, *supra* note 27, at 1371-2 (2021) (citing Jim Rossi, *The Brave New Path of Energy Federalism*, 95 TEX. L. REV. 399, 403–04 (2016)).

[29] *Elec. Power Supply Ass'n*, 577 U.S. at 265–66 (2016) (internal citations omitted).

[30] Hausman & Neufeld, *supra* note 12, at 730-31.

PSC authority or oversight[31] they could charge subsidiary operating companies excessive fees for services performed.[32] Operating companies presented these fees to PSCs as part of their operating expenses recoverable from customers.[33] The PSC had no authority to investigate whether those fees represented actual costs, and this left holding companies free to charge fees in excess of their costs.[34]

Holding companies also adopted questionable financial practices, such as issuing senior securities to finance purchases of operating common stock in order to magnify high profits, which supported issuance of more securities that would increase the operating company's debt.[35] PSCs were hesitant to refuse returns on operating companies' increase in property investment and ownership (which was the basis for regulated profits) for fear of placing the operating company in financial distress.[36] "The apparent impotence of state regulation in the face of holding companies helped stimulate a revival of the debate over whether utilities should be privately or publicly owned."[37] The Federal government began a series of investigations – spanning more than 15 years - to evaluate the extent to which holding companies controlled the electric power industry.[38]

b. The Federal Government Steps in

i. The Federal Power Act of 1935

Congress closed the *Attleboro* gap in 1935 when it passed the Federal Power Act (hereinafter, "FPA").[39] Section 201 of the FPA awarded the Federal Power Commission jurisdiction over rates for the "sale of electric energy at wholesale in interstate commerce" and the

[31] *Id*.

[32] *Id*.

[33] *Id*.

[34] *Id*.

[35] *Id*. at 731.

[36] *Id*.

[37] *Id*. Much of this debate was fuelled by the growing involvement of the Federal government in hydroelectricity under the FPA. (*Id*.).

[38] These investigations lasted from 1916 to the 1930s. *Id*. at 731-32.

[39] Christiansen & Macey, *supra* note 27, at 1371-2.

"transmission of electric energy in interstate commerce."[40] Interstate transmission of electric energy occurs when electricity is "transmitted from a State and consumed at any point outside thereof; but only insofar as such transmission takes place within the United States."[41] Wholesale sales of electric energy are "sales of electric energy to any person for resale" to another person or entity,[42] while retail sales are sales directly to an end-use consumer.[43]

The FPA[44] is construed as a "bright line" demarcating the collaborative but distinct roles of the federal government and the states, and courts have noted that *Attleboro* and the FPA should be read together.[45] In the FPA, Congress awards the FPC jurisdiction over most "rates, charges,

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[40] 16 U.S.C. § 824(b)(1); Christiansen & Macey, *supra* note 27, at 1371-2 (citing *Panhandle E. Pipe Line Co. v. Pub. Serv. Comm'n*, 332 U.S. 507, 517 (1947)) (stating "That jurisdictional divide quickly came to be understood as creating a bright line between state and federal regulators. As far back as the 1940s, the Court explained that '[t]he line of the statute was thus clear and complete. It cut sharply and cleanly between sales for resale and direct sales for consumptive uses. No exceptions were made in either category for particular uses, quantities or otherwise.'"). The Federal Power Commission, established in 1920, was the Federal Energy Regulatory Commission's predecessor agency. (NATIONAL ARCHIVES, RECORDS OF THE FEDERAL ENERGY REGULATORY COMMISSION, (last reviewed Aug. 2016), https://www.archives.gov/research/guide-fed-records/groups/138.html; 16 U.S.C.A. § 792 (1920)).

[41] 16 U.S.C. § 824(c).

[42] *Id*.

[43] Kaylie E. Klein, *Bypassing Roadblocks to Renewable Energy: Understanding Electricity Law and the Legal Tools Available to Advance Clean Energy*, 92 OR L. REV. 235, at 240 (2013) (citing Electricity Terms and Definitions, U.S. Energy Info. Admin., http:// www.eia.gov/cneaf/electricity/page/glossary.html#qr) (stating, "A retail sale of electricity is a sale of electricity to the end user; for example, to a customer in his or her home where the electricity is consumed and cannot be resold.")

[44] In § 201, the FPA defines "Public Utilities" as "any person who owns or operates facilities subject to the jurisdiction of the Commission under this subchapter (other than facilities subject to such jurisdiction solely by reason of section 824e(e), 824e(f), 824i, 824j, 824j–1, 824k, 824o, 824o–1, 824p, 824q, 824r, 824s, 824t, 824u, or 824v of this title)." 16 U.S.C. § 824 (e). As noted in Klein, "The meaning of a 'public utility' is specifically defined in the FPA and is not the same as 'electric utilities' or 'transmitting utilities' as defined in the FPA." (Klein, *supra* note 43, at 240–41 n.8). The FPA defines "electric utility" as a person or federal or state agency that sells electric energy, and "transmitting utility" as an entity that owns, operates, or controls facilities used for the transmission of electric energy in interstate commerce or for the sale of electric energy at wholesale. 16 U.S.C. § 796(22) and (23). Therefore, when discussing electricity regulation, it is important to correctly refer to entities to avoid confusion.

[45] Nordhaus, *The Hazy Bright Line*, 41 ENERGY L. J. 323 (2020) (citing Christiansen & Macey, *supra* note 27, at 1371-2 (citing *FPC v. S. Cal. Edison Co.*, 376 U.S. 205, 215 (1964); *Fed. Power Comm'n v. S. Cal. Edison Co*., 376 U.S. 205, 215, 84 S. Ct. 644, 651, 11 L. Ed. 2d 638 (1964) (stating:

> In *United States v. Public Utilities Comm. of California*, 345 U.S. 295, 73 S.Ct. 706, 97 L.Ed. 1020, the Court said that "Congress interpreted that case (*Attleboro*) as prohibiting state control of wholesale rates in interstate commerce for resale, and so armed the Federal Power Commission with precisely that power," and further than "Part II [of the FPA] is a direct result of *Attleboro*. They are to be read together. The latter left no power in the states to regulate licensees' sales for resale in interstate commerce, while the former established federal jurisdiction over such sales." (internal citations omitted).

and practices" in connection with or affecting wholesale rates, while it preserves exclusive state jurisdiction over generation facilities, retail sales of electricity, and facilities used for local distribution.[46]

Disputes over the FPA's allocation of jurisdiction were rare at its inception, mostly due to the vertically-integrated nature of utilities.[47] At the time of the FPA's enactment, it was common for vertically integrated utilities to produce their own electricity, transmit that electricity over their own transmission and distribution systems, and sell it directly to their retail customers.[48] Thus, wholesale and retail sales were clear cut, merely dependent on the identity of the buyer. A sale to an end-user was clearly a retail sale subject to state jurisdiction; whereas, a sale to a distribution company serving a different service area, was a wholesale sale subject to federal jurisdiction.[49]

Due to the prevalence of a single company having ownership of all aspects of the provision of the utility good (generation, distribution, transmission, and sales), state PSCs retained much of their regulatory control over utility companies, including the aspects of rate recovery for all aspects of the integrated business, including the ownership and operation of generation and transmission assets. Over time, however, many states and the FPC began to pursue competition as a policy priority in portions of the utility business.

The FPC's role and authority has evolved since the FPA's passage in 1935. Over time, this created a piecemeal regulatory effect; different aspects of the electricity system are regulated by different entities. This division of regulatory authority and resulting patchwork of regulations "has,

[46] Christiansen & Macey, *supra* note 27, at 1371-2; 16 U.S.C. §§ 824(b)(1), 824d(b), 824e(a).

[47] *Id*. (citing *Oneok, Inc. v. Learjet, Inc.*, 135 S. Ct. 1591, 1595-96 (2015)).

[48] *Id*. (citing *Conn. Light & Power Co. v. FPC*, 324 U.S. 515, 531 (1945) ("The test [of FPA jurisdiction] is whether they are local distribution facilities. There is no specific provision for federal jurisdiction over accounting except as to 'public utilities.' The order must stand or fall on whether this company owned facilities that were used in transmission of interstate power and which were not facilities used in local distribution."); *Appalachian Power Co. v. Pub. Serv. Comm'n*, 812 F.2d 898, 902 (4th Cir. 1987) (finding a state program preempted because "it create[d] the obligations owed by or payable to utility companies for the privilege of exchanging interstate electricity")).

[49] *Id.* (citing *Conn. Light & Power Co. v. FPC*, 324 U.S. 515, 531 (1945) ("The test [of FPA jurisdiction] is whether they are local distribution facilities. There is no specific provision for federal jurisdiction over accounting except as to 'public utilities.' The order must stand or fall on whether this company owned facilities that were used in transmission of interstate power and which were not facilities used in local distribution."); *Appalachian Power Co. v. Pub. Serv. Comm'n*, 812 F.2d 898, 902 (4th Cir. 1987) (finding a state program preempted because "it create[d] the obligations owed by or payable to utility companies for the privilege of exchanging interstate electricity")).

for decades, engendered controversy."[50] Federal policymakers sometimes complain that state-level generation, transmission siting, and retail rate policies frustrate federal energy policies, while state regulators sometimes complain that federal regulations impede state authority to regulate local distribution and transmission services associated with serving the retail load.[51] The evolution of the comprehensive regulatory framework erected by the FPC, now the Federal Energy Regulatory Commission, is discussed at length below.

ii. Public Utility Holding Company Act of 1935

Congress passed the Public Utility Holding Company Act (hereinafter, "PUHCA") in 1935 after a decade of investigations discovered a sophisticated campaign to support private ownership of utility companies.[52] The Securities Exchange Commission (hereinafter, "SEC") was charged with administering PUHCA and regulating holding companies.[53] The legislation effectively ushered a "death sentence" to holding company systems, granting the SEC authority to breakup large holding company systems and enjoin companies from acquiring more than a small portion of stock in any operating utility in the future.[54]

PUHCA virtually eliminated the participation of non-utilities in in the provision of the power utility service and resulted in a reorganization of the electric industry facilitating increased Federal regulation of wholesale prices of electricity.[55] Holding companies were reduced to a single consolidated fully integrated entity with an obligation to serve all comers over a specific geographic area and could be engaged only in the business essential to the utility.[56] The SEC regulated holding companies. It required registration, a process where the SEC determined whether

[50] Nordhaus, *supra* note 45 (citing 16 U.S.C. § 824a-3 (PURPA § 210) and 16 U.S.C. § 824p (FPA § 216)) (explaining that new laws and additions to the FPA created new regulatory schemes to address issues surrounding the division of federal and state authority, especially as the electricity system evolved and electricity markets became more complex).

[51] Nordhaus, *supra* note 45 (citing *Federal Power Comm'n v. S. Cal. Edison Co.* (*Colton*), 376 U.S. 205, 206-07 (1964)).

[52] Hausman & Nuefeld, *supra* note 12, at 732–33.

[53] Chris Blazek, *Ch. 3 The U.S. Electric Markets, Structure, and Regulations* in ELECTRICITY COST MODELING CALCULATIONS, at 67-68 (Monica Greer ed., Elsevier 2010).

[54] Hausman & Neufeld, *supra* note 12, at 734.

[55] Chris Blazek, *supra* note 53, at 67-68.

[56] *Id*.

the entity would be regulated or exempted from PUCHA.[57] It also oversaw holding company issuance and acquisition of securities, transactions, and political activities.[58] Interestingly, the trend of regulating non-utility actors in the electricity sector has been gradually reversed as competitive principles were gradually introduced and imbedded into the electricity regulatory structure.

iii. The Energy Crisis of the 1970s

The United States electric power industry remained relatively stable for the next few decades, enjoying a "golden age" where "electricity usage increased, prices fell, and political controversy over the industry abated."[59] This period ended in the 1970s due to a convergence of events that created turmoil for the energy industry's organization and regulation.[60]

In the 1970's, estimates for industry growth outpaced actual demand, which led to a large number of generation plants being built only to not be needed.[61] Electricity rates rose since expenses for construction had already been incurred.[62] Contemporaneously, the Arab oil embargo spurred widespread fuel shortages and brought energy issues to the forefront of the nation's attention.[63] The energy industry also began building nuclear power plants during this time, but, due to lack of experience, plants took far longer than planned to bring online.[64] This multiplied consumer costs and delayed the ability for the public utilities to collect its investment and the associated returns.[65]

iv. The Department of Energy Organization Act of 1977

Congress passed the Department of Energy Organization Act in 1977 in response to a shortage of energy resources and an increasing dependence on foreign energy supplies.[66] The Act

[57] *Id*.

[58] *Id*.

[59] Hausman & Neufeld, *supra* note 12, at 735.

[60] *Id*.

[61] *Id*.

[62] *Id*.

[63] *Id*.

[64] *Id*.

[65] *Id*.

[66] Dep't of Energy Organization Act, Pub. L. No. 95-91, § 204, 402; 91 Stat. 565, 571-72, 583-585 (1977) (codified at 42 U.S.C. §§ 7134, 7172 and 16 U.S.C. §§ 792, 824, 824a).

implemented a national energy program under a single department in the Executive branch—now known as the Department of Energy (hereinafter, "DOE")—and relocated the FPC within the DOE, renaming it the Federal Energy Regulatory Commission (hereinafter, "the Commission" or "FERC").[67] The Act awarded the Commission most of the regulatory functions previously held by the FPC.[68]

FERC regulates the transmission of electric energy in interstate commerce, and the sale of such energy at wholesale under the authority of the FPA insofar as the regulation of those acts are not subject to regulation by the States.[69] It does not have jurisdiction over facilities used for generation, local distribution, transmission in intrastate commerce, or transmission facilities that wholly consume the electricity they transmit.[70] The Commission's authority also does not extend to any federal, state, or political subdivision of a state; electric cooperatives financed under the Rural Electrification Act of 1936[71] or selling less than four million megawatt hours of electricity per year; or any agency, authority, or instrumentality of these entities.[72]

The Commission is composed of five voting members, with no more than three from the same political party, who are appointed by the President for staggered terms of four years.[73] It is authorized to establish procedural and administrative rules (influential rulings are referred to as "Orders") to carry out its functions.[74] Some of FERC's influential Orders are discussed at length below.

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[67] 42 U.S.C. § 7134; 16 U.S.C. § 792. The Department of Energy Organization Act created the Federal Energy Regulatory Commission (FERC), which replaced the Federal Power Commission and assumed almost all of its functions, responsible for "carrying out a central, comprehensive, and unified energy data and information program," to "collect, evaluate, assemble, analyze, and disseminate data and information . . . " regarding the adequacy of the Nation's energy resources to meet short and long-term economic and social demands. (Dep't of Energy Organization Act, Pub. L. No. 95-91, § 204, 402; 91 Stat. 565, 571-72, 583-585 (1977) (codified at 42 U.S.C. §§ 7134, 7172 and 16 U.S.C. §§ 792, 824, 824a)).

[68] *Id*.

[69] 16 U.S.C. § 824(a).

[70] 16 U.S.C. § 824(b)(1).

[71] 7 U.S.C. § 901 et seq.

[72] 16 U.S.C. § 824(f).

[73] 42 U.S.C. § 7171(b); Title IV, § 401(b).

[74] 42 U.S.C. § 7171(f); Title IV § 401(f).

FERC is granted much of its regulatory authority under Part II of the FPA, §§ 205 and 206.[75] FERC has authority to regulate interstate transmission and wholesale rates.[76] The Commission also oversees grid reliability in accordance with § 215.[77] While FERC is charged with regulating and overseeing transmission siting under § 216, much of siting authority lies with states.[78] Market manipulation is kept in check by FERC, under the authority of § 222.[79]

The Commission develops rules and regulations under the authority of statutes passed by Congress and through its rulemaking process, which assigns a docket number to each issue and allows for engagement with interested members of the public by issuing a Notice of Proposed Rulemaking (NOPR) in the Federal Register and considering comments.[80] When finalized, regulations become part of the Code of Federal Regulations.[81]

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[75] 6 U.S.C. §§ 791 et seq.; Adam Van, CONGRESSIONAL RESEARCH SERVICE, The Legal Framework of the Federal Power Act (Jan. 22, 2020), https://crsreports.congress.gov/product/pdf/IF/IF11411.

[76] Van, *supra* note 75.

[77] 16 U.S.C. § 824o. "Section 1211 of the Energy Policy Act of 2005 (P.L. 109-58) added Section 215 to the FPA[, which] directs FERC to certify an 'Electric Reliability Organization' (ERO) tasked with developing mandatory and enforceable reliability standards for electric power. FERC subsequently issued Order No. 672 (71 Fed. Reg. 8662 (February 17, 2006)), which designated the North American Electric Reliability Corporation as the ERO, and adopted reliability standards to be enforced by that organization, subject to FERC oversight." Van, *supra* note 75, at 2.

[78] Federal Power Act § 216(h) "Section 1221 of the Energy Policy Act of 2005 added Section 216 of the FPA (16 U.S.C. § 824p), which carves out a small role for FERC and other federal agencies in siting interstate electric transmission facilities[, authorizing] the Secretary of Energy, in consultation with the affected states, to designate areas experiencing electricity transmission constraints or congestion as "national interest electric transmission corridors" (NIETCs)." (Van, *supra* note 75, at 2). Essentially, § 216 provides federal "backstop" authority. Where there is transmission congestion and states have "withheld approval for more than one year", FERC can declare areas NIETCs and intervene and issue permits for interstate electricity transmission facilities. (*Id*. (citing16 U.S.C. § 824p(b)(1)(C)(ii))). Though, *Piedmont Environmental Council v. FERC* held that FERC cannot permit transmission facilities if a state has already *denied* an applicants' request. (*Id*. (558 F.3d 304 (4th Cir. 2009))), And in *California Wilderness Coalition v. U.S. Dep't of Energy*, two NIETC designations were vacated by the Court of Appeals because the agency failed to consult adequately with the states in accord with the FPA. (*Id*. (citing 631 F.3d 1072 (9th Cir. 2011))).

[79] "The Energy Policy Act of 2005 . . . added Section 222 of the FPA (16 U.S.C. § 824v) to ban energy market manipulation. . . . FERC adopted its market manipulation regulations in Order No. 670 (71 Fed. Reg. 4244 (January 26, 2006))." (*Id*.).

[80] FERC's regulations are available at: (NATIONAL ARCHIVES, CODE OF FEDERAL REGULATIONS, (up to date as of Nov. 4, 2021), https://www.ecfr.gov/cgi-bin/text-idx?sid=03ec04560645f79e5801e8f2cac8cbc5&c=ecfr&tpl=/ecfrbrowse/Title18/18cfrv1_02.tpl (last visited Nov. 5, 2021); FERC's processes are summarized on its website: FEDERAL ENERGY REGULATORY COMMISSION, FERC PROCESSES, https://www.federalregister.gov/uploads/2011/01/the_rulemaking_process.pdf (last visited Nov. 5, 2021); FEDERAL ENERGY REGULATORY COMMISSION, FREQUENTLY ASKED QUESTIONS, https://www.ferc.gov/about/what-ferc/frequently-asked-questions-faqs/frequently-asked-questions-faqs-about-ferc (last visited Nov. 5, 2021).

[81] *Id*.

In addition to the above sweeping duties, FERC also conducts various administrative duties under Part III of the Federal Power Act.[82] Today, the Commission reviews certain mergers, acquisitions, and corporate transactions of public utilities; issues and enforces mandatory reliability standards; monitors and investigates electricity markets; administers accounting and financial reporting regulation; authorizes facilities at international boundaries; and can order refunds on sales when federal marketing administrations sell at rates above the "just and reasonable" threshold.[83]

c. A Shift Toward Competitive & Open Access Wholesale Markets

Since the late 1970's there has been "a trend toward lighter-handed regulation and more reliance on competition and markets across multiple sectors of the economy, including . . . electricity."[84] This trend originated in the 1970's[85] and was motivated by the belief among policymakers that market competition could produce public benefits.[86] By the late 1990s, "[a]s competition seeped into the electricity markets, FERC responded by embracing markets as a useful tool for ensuring just and reasonable rates."[87]

i. The Public Utility Regulatory Act of 1978

In 1977 President Carter presented Congress with a National Energy Plan.[88] The final National Energy Act was adopted as several separate laws, one of which was The Public Utility Regulatory Act of 1978 (hereinafter, "PURPA").[89]

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[82] Van, *supra* note 75.

[83] Mark F. Sundback, Bill Rappolt, Andrew P. Mina, *Electricity Regulation in the United States: overview*, WESTLAW, https://content.next.westlaw.com/8-525-5799?__lrTS=20200906030348052&transitionType=Default&contextData=(sc.Default)&firstPage=true (last visited Nov. 5, 2021).

[84] David B. Spence, *Regulating Competition, both the forest and the trees*, 70 EMORY L. J. ONLINE 13, (2021) (citing William Boyd, *Just Price, Public Utility, and the Long History of Economic Regulation in America*, 35 YALE J. ON REG. 721, 772-75 (2018)).

[85] Hausman & Neufeld, *supra* note 12, at 735-37.

[86] Spence, *supra* note 84 (citing William Boyd, Just Price, Public Utility, and the Long History of Economic Regulation in America, 35 Yale J. On Reg. 721, 772-75 (2018)).

[87] Bethany Davis Noll & Burcin Unel, *Markets Externalities and the FPA* 27 NYU ENVTL. L. J. 1, at 20 (2019).

[88] Hausman & Neufeld, *supra* note 12, at 737.

[89] *Id*.; Klein, *supra* note 43, at 240–41 (stating "In 1978, Congress enacted [PURPA] as one of five statutes . . . under the National Energy Act, which aimed to encourage the development of renewable energy.").

PURPA is largely known for encouraging competition in generation—particularly for renewables and cogeneration.[90] However, PURPA was not *designed* to foster competition.[91] The law was enacted to encourage conservation and efficiency of electric energy in response to the various shocks to the energy industry in the 1970s.[92] It aimed to ensure equitable retail rates for consumers, support expeditious development of hydroelectric potential for small dams, and conserve natural gas.[93] PURPA accomplished these goals by creating a new class of generating facility—Qualified Facilities (hereinafter, "QFs")—and requiring electric utilities to interconnect their systems with QFs sand purchase electricity from them.[94]

A QF is a FERC-approved electric generating facility, falling into one of two categories—*small power producers* or *cogenerators*.[95] Small power producers are the owners or operators of generating facilities with primarily renewable energy sources (*e.g.*, wind or solar), biomass, waste, geothermal, or any combination that, together with any other facilities located at the same site, do not exceed 80 megawatts of production.[96] Cogenerators are owners or operators of generation facilities that produce electric energy for their own use in addition to another form of useful thermal energy and meet size and fuel use efficiency requirements set out by FERC.[97] In practice, PURPA created an exception to PUHCA, allowing some non-utility actors back into the electricity sector.

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[90] The Law Offices of Carolyn Elefant, *Reviving PURPA's Purpose: The Limits of Existing State Avoided Costs Ratemaking Methodologies In supporting Alternative Energy Development and A Proposed Path for Reform*, Report Prepared for Southern Alliance for Clean Energy (Oct. 21, 2011), http://lawofficesofcarolynelefant.com/wp-content/uploads/2012/04/Elefant_Reviving_PURPA_Avoided_Costs_2011.pdf (citing *FERC v. Mississippi*, 456 U.S. 742, 750 (1982)).

[91] William Barry, *Competition in the Electric Industry: The Influence of PURPA, PUHCA, and Transmission Access*, 6 AM. BAR ASS'N, NAT. RES. & ENV'T. 2, at 32-33 (1991).

[92] FEDERAL ENERGY REGULATORY COMMISSION, PURPA QUALIFYING FACILITIES, https://www.ferc.gov/qf (last visited Nov. 5, 2021).

[93] *Id*.

[94] FERC, *supra* note 92; Public Utility Regulatory Policies Act of 1978, Pub. L. No. 111-5, § 210(a) (2009) (codified as amended at 16 U.S.C. § 824a-3).

[95] FERC, *supra* note 92; SOLAR ENERGY INDUSTRIES ASSOCIATION, *PURPA 101: The Public Utility Regulatory Policies Act of 1978*, *https://www.seia.org/sites/default/files/2018-06/SEIA-PURPA-101-Factsheet-2018-April.pdf* (last visited Nov. 5, 2021).

[96] SOLAR ENERGY INDUSTRIES ASSOCIATION, *supra* note 93; 16 U.S.C. § 796 (17) and (18).

[97] *Id*.

Section 210 of PURPA governs electric utility purchases of electric energy from QFs.[98] It requires that electric utilities pay QFs the incremental cost of purchasing alternative electric energy, also referred to as the "avoided cost."[99] In other words, the electric utility must pay the QF for electric energy purchased at a rate that does not exceed what it would have paid to purchase or generate the same electricity from another source.[100] "Congress imposed incremental cost as a ceiling on QF rates to ensure ratepayer[s] . . . would not pay any more for power because the utility purchased from a QF rather than generating the power itself or purchasing from another wholesale source."[101]

In accordance with the FPA, both FERC and the states are responsible for implementing PURPA.[102] FERC established guidelines for what constitutes a QF, adopted regulations that define incremental costs, and developed guidance on avoided costs.[103] Avoided costs, rates, terms, and conditions of power purchase contracts and interconnections are left to state PSC discretion.[104] Thus, in its regulations implementing PURPA, "FERC carve[s] out a small area in which states could set wholesale rates without being preempted by the FPA" so long as the sate-established rate for the QFs' electricity does not exceed the avoided cost ceiling.[105]

"PURPA created . . . a process [that guaranteed] independent power producers . . . access to the utility grid," essentially creating a "utility industry [where] most or all power was produced

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[98] AMERICAN PUBLIC POWER ASSOCIATION, The Public Utility Regulatory Policies Act of 1978, https://www.publicpower.org/policy/public-utility-regulatory-policies-act-1978, (last visited Nov. 5, 2021).

[99] PURPA § 210 (b - d) (codified at 16 U.S.C. § 824a-3).

[100] PURPA § 210 (b - d) (codified at 16 U.S.C. § 824a-3).

[101] The Law Offices of Carolyn Elefant, *supra* note 90 (citing FERC Notice of Proposed Rulemaking, Administrative Determination of Avoided Costs, Rates for Sales of Power to Qualifying Facilities, and Interconnection Facilities, Docket No. RM88-6-00; IV F.E.R.C. Statutes and Regulations (CCH) para. 32,457 (1988).

[102] AMERICAN PUBLIC POWER ASSOCIATION, *supra* note 98. FERC has sole authority over wholesale sales of electricity such that when an electricity generator sells its electricity to a public utility intending to resell the electricity to a consumer, FERC has authority over setting rates for that sale. Title 16 U.S.C. § 824d(a) establishes the requirement for "just and reasonable" rates while § 824e(a) authorizes FERC to take corrective action against discriminatory rates. States have sole authority to set rates for the sale of electricity from public utilities to end consumers. The problem resulting from this split in federal and state authority over rate setting for electricity sales is that the public utilities will purchase the cheapest electricity available, and new technologies are usually not cost-effective choices. (Klein, *supra* note 43, at 240–41).

[103] AMERICAN PUBLIC POWER ASSOCIATION, *supra* note 98; The Law Offices of Carolyn Elefant, *supra* note 90 (citing 18 C.F.R. § 292.101(6)).

[104] *Id*.

[105] Klein, *supra* note 43, at 240–41 (citing The Law Offices of Carolyn Elefant, *supra* note 90).

competitively by independently-owned generators feeding a common transmission system from which local distribution systems and large industrial users could obtain electricity."[106] By allowing independent power producers (hereinafter, "IPP") access to the utility grid, PURPA fueled the movement toward competition in electricity markets.[107] Despite the origins of PURPA being rooted in energy conservation and efficiency, PURPA's legacy has been a demonstration that "competition in generation was possible and that non-utility producers would offer ample supplies of new capacity in response to economic incentives."[108]

ii. The 1992 Energy Policy Act

Despite PURPA's impact, opening access to some of the generation market, many electric generators complained that vertically-integrated utilities still gave preference to their own company's assets.[109] As a result, Congress passed the Energy Policy Act (EPAct) in October of 1992 to further encourage "FERC to foster competition in the wholesale energy markets through open access to transmission facilities."[110] The EPAct allowed QFs, other utility generation companies, and IPPs open access to transmission facilities and, in doing so, created a new structure of competition in the wholesale electric generation market.[111] Some scholars have noted that the EPAct is a "judgment [by Congress] that the traditional vertically integrated electric utility no longer is the exclusive, or even the preferred, model around which the electricity industry of the future should be structured."[112]

The EPAct created a new class of Independent Power Producers (hereinafter "IPPs") called Exempt Wholesale Generators (hereinafter, "EWGs") that were not bound by PURPA or PUHCA

[106] Hausman & Neufeld, *supra* note 12, at 737.

[107] *Id*.

[108] William Barry, Competition in the Electric Industry: The Influence of …. 1991) PDF on computer…. At 32-33

[109] Chris Blazek, *supra* note 53, at 43-113; 80-84.

[110] Energy Policy Act of 1992, Pub. L. No. 102-486, 106 Stat. 2776, 2915 (1992) (codified at 16 U.S.C. § 824(a)); FEDERAL ENERGY REGULATORY COMMISSION, ELECTRIC COMPETITION, https://www.ferc.gov/industries-data/electric/power-sales-and-markets/electric-competition (last accessed Nov. 5, 2021); Hausman & Neufeld, *supra* note 12, at 738; Linda G. Stuntz, *The Energy Policy Act of 1992: Changing the Electricity Industry, NR& 10* AM. BAR ASS'N, NAT. RES. & ENV'T. 1, at 69-71, 69 (citing National Energy Strategy 30-35 (1st ed. 1991/19 92) for the proposition that the Executive and Legislative branch of government agreed that created competition in generation markets could be achieved by providing relief from PUHCA regulation.)

[111] Chris Blazek, *supra* note 53, at 43-113; 80-84.

[112] Stuntz, *supra* note 110, at 69.

rules.[113] Title VII of the EPAct reformed PUHCA, exempting any person engaged in the exclusive business of owning or operating all or part of an "eligible facility" and selling electric energy at wholesale from regulation by the SEC.[114] Eligible facilities are defined as facilities used for generation of electricity either exclusively for sale at wholesale or leased to one or more public utility companies, provided that a lease is treated as a sale at wholesale for purposes of the FPA §§ 205 and 206.[115]

EWGs are distinct from QFs; they are not required to meet the parameters set out in PURPA to become QFs (cogeneration or renewable provisions), and utilities are not required to purchase power from EWGs.[116] Likewise, EWGs are ineligible for "avoided cost" rates offered to QFs under PURPA.[117] Instead, EWGs charge and receive market-based rates for their electricity.[118] The EPAct of 1992 created another exception from PUHCA, allowing non-utility participation in the generation sector of the electricity sector.

The EPAct charged FERC with establishing rules that require transmission owners to provide transmission access upon the request of wholesale customers, also known as "wheeling."[119] Wheeling occurs when a transmission utility owner allows another electric power producer to transfer (wheel) electricity across its transmission lines.[120] The Commission's authority over wholesale wheeling was one of the most noteworthy impacts of the EPAct—it provided nationwide open-access to the electric transmission grid.[121] "[I]t provided rural cooperatives and municipal utilities access to new generators (EWGs and qualifying facilities) in distant wholesale markets, freeing them from their dependency on surrounding investor-owned [vertically-integrated] utilities for their wholesale power requirements."[122]

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[113] Hausman & Neufeld, *supra* note 12, at 738; 15 U.S.C. §§ 79z-6, 79z-5a.

[114] Stuntz, *supra* note 110, at 69; 15 U.S.C. § 79z-5a.

[115] *Id*. (citing 15 U.S.C. § 79z-5a)

[116] Chris Blazek, *supra* note 53, at 80-84; 16 U.S.C. § 2621.

[117] *Id*.

[118] *Id*.

[119] 16 U.S.C. § 824j; Stuntz, *supra* note 110, at 69; Chris Blazek, *supra* note 53, at 80-84.

[120] Chris Blazek, *supra* note 53, at 80-84.

[121] Chris Blazek, *supra* note 53, at 80-84.

[122] Chris Blazek, *supra* note 53, at 80-84*;* Hausman & Neufeld, *supra* note 12, at 738.

The Commission was also charged with defining the "just and reasonable" rate for transmission in the wholesale market.[123] When approving rates, the EPAct directs FERC to permit a utility to recover all legitimate and verifiable economic costs incurred in connection with the transmission services, including an appropriate share of necessary associated services, like the enlargement of transmission facilities.[124]

The EPAct left a lasting impact on electric utility energy efficiency and conservation practices.[125] While a less discussed result of the EPAct, this impact was influential—it requires electric utilities develop integrated resource plans (IRPs), file them with the state PSC, allow for intervenor input and testimony as well as public involvement, and implement the plan.[126] The IRP process is the "[w]idely-accepted" method for generation resource planning, which compares the life-cycle costs of different resources in order to select the most economic incremental resource base.[127] Because utility companies must obtain a certificate of public convenience and necessity (CPCN) to construct new generation facilities, IRPs can help PSCs evaluate new generation resources.[128] IRPs include state legislatively created Portfolio Standards, such as Renewable Energy Standards and Energy Efficiency Resource Standards; thus, IRPs must be inclusive of at times divisive state policies across their territorial service areas.[129]

Energy conservation and efficiency is also encouraged at the asset level by the EPAct.[130] The EPAct requires consideration of the disincentives caused by existing ratemaking policies and potential incentives that encourage better maintenance and investment in more efficient power equipment.[131] The EPAct also created the renewable electricity production tax credit (hereinafter, "PTC"), the Investment tax credit (hereinafter, "ITC"), and the Renewable Energy Production

[123] 16 U.S.C. § 824k; Hausman & Neufeld, *supra* note 12, at 738; Stuntz, *supra* note 110, at 69.

[124] Chris Blazek, *supra* note 53, at 80-84.

[125] *Id*.

[126] *Id*.

[127] U.S. EPA, *supra* note 10.

[128] U.S. EPA, *supra* note 10.

[129] U.S. EPA, *supra* note 10.

[130] Chris Blazek, *supra* note 53, at 80-84.

[131] Chris Blazek, *supra* note 53, at 80-84.

Incentive (hereinafter, "REPI").[132] The PTC is a ten-year, inflation adjusted federal income tax credit awarded if certain conditions are met on a per-kilowatt-hour basis for electricity generated by defined types of renewable energy sources.[133] The ITC is a tax credit that awards owners of qualifying energy projects a percentage of their project's capital costs, but if the project is sold within five years of operation, the credit is reduced proportionally.[134] Private project owners may choose to claim either the PTC or the ITC, but high capital costs tend to make ITCs more appealing, whereas high amounts of electricity generation or knowing the project will be sold within five years may make the PTC more appealing.[135] The REPI is a program that provides financial incentive payments to non-privately-owned utilities (cooperatives, municipally-owned, and governmentally owned utilities) for generating and selling electricity from specified renewable facilities.[136]

Soon after the EPAct was passed, it became apparent that further guidance was needed to facilitate the transition to more competitive generation markets.[137] Vertically integrated utilities found themselves in an "untenable" position—they were the only generator in a newly competitive generation market required to purchase power from QFs under PURPA, while other independent generators, like EWGs, could now compete for the utility's customers and were not bound by the same requirements.[138]

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[132] THOMPSON REUTERS PRACTICAL LAW, Glossary, Navigate to "Production Tax Credit" and "Investment Tax CREDIT", https://uk.practicallaw.thomsonreuters.com/Glossary/PracticalLaw?docGuid=I03f4d8caeee311e28578f7ccc38dcbee&transitionType=DocumentItem&contextData=(sc.Default) (last visited Sept. 7, 2021); U.S. EPA WEB ARCHIVE, https://archive.epa.gov/epawaste/hazard/wastemin/web/html/rpsinc.html#:~:text=The%20Renewable%20Energy%20Production%20Incentive,new%20qualifying%20renewable%20energy%20facilities (last visited Sept. 7, 2021).

[133] Chris Blazek, *supra* note 53, at 92–93; U.S. EPA, RENEWABLE ELECTRICITY PRODUCTION TAX CREDIT INFORMATION, https://www.epa.gov/lmop/renewable-electricity-production-tax-credit-information#:~:text=The%20PTC%20provides%20a%20corporate,(150%20kW%20or%20larger) (last visited Sept. 7, 2021); THOMPSON REUTERS, *supra* note 132.

[134] THOMPSON REUTERS, *supra* note 132.

[135] *Id*.

[136] *Id*.; U.S. EPA WEB ARCHIVE, *supra* note 132.

[137] Chris Blazek, *supra* note 53, at 80-84.

[138] Stuntz, *supra* note 110 at 69-71, 87.

In addition to this problem, issues arose regarding the operation and regulation of the transmission system.[139] The Commission realized the transmission grid would need to be operated by either the government or a private company subject to regulation to ensure electricity was supplied in an efficient, safe, and reliable manner, while also ensuring competition and open access.[140] Even after FERC released a series of policy statements intended to clarify its policies and avoid litigation, open and non-discriminatory transmission access did not exist universally.[141] In response, FERC issued orders 888 and 889, which were considered highly "ambitious" and "far-reaching" rulings at the time.[142]

iii. FERC Orders 888 & 889

In 1996, FERC issued Orders 888 and 889. Order 888 requires each electric utility that owns, controls, or operates interstate transmission facilities to have on file with FERC an open-access, nondiscriminatory transmission tariff.[143] Tariffs streamlined the process for wheeling requests, eliminating FERC's case-by-case evaluation and allowing companies the ability to participate in live, short-term markets.[144]

Order 888 permitted electric utilities to seek recovery of stranded costs associated with providing open access to their transmission lines as well as other stranded costs not recouped due to opening access to competitive-generation markets.[145] Stranded costs represent the electric utility's capital investments that were not recovered due the transition to competition.[146] This recovery provision was pivotal to the restructuring movement in electricity markets and fostered cooperation among industry participants.[147] The Commission required that wholesale stranded

[139] Hausman & Neufeld, *supra* note 12, at 738.

[140] *Id*.

[141] Chris Blazek, *supra* note 53, at 80-84.

[142] *Id*.

[143] *Id*. at 84-87; Recovery of Stranded Costs by Public Utilities and Transmitting Utilities, 75 FERC ¶ 61,080 (1996) "Order No. 888".

[144] Chris Blazek, *supra* note 53, at 80-87.

[145] *Id*.

[146] *Id*.

[147] *Id*.

costs be assigned to the departing wholesale customer, usually a regulated utility.[148] Thus, these costs could be recovered in rates set by PSCs.

Order 888 also required all interstate transmission owners to functionally unbundle their activities and separate their rates for wholesale generation and ancillary services, effectively equalizing the standard for competition in the market.[149] This move virtually eliminated the vertically integrated utility as it was formerly known by separating transmission services and functions from other business activities in the company.[150] The Order defines six ancillary services as part of the tariff, with the customer required to purchase the first two from the transmission provider: "Scheduling, system control, and dispatch; reactive supply and voltage control from generation sources; regulation and frequency response; energy imbalance; operating reserve—spinning reserve, operating reserve—supplemental reserve."[151]

In 1993, FERC issued a policy statement encouraging transmission owners, operators, and customers to form regional transmission groups that would coordinate transmission planning and expansion on a regional basis.[152] At the time, very few regions established regional transmission operators.[153] As a result in Order 888, FERC encouraged formation of independent system operators (hereinafter, "ISOs")[154] to assume the role of transmission operations from utilities that were unbundling their transmission activities.[155] Utilities would retain ownership over their transmission assets with ISOs serving as a third party operator of the transmission system. ISO's ensure fair and open-access transmission, eliminate discriminatory practices, and facilitate

[148] *Id*.

[149] *Id*.

[150] *Id*.

[151] *Id*.

[152] *Id*.

[153] *Id*.

[154] 16 U.S.C.A. § 796(28)(A) and (B). "The term 'Independent System Operator' or 'ISO' means an entity approved by the Commission-- to exercise operational or functional control of facilities used for the transmission of electric energy in interstate commerce; and to ensure nondiscriminatory access to the facilities." FERC ORDER 888.

[155] Chris Blazek, *supra* note 53, at 80-87.

efficient operation and control of the transmission grid because they do not profit from marketing and selling power.[156] However, participation in an ISO was voluntary.[157]

Order 889 established the open-access, same-time information system (OASIS), which is an interactive internet-based database that tracks information about available transmission capacity, capacity reserves, ancillary services, and transmission prices.[158] OASIS facilitates the operation of the competitive generation market.[159] Importantly, the Order required interstate transmission owning utilities participate in OASIS, thereby providing unrestricted timely and accurate day-to-day information about transmission to all transmission users.[160] Power marketers that sign an open access tariff have complete access to transmission requests, service requests from other parties, and service availability.[161]

Limitations on transmission exist to ensure reliability, safety, and capacity planning. Transmission operators analyze system operation in various future time periods to identify how much transfer capacity is needed for "native load" and how much buffer capacity should exist for unplanned overflows or shortages.[162] OASIS nodes provide this data for purchase and each transmission rate carries a different cost structure.[163] "Nodes" are "Internet-based interfaces to each transmission system's market offerings and availability announcements."[164]

Despite Orders 888 and 889, four major obstacles to open access transmission still remained: (1) transmission owners continued to discriminate against independent power companies but the behavior became harder to identify because of the increase in market participation; (2) the functional unbundling of utility-company activities was not sufficient, which further contributed to discriminatory behavior; (3) voluntary ISO formation was slow to occur; and (4) grid reliability, congestion, and capacity became hard to manage and forecast due to the

[156] *Id*.

[157] *Id*.

[158] *Id*.

[159] *Id*.

[160] *Id*.

[161] *Id*.

[162] *Id*.

[163] *Id*.

[164] *Id*.

increase in market participation and lack of regional operation.[165] On top of these challenges, customers faced additional prices every time power crossed the border of a transmission owner (referred to as pancake pricing), which reduced the size of the competitive markets the Commission was trying to incentivize.[166]

iv. The State-Level Restructuring Movement of the 1990s

Concurrent with federal efforts, a parallel movement towards competition ensued at the state level.[167] States began to restructure[168] their electricity sector to increase competition in retail markets.[169] The restructuring movement further encouraged breaking up the vertically integrated structure of utility companies to allow for more competition in retail sales of electricity and generation to better serve customers.[170]

Restructured states required utilities to divest from their generation assets.[171] This allowed more generators to enter the market and compete for sales.[172] In restructured states, electricity is traded between generators and suppliers.[173] Restructuring was extremely popular, "by 2001 all but eight states had passed, or were . . . considering, restructuring of some form."[174]

California was the first state to require divestment.[175] The state passed legislation requiring utilities to divest from their generation activities, and establishing the California Independent

[165] *Id*.

[166] *Id*.

[167] Hausman & Neufeld, *supra* note 12, at 738; U.S. EPA, *supra* note 10, at 1. The EPAct prohibited FERC from ordering retail wheeling to end-use customers, but states began to restructure their electricity sector to increase competition in retail markets themselves. *Chris Blazek, supra* note 53, at 81.

[168] Sometimes this is referred to as the "deregulation" movement but the term "deregulation" can be misleading. The restructuring movement was a change in the way regulators oversaw the industry rather than a shift away from regulation altogether. Hausman & Neufeld, *supra* note 12, at 740.

[169] U.S. EPA, *supra* note 10, at 1.

[170] Hausman & Neufeld, *supra* note 12, at 740.

[171] Christiansen & Macey, *supra* note 27, at 1375 (citing Mathew J. Morey & Laurence D. Kirsch, Christensen Assocs. Energy Consulting LLC, Retail Choice in Electricity: What Have We Learned in 20 Years?, at 1, 20 (2016)).

[172] *Id*.

[173] U.S. EPA, *supra* note 10.

[174] Hausman & Neufeld, *supra* note 12, at 740 (citing US Energy Information Administration, 2005; Blumstein, Friedman, & Green, 2002, p. 18).

[175] *Id*.

System Operator (CAISO), which would operate and maintain the transmission grid, and the Power Exchange (PX), which would "act as a clearing house for daily and hourly markets and to establish process for a day ahead market based on bids from market participants."[176] Problems developed with CAISO's rules, and this led to skyrocketing wholesale prices.[177] Price spikes were initially quelled by regulatory changes, but were ultimately insufficient to relieve the extreme fluctuations the wholesale market saw from 2000 to 2001.[178] Utilities were forced to buy electricity from a volatile competitive market, and to sell electricity in a PSC price-capped regulatory retail market.[179]

In hindsight it became clear that the competitive market was volatile primarily because companies involved in generation artificially created the appearance of transmission congestion (so it appeared that there was not enough transmission capacity to deliver electricity without exceeding thermal, voltage, and stability limits).[180] The appearance of congestion forced utilities to purchase extremely expensive electricity to avoid the apparently congested area.[181] Many reputable utility companies declared bankruptcy, CAISO became insolvent, the PX ceased to operate, and rolling blackouts ensued, causing economic hardship and panic among the states following in California's footprints.[182] The state of California eventually became the sole purchaser of electric power, spending over $1 billion per month.[183]

Even though the main reason for the crisis in California was due to market manipulation, many states were deterred by California's energy crisis.[184] "Between 2001 and 2003, electric utility restructuring was suspended in 26 states."[185]

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[176] *Id*.

[177] *Id*.

[178] *Id*.

[179] *Id*.

[180] *Id*.

[181] *Id*.

[182] *Id*.

[183] *Id*.

[184] *Id*.

[185] *Id*.

Some state PSCs also started to allow retail choice. More generators were able to enter the market and they were able to compete for sales from end-use consumers, who now could select from different electricity providers.[186] In states with retail choice, the distribution system still operates as a natural monopoly over its service area, but consumers may choose to purchase their electricity from any generator, which is usually marketed and sold by energy marketers.

v. FERC Order 2000

In December of 1999, FERC issued Order 2000.[187] The Order requested all transmission-owning utilities[188] *voluntarily* place their transmission facilities under the control of regional transmission organization (hereinafter, "RTO").[189] It was an effort by FERC to move the transmission system away from a vertically-integrated ownership structure and towards a system controlled by an unaffiliated neutral organization.[190]

Order 2000 defined the characteristics and functions of RTOs and established a collaborative process for RTO formation.[191] It required that RTOs were independent from market participants, listing specific criteria.[192] RTOs also had to be of "sufficient scope" to perform their functions. Criteria was provided to define sufficient scope, including: facilitate performance of essential functions; encompass a contiguous area with a highly interconnected portion of the grid along with its regional transmission entities and control areas; deter the exercise of market power; recognize existing trading patterns; and account for regional and international boundaries.[193] RTOs

[186] Christiansen & Macey, *supra* note 27, at 1375.

[187] Chris Blazek, *supra* note 53, at 87-92; REGIONAL TRANSMISSION ORGANIZATIONS, Order No. 2000, 89 FERC ¶ 61,285 (1999), https://www.ferc.gov/sites/default/files/2020-06/RM99-2-00K_1.pdf [hereinafter Order No. 2000]. For the purposes of this Article, "RTO" is used to refer to both ISOs and RTOs, unless a specific designation is intended.

[188] Order 2000 did not apply to municipally-owned, cooperatively owned, and federally owned utilities. Chris Blazek, *supra* note 53, at 87-92.

[189] 16 U.S.C.A. § 796(27)(A) and (B). "The term 'Regional Transmission Organization' or 'RTO' means an entity of sufficient regional scope approved by the Commission-- to exercise operational or functional control of facilities used for the transmission of electric energy in interstate commerce; and to ensure nondiscriminatory access to the facilities." Order no. 2000, *supra* note 187; EUCI, ELECTRICITY MARKETS EVENTS, https://www.euci.com/electric/markets/ (last visited Sept. 7, 2021); Chris Blazek, *supra* note 53, at 87-92.

[190] Chris Blazek, *supra* note 53, at 87-92.

[191] *Id*.

[192] *Id*.

[193] *Id*.

were tasked with ensuring real-time and short-term reliability of the transmission grid, so the Commission also required that RTOs had operational authority for all transmission facilities under their control.[194]

The Commission retained authority over transmission rates, and rates were required to address: pancake pricing, access charges between RTOs, uniform access charges, congestion pricing, servicing for transmission utilities that do not participate in an RTO, performance regulations, rate reforms and rate-making issues, and filing procedures.[195]

While Order 2000 was voluntary, it did contain certain provisions that required transmission utilities to take steps toward becoming part of an RTO.[196] Transmission utilities were required to submit a proposal to participate or description of efforts made to participate in an RTO, specifying obstacles, plans, and timelines.[197] If a transmission utility was already a member of an ISO, it was required to describe the extent to which the ISO conformed with the characteristics and functions of an RTO and obstacles, efforts and plans to conform to an RTO's minimum characteristics and functions.[198] After Order 2000, ISOs and RTOs became distinguishable in name only.[199] Thus, this Article uses the term RTO.

In Order 2000, FERC recognized issues that might prevent formation of RTOs.[200] One of the most impactful issues was the matter of non-investor-owned utilities. The Commission acknowledged that while it expected publicly-owned power entities, federally-owned power entities, and cooperatively-owned entities to participate in forming RTOs, they may face obstacles.[201] Primarily, they are "non-jurisdictional" utilities; FERC has no leverage to obtain their participation.[202] The Internal Revenue Service codes could also prevent facilities financed by tax-exempt debt from wheeling privately-owned power over their transmission lines, or the transfer of

[194] *Id*.

[195] *Id*.

[196] *Id*.

[197] *Id*.

[198] *Id*.

[199] *Id*.

[200] *Id*.

[201] *Id*.

[202] *Id*.

operational control of transmission facilities, financed by tax-exempt debt, to a for-profit transmission company (like an RTO).[203] Additionally, state and local laws may prohibit public power entities from participating in RTOs.[204]

d. Recent Regulatory Evolution

i. The 2005 Energy Policy Act

Passage of the Energy Policy Act of 2005 (hereinafter, "EPAct 2005") had significant impacts on the electric industry.[205] Transmission congestion had become an impediment to the reliable and efficient operation of competitive markets.[206] In response, the EPAct 2005 added § 219 to the FPA, mandating that the Commission "establish, by rule, incentive-based (including performance-based) rate treatments for the transmission of electric energy in interstate commerce . . ."[207] In addition, the EPAct 2005 required the Secretary of the DOE to identify areas of congestion where lines crossed two or more state boundaries.[208] In these areas—and despite the fact that transmission siting and eminent domain authority was historically left to states—proposed transmission project developers could petition FERC to exercise federal eminent domain authority to acquire rights of way and construct new transmission facilities.[209] The EPAct 2005 has begun to muddle the FPA's bright line, previously erected between state and federal jurisdiction over electricity systems.

Congress further addressed transmission issues by granting FERC authority to approve incentive rates for the construction of transmission facilities.[210] Finally, EPAct 2005 created a loan

[203] *Id*.

[204] *Id*.

[205] *Id*. at 43-113, 92-93; 42 U.S.C. § 13201 et seq. (2005).

[206] Chris Blazek, *supra* note 53, at 92-93.

[207] T&D WORLD, *Before FERC Order 1000 There Was Order 679 - $53bn and Counting*, https://www.tdworld.com/overhead-transmission/article/20969754/before-ferc-order-1000-there-was-order-679-53bn-and-counting#:~:text=Driven%20by%20the%20new%20policy,pre%2Dcommercial%20and%20abandoned%20plant (last visited Sept. 7, 2021); 16 U.S.C. § 824s (a).

[208] Chris Blazek, *supra* note 53, at 92-93.

[209] *Id*.

[210] *Id*.

guarantee program housed within DOE to provide support for technologies focused on transmission efficiency.[211]

The EPAct 2005 also broadened support for renewable generation. It extended and modified the tax credits and incentives available to both privately-owned utility companies (the PTC, the ITC) and non-privately owned utility companies (the REPI) originally created in EPAct 1992.[212] Both PUHCA and PURPA were also amended with passage of EPAct 2005.[213]

Under the amended provisions of PURPA, utilities operating in the competitive generation market were no longer required to purchase electricity from QFs if FERC finds the QF generates more than 20 megawatts and has non-discriminatory access to certain categories of wholesale markets.[214] The EPAct 2005 retained the mandatory purchase requirement for QFs that generate less than 20 megawatts per hour, even within competitive markets.[215] While the EPAct of 2005 also codified net metering in its amendments to PURPA, the net-metering "requirement" is often referred to as having "no teeth" due to its provisions requiring consideration and not compliance by state implementing bodies.[216]

The EPAct 2005 repealed PUHCA of 1935 and enacted a revised 2005 PUHCA.[217] Utilities were no longer subject to SEC regulation; instead, the Commission's authority over electric utilties was broadened.[218] Utilities were required to provide additional data from books and records to

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[211] *Id*.

[212] Chris Blazek, *supra* note 53, at 92-93; U.S. EPA WEB ARCHIVE, *supra* note 132.

[213] Chris Blazek, *supra* note 53, at 92-93; SOLAR ENERGY INDUSTRIES ASSOCIATION, PURPA 101 THE PUBLIC UTILITY REGULATORY POLICIES ACT OF 1978, https://www.seia.org/sites/default/files/2018-06/SEIA-PURPA-101-Factsheet-2018-April.pdf (last visited Sept. 7, 2021); AMERICAN PUBLIC POWER ASSOCIATION, PUBLIC UTILITY REGULATORY POLICIES ACT OF 1978, https://www.publicpower.org/policy/public-utility-regulatory-policies-act-1978 (last visited Sept. 7, 2021).

[214] SOLAR ENERGY INDUSTRIES ASSOCIATION, *supra* note 213; AMERICAN PUBLIC POWER ASSOCIATION, *supra* note 213.

[215] *Id*.

[216] Lauren Watson, 7 OIL & GAS, NAT. RESOURCES & ENERGY J. 213, *PURPA: Bastion, Bridge, or Bygone? Constitutional and Consumer-Generator Considerations* (2021), at 216-217 (citing 16 U.S.C. § 2621 (including the amendments made by the act)).

[217] Repeal of the Public Utility Holding Company Act of 1935 and Enactment of the Public Utility Holding Company Act of 2005, 70 Fed. Reg. 75592 (Dec. 20, 2005) (to be codified at 18 C.F.R. pts. 365 and 366), https://www.federalregister.gov/documents/2005/12/20/05-24116/repeal-of-the-public-utility-holding-company-act-of-1935-and-enactment-of-the-public-utility-holding.

[218] Chris Blazek, *supra* note 53, at 57-58.

FERC, which would help FERC mitigate a utility's potential to manipulate the market or to comingle utility and non-utility activities.[219] It became FERC's responsibility to review loans and other utility encumbrances and assess financial risk in the instance of acquisition.[220]

The EPAct 2005 initiated significant changes to electricity regulation, primarily by broadening FERC's responsibilities.[221] Specific to electricity regulation, FERCS's new responsibilities included: reviewing mergers, acquisitions, and corporate transactions by electric companies; ensuring the reliability of interstate transmission systems by maintaining reliability standards; monitoring and investigating energy markets; enforcing its regulations by imposing civil penalties; and administering financial reporting for regulated companies.[222]

ii. FERC Orders: 2006 – Present

Order 670

The Commission passed Order 670 in January of 2006 to implement § 222 of the FPA, which prohibited market manipulation. This section makes it "unlawful for any entity . . . to use or employ, in connection with the purchase or sale of electric energy or . . . transmission services . . . any manipulative or deceptive device or contrivance . . . "[223] The order sets out the legal parameters to bring a market manipulation claim under § 222 of the FPA.[224]

Order 890

The Commission issued Order 890 in February of 2007.[225] It amended regulations previously set forth in Orders No. 888 and 889 regarding open access transmission tariff.[226] These regulations were amended to "ensure that transmission services are provided on a basis that is just,

[219] *Id*.

[220] *Id*.

[221] FEDERAL ENERGY REGULATORY COMMISSION (FERC), WHAT FERC DOES, https://www.ferc.gov/about/what-ferc/what-ferc-does (last visited Sept. 7, 2021).

[222] *Id*.

[223] 16 U.S.C. § 824v.

[224] FEDERAL ENERGY REGULATORY COMMISSION (FERC), 18 C.F.R. Part 1c (2006) (Prohibition of Energy Market Manipulation, "Order 670"), https://cms.ferc.gov/sites/default/files/2020-04/20060119-3053%2814582422%29.pdf.

[225] FERC, Preventing Undue Discrimination and Preference in Transmission Service, 18 C.F.R. Parts 35 and 37 (2007) ("Order 890"), https://www.ferc.gov/sites/default/files/2020-05/E-1fr890.pdf.

[226] *Id*.

reasonable and not unduly discriminatory or preferential."[227] The rule strengthens the open-access transmission tariff (hereinafter, "OATT"), provides greater specificity to reduced undue discrimination, and increases transparency in rules regarding planning and use of the transmission system.[228]

Order 719

In response to the need for enhanced operation of the wholesale electric market, the Commission issued Order 719 in October of 2008.[229] This order amends FERC's regulations under the FPA to improve: "(1) demand response and market pricing during periods of operating reserve shortage; (2) long-term power contracting; (3) market-monitoring policies; and (4) the responsiveness of [RTOs] to their customers and other stakeholders, and ultimately to the consumers who benefit from and pay for electricity services."[230] To accomplish these changes, FERC required each RTO file proposed amendments to their tariffs that would ensure compliance with the new regulations or demonstrate that their existing tariff already complies.[231]

Order 841

Energy storage will likely become an additional aspect and market of electricity systems;[232] it has potential to provide economic and environmental benefits, depending on the method of storage and the extent of deployment.[233] Storage occurs in a number of ways, some examples include: Pumped hydroelectric storage, compressed air storage, flywheels, batteries, thermal energy storage, as well as new technologies currently under development, such as flow batteries, super capacitors, and superconducting magnetic energy storage.[234]

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[227] *Id*.

[228] *Id*.

[229] FERC, 18 C.F.R. Part 35 (2008) (Wholesale Competition in Regions with Organized Electric Markets, "Order 719"), https://cms.ferc.gov/sites/default/files/2020-04/E-1%281%29.pdf.

[230] *Id*.

[231] *Id*.

[232] U.S. EPA, ELECTRICITY STORAGE, ABOUT ELECTRICITY STORAGE, https://www.epa.gov/energy/electricity-storage (last visited Sept. 7, 2021).

[233] *Id*.

[234] *Id*. Pumped hydroelectric storage uses electricity to pump water up to a reservoir; when the water is released it flows down through a turbine that generates electricity. Compressed air storage uses electricity to compress air at up

Electricity storage, though not yet deployed at large scale, is likely to facilitate grid resilience. This is because the "electric power grid operates based on a delicate balance between supply (generation) and demand (customer use)" and "[o]ne way to help balance fluctuations in electricity supply and demand is to store electricity during periods of relatively high production and low demand, then release it back to the electric power grid during periods of lower production or higher demand."[235]

FERC issued Order 841 in February of 2018 pursuant to its authority under § 206 of the FPA.[236] It allows electric storage resource participation "in the capacity, energy, and ancillary service markets operated by [RTOs]."[237] To accomplish this, FERC required RTOs to revise their tariffs and create a participation model.[238] The model must specify that a sale of electric energy from the RTO market to an electric storage resource that is then sold back the RTO market must be at the wholesale locational marginal price.[239] The model must also:

> (1) ensure that a resource using the participation model is eligible to provide all capacity, energy, and ancillary services that the resource is technically capable of providing in the [RTO] markets;
>
> (2) ensure that a resource using the participation model can be dispatched and can set the wholesale market clearing price as both a wholesale seller and wholesale buyer consistent with existing market rules;
>
> (3) account for the physical and operational characteristics of electric storage resources through bidding parameters or other means; and

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to 1,000 pounds per square inch and stores the air in underground caverns; the pressurized air is released to generate electricity through an expansion turbine generator. Flywheels use electricity to accelerate a flywheel, which conserves energy as kinetic rotational energy; the spinning force of the flywheel is used to turn a generator to create electricity. Batteries for electricity storage are much larger than common rechargeable batteries, and use lithium ion, lead acid, lithium iron, or other technologies to store energy. Thermal energy storage uses electricity to produce chilled water or ice in times of low demand and is later used for plant cooling during peak electricity consumption. (*Id*.).

[235] *Id*.

[236] FERC, 18 C.F.R Part 35 (Electric Storage Participation in Markets Operated by Regional Transmission Organizations and Independent System Operators, "Order 841) (2018), https://www.ferc.gov/media/order-no-841.

[237] *Id*.

[238] *Id*.

[239] *Id*.

(4) establish a minimum size requirement for participation in the [RTO] markets that does not exceed 100 kW.[240]

Order 872

The commission issued Order 872 on July of 2020[241] and Order 872-A, reiterating and clarifying its findings in Order 872, on November of 2020.[242] The Commission issued Order 872 to fulfil its statutory obligation under § 201 and 219 of PURPA[243] due to the nation's changing energy markets.[244] The order granted flexibility to state PSCs when "establishing avoided cost rates for qualifying facilities' (QF) sales inside and outside of the organized electric markets[and gave PSCs] the ability to require that energy rates, but not capacity rates, vary during the term of a QF contract."[245]

The Order also modified the "one-mile rule", which is the qualifier for whether generation facilities are considered "at the same site" and thus QFs under PURPA.[246] The rule was modified to allow for utilities, PSCs, and other interested parties to demonstrate that "affiliated small power production facilities [using] the same energy resource and . . . *more than one mile . . . and less than 10 miles apart* . . . are at the same site (with distances one mile or less apart still irrebuttably at the same site and distances 10 miles or more apart irrebuttably at separate sites)."[247]

The Order clarified the definition of "electrical generating equipment" to help ease calculations of the space needed between facilities.[248] Additionally, small facilities seeking QF

[240] *Id*.

[241] FERC, 18 C.F.R. Parts 292 and 37 (Qualifying Facility Rates and Requirements Implementation Issues Under the Public Utility Regulatory Policies Act of 1978, "Order 872") (2020), https://ferc.gov/sites/default/files/2020-07/07-2020-E-1.pdf.

[242] FERC, 18 C.F.R. Parts 292 (Qualifying Facility Rates and Requirements Implementation Issues Under the Public Utility Regulatory Policies Act of 1978, "Order 872-A") (2020), https://www.ferc.gov/media/order-no-872.

[243] 16 U.S.C. § 796(17)-(18), § 824a-3.

[244] FERC Order 872-A, *supra* note 242; FERC Order 872, *supra* note 241.

[245] FERC, *FERC Affirms, Clarifies PURPA Final Rule*, https://www.ferc.gov/news-events/news/ferc-affirms-clarifies-purpa-final-rule#:~:text=final%20rule%20itself.-,Order%20No.,of%20the%20organized%20electric%20markets.&text=The%20PURPA%20section%20210(m,of%20nondiscriminatory%20access%20to%20markets (last visited Sept. 7, 2021).

[246] FERC Order 872-A, *supra* note 242.

[247] *Id*.

[248] *Id*.

status were given further opportunities to identify factors that affirm it is a separate site from another QF.[249]

The Commission revised its regulations implementing § 210(m) of PURPA, which provides for the termination of an electric utility's obligation to purchase from a QF if it has nondiscriminatory access to certain markets.[250] The threshold for the rebuttable presumption that certain small QFs may not have nondiscriminatory access to such markets was lowered from 20 megawatts to 5 megawatts, and the Commission provided a nonexclusive list of factors that a QF could use to support that it lacks nondiscriminatory access.[251]

After the recent change in administration this year, FERC's new Chair Commissioner, Richard Glick, dissented in part from Order 872 stating that "it effectively guts the Commission's implementation of the Public Utility Regulatory Policies Act (PURPA)."[252] It remains to be seen whether FERC will modify PURPA implementation or retain the current regulations in Order 872.

Order 2222

Distributed energy resources (hereinafter, "DERs") have emerged in the past few decades and are classified as both type of generation and a form of storage. DERs are typically smaller scale than traditional generation facilities yet still contribute to the overall supply of electricity.[253] A DER "is any resource on the distribution system that produces electricity[,] . . . is not otherwise included in the . . . [Bulk Electric System,]" and "located solely within the boundary of a distribution utility."[254] For instance, DERs may include generating units at one location, an energy

[249] *Id*.

[250] *Id*.

[251] *Id*.

[252] FERC, *Commissioner Richard Glick Dissent in Part Regarding Qualifying Facility Rates and Requirements Implementation Issues Under the Public Utility Regulatory Policies Act of 1978*, https://www.ferc.gov/news-events/news/commissioner-richard-glick-dissent-part-regarding-qualifying-facility-rates-and (last visited Sept. 7, 2021) (citing Pub. L. No. 95-617, 92 Stat. 3117 (1978)).

[253] INDEPENDENT ELECTRIC SYSTEM OPERATOR (IESO), Ontario's Power System, Distributed Energy Resources, https://www.ieso.ca/en/Learn/Ontario-Power-System/A-Smarter-Grid/Distributed-Energy-Resources (last visited Sept. 7, 2021).

[254] North American Electric Reliability Corporation (NAERC), *Distributed Energy Resources Connection Modeling and Reliability Considerations*, 1 (2017), https://www.nerc.com/comm/Other/essntlrlbltysrvcstskfrcDL/Distributed_Energy_Resources_Report.pdf.

storage facility, or a microgrid.[255] Thus, DERs may include behind-the-meter (hereinafter, "BTM") and front-of-the-meter (hereinafter, "FTM") systems. Electric meters serve as the demarcating line between FTM and BTM systems.[256] BTM systems provide electricity that can be used on-site without passing through a household or residence meter; whereas, FTM systems provide electricity that must pass through an electric meter before electricity use.[257]

The Commission issued Order 2222 in September of 2020, enabling DER aggregators to compete in all regional organized wholesale electric markets operated by RTOs alongside traditional resources.[258] The order was passed by FERC to enhance competition, encourage innovation, and reduce costs for customers.[259] It builds off of the D.C. Circuit's holding that affirmed FERC's exclusive jurisdiction over wholesale markets as well as the criteria for participation.[260]

The rule requires RTOs to revise their tariffs to establish DER aggregators as a type of participant, permitting aggregation with other DERs in order to satisfy minimum size and performance requirements and allowing registration of resources under participation models.[261] While the order prohibits retail regulatory authorities from broadly excluding DERs from participating in regional markets, it acknowledges retail regulators' authority to prohibit retail customer demand response from being bid into regional markets by aggregators.[262] Thus, regional grid operators are prevented from accepting bids from an aggregation of customers of a small utility unless the relevant retail regulatory authority for that utility allows for participation.[263]

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[255] *Id*.

[256] Scottish Power (SP) Energy Networks, Zero Carbon Communities Hub, *Behind the Meter Electricity Generation*, https://www.spenergynetworks.co.uk/pages/behind_the_meter.aspx (last visited Sept. 7, 2021).

[257] *Id*.

[258] FERC, 18 C.F.R. Part 35, (Participation of Distributed Energy Resource Aggregations in Markets Operated by Regional Transmission Organizations and Independent System Operators, "Order 2222") (2020), https://www.ferc.gov/sites/default/files/2020-09/E-1_0.pdf.

[259] FERC, *FERC Opens Wholesale Markets to Distributed Resources: Landmark Action Breaks Down Barriers to Emerging Technologies, Boosts Competition*, https://www.ferc.gov/news-events/news/ferc-opens-wholesale-markets-distributed-resources-landmark-action-breaks-down (last visited Sept. 7, 2021).

[260] *Id*.

[261] *Id*.

[262] *Id*.

[263] *Id*.

III. The Regulatory Framework of Today

a. The Bulk Power System

The BPS is divided into four regional networks: The Eastern Interconnection, the Western Interconnection, the Texas Interconnection, and the Quebec Interconnection.[264] The Eastern and Western Interconnections are divided approximately where the Rocky Mountains meet the Great Plains, with each serving their respective regions.[265] While there are physical connections between the Interconnections, each operates independently and very little electricity is exchanged between them.[266] Because the BPS interconnections encompass multiple states and countries, broad regulatory structure with multiple engaged actors is necessary.

In total, the United States electricity system "consists of more than 7,300 power plants, nearly 160,000 miles of high voltage power lines, and millions of low-voltage power lines and distribution transformers, which connect 145 million customers."[267] The resilience and reliability of the electricity system is ensured by redundancy through numerous and diverse generators supplying electricity to load centers.[268] This redundancy works to prevent interruptions in service in the instance of plant failure, extreme weather events, or miscalculations in projected supply or demand.[269]

As a result of the growth in the electricity industry from the 1940s to the 1960s, the electricity industry created the voluntary informal organization, the North American Power Systems Interconnection Committee (NAPSIC) to coordinate the integrated network of

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[264] Western Electricity Coordinating Council (WECC), *The Bulk Power System*, https://www.wecc.org/epubs/StateOfTheInterconnection/Pages/The-Bulk-Power-System.aspx (last visited Sept. 7, 2021). The term "grid" usually includes both the transmission network and the distribution equipment (e.g., lines and transformers) powering a region. Resources for the Future, Electricity 101: Terms and Definitions, https://www.rff.org/publications/explainers/electricity-101/?gclid=Cj0KCQiA9P__BRC0ARIsAEZ6irjlSbDRullachVuzJ9wSB5Cv25eSdzqxzMntRO-ylUl5QLMPNqdyaEaAulPEALw_wcB (last visited Sept. 7, 2021).

[265] WECC, *supra* note 264.

[266] Resources for the Future, *supra* note 264; U.S. Energy Information Association (U.S. EIA), Today in Energy, *U.S. electric system is made up of interconnections and balancing authorities*, https://www.eia.gov/todayinenergy/detail.php?id=27152 (last visited Sept. 7, 2021).

[267] U.S. EIA, *supra* note 266.

[268] *Id*.

[269] *Id*.

transmission and distribution across the United States and Canada—the BPS.[270] At the time, the BPS was the largest system in the world, comprised of the system of generation and transmission facilities in both the United States and Canada.[271] After NAPSIC weaknesses contributed to widespread blackouts across eight states in the late 1960s, Congress established the North American Reliability Council (hereinafter, "NERC") as part of the Electric Power Reliability Act of 1967[272] and NERC developed *voluntary* transmission reliability standards for the BPS.[273]

Prompted by a widespread blackout in 2003, the EPAct of 2005 authorized the Commission to designate a national electric reliability organization (ERO), which would develop and enforce compliance with *mandatory* reliability standards in the United States.[274] "In 2006, FERC certified NERC as the ERO for the United States" and the North American Electric Reliability *Corporation* (NERC), a non-profit, was established as the successor to the North American Reliability *Council*.[275]

Today, FERC and governmental authorities in Canada oversee the North American Electric Reliability Corporation (hereinafter, "NERC").[276] NERC, as a certified ERO, is a non-profit international regulatory authority[277] charged with assuring the reliability and security of the BPS

[270] Chris Blazek, *supra* note 53, at 68-71.

[271] WECC, *supra* note 264.

[272] Chris Blazek, *supra* note 53, at 68-71.

[273] Thelen LLP, *United States: The Energy Policy Act of 2002- An Executive Summary*, MONDAQ (Jan. 16, 2006), https://www.mondaq.com/unitedstates/utilities/37182/the-energy-policy-act-of-2005--an-executive-summary#:~:text=The%20Act%20provides%20for%20the,for%20the%20bulk%2Dpower%20system.

[274] Chris Blazek, *supra* note 53, at 68-71.

[275] *Id*. 16 U.S.C. § 824o. The Federal Power Act § 215 "directs FERC to certify an 'Electric Reliability Organization' (ERO) tasked with developing mandatory and enforceable reliability standards for electric power. FERC subsequently issued Order No. 672 (71 Fed. Reg. 8662 (February 17, 2006)), which designated the North American Electric Reliability Corporation as the ERO, and adopted reliability standards to be enforced by that organization, subject to FERC oversight." Vann, *supra* note 75.

[276] NERC, About NERC, https://www.nerc.com/AboutNERC/Pages/default.aspx (last visited Sept. 7, 2021).

[277] Chris Blazek, *supra* note 53, at 69. The North American Reliability Council was formed after its predecessor organization, the North American Power Systems Interconnection Committee (NAPSIC), which was responsible for coordinating the largest bulk power system at the time, experienced weaknesses that contributed to widespread blackouts across eight states. Congress established the North American Reliability Council as part of the Electric Power Reliability Act of 1967. Its regulations were largely voluntary, however. After the northeast blackout in 2003 and the Energy Policy Act of 2005, the Commission was authorized to designate a national electric reliability organization (ERO), which would develop and enforce compliance with mandatory reliability standards in the United States. "In 2006, FERC certified NERC as the ERO for the United States" and the North American Electric Reliability *Corporation* (NERC), a non-profit, was established as the successor to the North American Reliability *Council*.

and subject to oversight from FERC.[278] It revised its policies into standards and now has authority to enforce them using financial penalties.[279] NERC has jurisdiction over electricity users, owners, and operators within the BPS, serving about 400 million customers.[280] It develops and enforces reliability standards; monitors the BPS; assesses reliability; and educates, trains, and certifies industry personnel.[281]

NERC operates through delegation. Six regional authorities have been delegated authority from NERC and are responsible for assuring reliability within their respective geographic areas. The authorities include: The Western Electricity Coordinating Council (hereinafter, "WECC"); the Midwest Reliability Organization (hereinafter, "MRO"); the Texas Reliability Entity, Inc. (hereinafter, "TRE"); the Northeast Power Coordinating Council, Inc. (hereinafter, "NPCC"); the Reliability First Corporation (hereinafter, "RFC"), and the SERC Reliability Corporation (hereinafter, "SERC").[282] Eighteen Reliability Coordinators (hereinafter, "RCs") serve these six

NERC, as a certified ERO, revised its policies into standards and had authority to enforce them using financial penalties. (*Id*.).

[278] NERC, *supra* note 276; Midwest Reliability Organization (MRO), About MRO, https://www.mro.net/about/Pages/default.aspx (last visited Sept. 7, 2021).

[279] Chris Blazek, *supra* note 53, at 68-71.

[280] NERC, *supra* note 276.

[281] *Id*.

[282] WECC, *supra* note 264; NERC, *supra* note 276; U.S. EIA, *supra* note 266. The Western Electricity Coordinating Council (WECC) is responsible for enforcing reliability standards within the Western Interconnection, comprised of: British Columbia, Alberta, the northern part of Baja California in Mexico, and Washington, Oregon, California, Idaho, Montana, Wyoming, Colorado, Nevada, Arizona, Utah, and small portions of North and South Dakota. (NERC, *supra* note 276). The Midwest Reliability Organization (MRO) is responsible for ensuring reliability within the Saskatchewan and Manitoba provinces, and all or parts of: Arkansas, Illinois, Iowa, Kansas, Louisiana, Michigan, Minnesota, Missouri, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, and Wisconsin. (MRO, *supra* note 278). The Texas Reliability Entity, Inc (TRE) is charged with ensuring reliability within the region governed by the Electric Reliability Council of Texas (ERCOT). (TEXAS Reliability Entity (TexasRE), About Us, https://www.texasre.org/pages/aboutus (last visited Sept. 7, 2021)). "Texas RE is independent of all users, owners, and operators of the BPS." (*Id*.) The Northeast Power Coordinating Council, Inc. (NPCC) is responsible for ensuring reliability within the geographic region that includes the Ontario, Québec, New Brunswick and Nova Scotia, as well as New York and the six New England states. (Northeast Power Coordinating Council, Inc. (NPCC), About NPCC, https://www.npcc.org/about (last visited Sept. 7, 2021). The Reliability First Corporation (RFC) is responsible for assuring reliability within the Great Lakes and Mid-Atlantic regions including all or portions of: Delaware, New Jersey, Pennsylvania, Maryland, Virginia, Illinois, Wisconsin, Indiana, Ohio, Michigan, Kentucky, West Virginia, Tennessee, and the District of Columbia. (Reliability First, About Us, https://rfirst.org/about/Pages/AboutUs.aspx (last visited Sept. 7, 2021). Finally, the SERC Reliability Corporation (SERC) is responsible for maintaining secure and reliable electric grid across the south-eastern and central regions of the United States including all or portions of: Florida, Georgia, Alabama, Mississippi, Louisiana, Texas, Oklahoma, Arkansas, Missouri, Iowa, Illinois, Kentucky, Tennessee, Virginia, North Carolina, and South Carolina. (SERC Reliability Corporation, About SERC, https://www.serc1.org/about-serc (last visited Sept. 7, 2021).

regions by monitoring the grid in real-time.[283] RCs interact with operators and other RCs to maintain operations and ensure reliable supply.[284]

Balancing Authorities (hereinafter, "BAs") are entities that operate the electric systems by maintaining load-generation balance in real-time and "identifying potential problems before a situation becomes critical[,]" which maintains the safe and reliable operation of the power system.[285] The balancing act is essential because local, and sometimes widespread, blackouts can result when demand and supply are out of equilibrium.[286] Managing supply and demand includes monitoring the transfer of electricity with other BAs and maintaining operating conditions that satisfy reliability standards set by NERC.[287] In the Eastern Interconnection there are thirty-six BAs, in the Western Interconnection there are thirty-seven BAs, and in ERCOT there is one.[288] In ERCOT, the same entity and physical system serves as the BA, the Interconnection, and the RTO, which is unique.[289]

b. The Two Primary Regulatory Models

The U.S. electric system has shifted from one that institutionalized the natural monopoly characteristics of a fully integrated utility to one that facilitates competition through open access transmission and generation dispatch markets.[290] Today, regulated, unregulated, and partially regulated electricity system models exist across the country.[291] While restructuring first occurred

[283] WECC, *supra* note 264. Reliability Coordinators include: British Columbia Hydro and Power Authority (BCRC); Alberta Electric System Operator (AESO); Saskatchewan Power Corporation (SPC); Midcontinent Independent System Operator (MISO); Ontario Independent Electricity System Operator (ONT); Hydro Quebec TransEnergie (HQT); New Brunswick Power Corporation (NBSO); ISO New England, Inc. (ISNE); New York Independent System Operator (NYIS); PJM Interconnection (PJM); Tennessee Valley Authority (TVA); VACAR-South (VACS); Southern Company Services, Inc. (SOCO); Florida Reliability Coordinating Council (FRCC); Electric Reliability Council of Texas (ERCOT); Southwest Power Pool (SPP); SPP West (SPPW); and the California Independent System Operator (RCW). NERC, Reliability Coordinators, https://www.nerc.com/pa/rrm/TLR/Pages/Reliability-Coordinators.aspx (last visited Sept. 7, 2021).

[284] WECC, *supra* note 264.

[285] WECC, *supra* note 264; U.S. EIA, *supra* note 266.

[286] U.S. EIA, *supra* note 266.

[287] *Id*.

[288] *Id*.

[289] *Id*.

[290] Chris Blazek, *supra* note 53, at 47-64.

[291] *Id*.

in the generation markets, gradually other activities, like system operations and retail sales, also moved away from a monopoly, or regulated, utility framework.[292] This shift expanded the key actors within the system and now there are two primary regulatory systems in the U.S. as a result.[293]

i. The Vertically Integrated Model

Key Actors

The vertically integrated model is represented by the natural monopoly power of utilities that control the generation, transmission, and distribution functions to serve electricity consumers needs within the utility's service area.[294] There are a number of key actors in the vertically integrated, non-restructured model, including investor-owned, federal, cooperative, municipal, nonutility power producers, and independent power producers.[295] Customers are primarily served by investor-owned utilities (sometimes called, "IOUs"), cooperative utilities (sometimes called, "co-ops"), and municipal utilities (sometimes called "munis"), with investor-owned utility companies serving the most customers.[296]

IOUs are for-profit companies that are owned by their investors, or shareholders, and tend to have large service areas across more than one state.[297] IOUs are for profit organizations that may exist as individual corporations or holding companies that operate as part of a parent company with ownership of more than one utility.[298] IOUs try to maximize their profits by taking advantage of economies of scale; they market power at retail rates and at wholesale rates to other utilities Because they are monopolies that operate for profit, IOUs are regulated by the state PSCs, which ensure customer interests are considered.[299] Most IOUs that operate in regulated retail states

[292] *Id*.

[293] *Id*.

[294] *Id*.

[295] *Id*.

[296] Inara Scott, *Teaching an old dog new tricks: Adapting Public Utility Commissions to Meet Twenty-First Century Climate Challenges*, 38 HARV. ENVTL. L. REV. 371 (2014) (internal citations omitted).

[297] U.S. Department of Energy (U.S. DOE), Office of Electricity Delivery and Energy Reliability, *United States Electricity Industry Primer,* (July 2015) https://www.energy.gov/sites/prod/files/2015/12/f28/united-states-electricity-industry-primer.pdf.

[298] Chris Blazek, *supra* note 53, at 47-64.

[299] U.S. DOE*, supra* note 297.

operate on a vertically integrated basis, providing generation, transmission, and deliver service at a bundled price to retail customers.[300]

Co-ops came about as a result of the Rural Electrification Administration, created in 1936.[301] Co-ops are customer-owned electric utilities that provide electricity to end users within their rural service territories.[302] They are organized under state law and are subject to cost-based operations (they are not incentivized to make a profit), members are entitled to receive a return of capital contributed, and governance is based on member voting.[303] Some co-ops are owned by other co-ops and some qualify as tax-exempt non-profits under the tax code.[304] While some co-ops offer distribution only, some provide distribution and supply of electricity (they purchase electricity from other utilities), and some provide generation and transmission services.[305] The Rural Utilities Service loan program (created by the Federal Crop Insurance Reform and Department of Agriculture Reorganization Act of 1994) provides financing for construction and improvement of electric generation, transmission, and distribution facilities in rural areas.[306] Due to the member ownership and control, co-ops are not usually regulated by PSCs.[307]

Municipal utilities are non-profit government entities that serve at the local or state level.[308] They are owned and operated by local communities and have a concentrated service area.[309] Municipalities may own and operate generation and distribution, or they may own and operate only the distribution system and may purchase power at wholesale from other utilities.[310] Due to the local ownership, municipalities are not often regulated by state or federal agencies.[311]

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[300] Chris Blazek, *supra* note 53, at 47-64.

[301] *Id*.

[302] *Id*.

[303] *Id*.

[304] *Id*.

[305] *Id*.

[306] *Id*.

[307] *Id*.

[308] *Id*.

[309] *Id*.

[310] *Id*.

[311] *Id*.

Federal power agencies "include the Bonneville Power Administration (BPA), the Tennessee Valley Authority (TVA), the Southeastern Power Administration (SWPA), the Southeastern Power Administration (SEPA), and the Western Area Power Administration (WAPA), among others.[312] Federal power agencies generate power from federally-owned generating facilities (typically hydropower) and transmit and sell their power to statutorily defined customers.[313] They are wholesale-only entities and they do not sell electricity to end-use customers, but they often own transmission lines connecting their generating facilities to other utility-owned service areas.[314] Federal power agencies are required to operate as non-profit entities, recovering their cost of operations and replaying the U.S. treasuring for borrowed funds.[315] After meeting their statutory obligations, federal power agencies can sell surplus electricity to other utilities.[316]

Non-utility power producers are also called QFs, which were established under PURPA and include combined power plants that cogenerate heat and electricity and small producers.[317] These non-utilities are generators that sell electricity in the wholesale market at the "avoided cost" rate.[318]

In vertically integrated markets, Independent Power Producers (hereinafter, "IPPs"), or "non-utility" generators[319] are privately owned companies that own and operate their own generation assets and sell electricity under long-term contracts.[320] IPPs are non-utility, for-profit companies that have no assigned service territories.[321] They are not permitted to own transmission facilities and, thus, must contract for transmission services to deliver electricity, sold at market-

[312] *Id*.

[313] *Id*.

[314] *Id*.

[315] *Id*.

[316] *Id*.

[317] *Id*.

[318] *Id*.

[319] U.S. DOE*, supra* note 297.

[320] Chris Blazek, *supra* note 53, at 47-64.

[321] *Id*.

based rates, to their customers.[322] IPPs are not QFs under PURPA, but they may be EWGs, which are exempt from some FERC reporting and ownership restrictions.[323]

The Coordinating Mechanism

Power Pooling agreements began as far back as the late 1920s (PJM).[324] They were historically and voluntarily created by groups of utilities to merge scheduling and dispatch functions.[325] Pooling facilitates more efficient resource planning, resource sharing, transmission balancing, and generation deployment,[326] creating greater system reliability, and lower costs within a region.[327] Pooling requires utilities to execute multilateral contracts through which members cede operational control over their generation assets and transmission facilities to a common operator.[328] Members also provide incremental cost data about their assets to the power pool operator so the energy management system can optimize the cost data to economically dispatch the resources within the power pool.[329]

After FERC passed Order 2000, power pools could opt to become RTOs and be regulated by FERC.[330] Where utilities do not form RTOs there is no RTO and there may be a power pool or there may not.[331] Where utilities do not pool there is no power pool and utilities and balancing authorities carry out resource planning, transmission balancing, and generation deployment themselves.[332]

Regulatory Bodies & Authority

[322] *Id*.

[323] *Id*.

[324] Federal Electricity Regulatory Commission (FERC), Energy Primer A Handbook of Energy Market Basics, at 42-43 (Nov. 2015), https://www.ferc.gov/sites/default/files/2020-05/energy-primer.pdf.

[325] Chris Blazek, *supra* note 53, at 47-64; FERC, *supra* note 324, at 42-75.

[326] *Id*.

[327] *Id*.

[328] *Id*.

[329] *Id*.

[330] *Id*.

[331] *Id*.

[332] *Id*.

In regulated, vertically integrated states, wholesale electricity trading occurs via bilateral transactions, or contracts, administered by the utility company.[333] Utility Companies are vertically integrated, they own their generation, transmission, and distribution assets; they perform maintenance on their equipment, and directly serve their end-users.[334] The utility generates or obtains electricity to serve its customers, ensures reliability of the transmission grid, balances, supply and demand instantaneously, dispatches its resources as economically as possible, coordinates dispatching efforts with neighbouring balancing authorities, plans transmission siting within their geographic region, and coordinate system development and expansion with neighbouring utility systems.[335]

Balancing authorities are numerous and imperative to an efficient and reliable transmission system where there is no RTO.[336] BAs are responsible for "dispatching generation, procuring power, operating the transmission grid reliably and maintaining adequate reserves. Although the BAs operate autonomously, some have joint transmission-planning and reserve-sharing agreements."[337]

At the federal level, FERC reviews and authorizes cost-based rates and some physical characteristics that drive supply and demand in regulated states.[338] The physical characteristics impacting supply include: fuel prices, capital costs, transmission capacity and constrains, and the operating characteristics of generation plants.[339] The physical characteristics impacting demand include: sharp changes in demand, and high demand. [340]

At the state level, PSCs conduct-cost of-service and rate proceedings to balance the interests of the utility and customers, and at the same time to ensure utilities have a reasonable opportunity to recover costs incurred in provision of the utility service and to generate a reasonable

[333] Chris Blazek, *supra* note 53, at 43-64.

[334] *Id*.

[335] *Id*.

[336] *Id*. at 44-45.

[337] FERC, *supra* note 324, at 74-75.

[338] Chris Blazek, *supra* note 53, at 47-64; FERC, *supra* note 324, at 42- 75.

[339] *Id*.

[340] *Id*.

rate of return on investments.[341] In traditional, non-restructured states the PSC sets retail electricity rates using ratemaking proceedings that consider the total cost of service inclusive of all aspects of the electricity system—generation, transmission, and distribution, purchasing, capital, operations, maintenance, and programs for consumer protection and energy efficiency.[342] The utility submits a cost-of-service filing to the PSC for approval. The filing includes details on the utility's expenses incurred as a result of providing service to customers and expenses incurred as a result of capital investments in the utility's facilities. The PSC schedules the cost-of-service filing for a public administrative proceeding, which allows for the PSC staff and other intervenors to participate in the proceeding by submitting testimony that addresses the utility's filing.

Once the PSC approves the total cost-of-service, also known as the revenue requirement, rates are developed by allocating the approved revenue requirement among the utility's customer classes based upon cost causation principles. Rate structures and their levels are then approved by the PSC to be charged to its customers.

This traditional cost-of-service proceeding approach requires the utility to receive PSC approval for the recovery of its expenses and system investment from its customers before it can incorporate those into rates.[343] This creates the classical problem of regulatory lag—there is a lag between the utility incurring expenses and recovering them from customers. When actual expenses are higher than those contemplated in rates, the utility may earn less than authorized, while when actual expenses are lower, the utility may earn more.[344]

Utilities tend to submit cost-of-service filings only when they require a rate increase, not when customers may be due a rate decrease. This is why many PSCs require utilities to submit cost of service filings on a regular, standardized time basis, such as every two or five years, or whatever period the PSC deems appropriate. Because cost-of-service proceedings consume a significant amount of time and resources, PSCs must balance the public interest in having rates reflective of the most up-to-date and accurate data and the cost and time it takes to arrive at final approved rates. Rate proceedings can take more than a year to conclude.

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[341] U.S. EPA, *supra* note 10.

[342] FERC, *supra* note 324, at 35-102.

[343] Scott, *supra* note 296.

[344] *Id*. (citing David B. Spence, *The Political Barriers to a National RPS*, 42 CONN. L. REV. 1451, 1457 (2010)).

ii. The Restructured Model

Key Actors

In restructured markets, key actors include merchant generators, transmission companies, transmission owners, distribution companies, electric power marketers, and energy service companies.[345] Merchant generators are independent for-profit organizations that own and operate generation assets.[346] They are usually formed by acquiring existing generation assets from previously vertically integrated utilities undergoing divestment from generation assets, or are formed as unregulated subsidiaries of utility holding companies.[347] In deregulated markets, merchant generators have a similar role to that of an IPP in regulated markets.[348] Though, unlike IPPs, which sell their electricity through long-term contracts, merchant generators sell to a variety of market participants and are, thus, more at more risk to market prices.[349] Merchant generators sell electricity to utilities, marketers, RTOs, or to end use customers; they are active in retail and wholesale markets.[350]

Transmission companies are investor-owned, for-profit companies that own and operate their transmission facilities.[351] Due to the interstate nature of their facilities, they are regulated by FERC.[352] Like merchant generators, transmission companies acquired their transmission lines from formerly vertically integrated utilities or were required to build out new transmission.[353]

Electric power marketers purchase electricity from generators and sell it in retail and wholesale markets.[354] Electric power marketers are valued in restructured markets due to the

[345] Chris Blazek, *supra* note 53, at 58, 47-64.

[346] *Id*. at 47-64.

[347] *Id*.

[348] *Id*.

[349] *Id*.

[350] *Id*.

[351] *Id*.

[352] *Id*.

[353] *Id*.

[354] *Id*.

services they provide and by bringing buyers and sellers together.[355] In this way, they perform many services previously provided by a vertically integrated utility.[356]

Utility distribution companies are the monopoly providers of electricity distribution services in restructured markets.[357] Depending on the state, the distribution utility may only be permitted to sell electricity or they may be permitted to sell and distribute electricity.[358] Because distribution is an intrastate activity, it falls under the jurisdiction of state PSCs.[359]

Energy service companies are for-profit entities that arose in regulated markets to provide supplemental services to those provided by the traditional vertically integrated utility, such as appliance maintenance, appliance sales, and demand-side management.[360] In the deregulated market, energy service companies continue to provide the above services and have taken on new roles associated with the restructured market, such as evaluating energy needs and identifying how to meet those needs.[361]

The Coordinating Mechanism

After passage of FERC Orders 888 and 2000 (both of which encouraged utilities to join RTOs where a non-interested entity would be responsible for operating regional transmission markets and ensuring open access and management practices), a number of RTOs formed in regions across the US. Today, nearly two-thirds of the electricity used by United States and Canada is coordinated and controlled by RTOs.[362] RTOs in the U.S. include:

- The California ISO ("CAISO," comprised of utilities operating mostly in CA and partially in AZ);

[355] *Id*.

[356] *Id*.

[357] *Id*.

[358] *Id*.

[359] *Id*.

[360] *Id*.

[361] *Id*.

[362] EUCI, *supra* note 189.

- The Southwest Power Pool ("SPP," comprised of utilities operating in part or all of MT, ND, SD, WY, KS, NE, OK, NM, TX, IA, MO, AR, LA);
- The Midcontinent ISO ("MISO," comprised of utilities operating in part or all of MT, ND, SD, WI, MI, IA, IL, ID, MO, AR, MS, LA);
- The Electric Reliability Council of Texas ("ERCOT," comprised of the utilities operating in TX);
- PJM (comprised of utilities operating in IL, ID, OH, MI, PA, NJ, KY, WV, VA, NC, DE, MD);
- The New York ISO ("NYISO," comprised of utilities operating in NY); and
- The New England ISO ("ISO-NE," comprised of utilities operating in ME, VT, NH, CT, MA, RI).[363]

RTOs have three primary roles: (1) operating the grid within their geographic area, (2) administering the wholesale electricity market, and (3) carrying out future power-system planning.[364] RTO operational duties entail monitoring the grid in real-time,[365] forecasting future

[363] FERC, *supra* note 324, at 40.

[364] WECC, *supra* note 264; ISO New England (ISONE), About Us, What we do, Our Three Critical Roles, https://www.iso-ne.com/about/what-we-do/three-roles/ (navigate to left tab to view pages on "Operating the Power System", "Administering the Wholesale Electricity Markets", and "Power System Planning") (last visited Sept. 7, 2021).

[365] Monitoring the grid is done by system operators, who undergo rigorous and continuous training and certification by NERC, to monitor, dispatch, and direct the flow of electricity across the grid from a master control center. A backup control center serves to provide system operators with redundancy and reliability in the event of the master control center becomes inoperable. ISONE, *supra* note 364.

demand,[366] ensuring an operational reserve of electricity,[367] coordinating outages,[368] and dispatching electricity based on market activity.[369] In this way, RTOs can be thought of as the music conductors of the grid.[370] The benefit of an RTO over a power pool is the access to competitive market systems provided and administered by the RTO.[371]

The RTO administers the wholesale grid, which means it conducts operations of the transmission system within its geographic footprint independent of individual utilities in an effort to transparently manage transmission congestion, coordinate maintenance of generation and transmission, balance supply and demand instantaneously, operate non-discriminant and competitive electricity markets, provide non-discriminatory interconnection for all generators, and oversee transmission planning and upgrades.[372] The RTO functions to ensure reliability of the

[366] To forecast future demand, system operators evaluate many variables that could impact the production or flow of electricity across the grid, including: hourly demand, which are variable depending on time of day, year, and weather; availability of resources; and the possible effects of failure at the generation, transmission, or circuit breaker level within the grid. These factors are assessed to create "load forecasts," which inform both short-term and long-term regional plans. System operators also "issue . . . instructions to each of the hundreds of resources—generators, transmission facilities, and other market participants in the region—to start up, shut down, raise or lower generation, modify interchange schedules, etc." *Id*.

[367] RTOs maintain and check the voltage and frequency of the transmission lines every few seconds to ensure that line voltage is within an acceptable range, and system frequency remains close to 60 hertz. RTOs also maintain an operating reserve of electricity supply in the instance of a system-level failure that causes a disturbance, sometimes referred to as a "contingency", to power. Resources that are designated as reserve power are identified prior to the operating day and typically include plants that are on standby, ready to produce electricity at a moment's notice. *Id*.

[368] Outages are coordinated at both the transmission and generation level and are done in a manner that prioritizes system-level reliability. This is done by measuring the impact of a proposed outage on the grid and can be incredibly useful. For instance, "congestion" occurs when a transmission outage prevents the least-cost electricity from being transmitted to meet demand in a particular area, and the additional cost is referred to as "congestion cost." The congestion cost is incorporated into the price of wholesale electricity. Thus, coordinating outages based on historic peak demand can minimize the congestion costs associated with planned outages due to line maintenance and repair. *Id*.

[369] Dispatching is done in tandem with the electricity market; the RTO will concurrently dispatch the plants scheduled through the markets, beginning with the plant that submitted the lowest offer, and schedule the delivery of electricity through transmission lines. As consumption increases over the course of the day, the RTO dispatches the plant with the next lowest offer and so on until demand is met. Regional control centers operated by transmission companies may assist the RTOs by monitoring variables locally and taking local action at the direction of the RTO, such as switching transmission lines in or out of service. *Id*.

[370] *Id*.

[371] FERC, *supra* note 324, at 42-43.

[372] *Id*. at 58-59.

transmission system. RTOs do not own transmission or generation, perform maintenance on generation or transmission equipment, or directly serve end-use customers.[373]

An RTO oversees competitive generation markets and the operation of the transmission system; they have broad control over participating utilities' transmission lines and ensure non-discriminatory access to market participants.[374] They also coordinate transmission system updates and changes to ensure the stability, reliability, and operating characteristics remain stable by conducting audits to ensure resources operate as expected.[375]

RTOs are financially independent from the companies doing business in the market to ensure their administration of the wholesale electricity market is not manipulative.[376] The wholesale electricity market is generally comprised of three main markets, energy markets,[377] which are the day-to-day transactions of wholesale electric power; capacity markets,[378] which are the transactions that represent long-term system reliability; ancillary services,[379] which ensure short-term system reliability.[380]

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[373] *Id*.

[374] U.S. EPA, *supra* note 10.

[375] ISONE, *supra* note 364.

[376] *Id*.

[377] *Energy markets* include the day-ahead market, the real-time market, and bilateral trading. In the day-ahead market, participants secure prices for electric energy the day before electricity and hedge against price fluctuations that may occur in the real-time market. In the real-time market, participants secure electric energy in real-time to balance demand and the dispatch of generation. Participants may also draw up individual contracts, often called bilateral trading, or transact Financial Transmission Rights (FTRs), which are financial instruments with economic value that deliver credit to the FTR holder if energy flows in the same direction as the congested flow or a charge if energy flows in the opposite direction as the congested flow. PJM, Buying and Selling Energy, Financial Transmission Rights FAQs, https://learn.pjm.com/three-priorities/buying-and-selling-energy/ftr-faqs/what-are-ftrs.aspx#faq-box-text0 (last visited Sept. 7, 2021); *Id*.

[378] *Capacity markets* include both short-term and long-term markets. The Forward Capacity Market (FCM) is a long-term capacity market that ensures there are sufficient resources to meet projected demand for electricity three years into the future. Generators are paid in this market to remain "on-call" and to operate when needed once their capacity commitment period starts. ISONE, *supra* note 364.

[379] *Ancillary Services* are acquired in short-term capacity markets as discussed below. The Regulation Market is how the ISO/RTO balances and maintains system frequency near 60 hertz by instructing a participant to increase or decrease output moment-by-moment. The Forward Reserve Market ensures resilience by keeping capacity in reserve and available to provide electric energy within 10 or 30 minutes. The Real-Time Reserve Pricing Market requires participants in a ready-to-respond state to changes in supply or demand to maintain system reliability. The Voltage Support Market allows system operators to maintain transmission voltages within an acceptable range to ensure electricity flows continuously and reliably. Finally, the Blackstart Capability Market "compensates specific power plants at key locations for their capability to restart the transmission system following a blackout." *Id*.

[380] *Id*.

Power system planning is the final duty of RTOs and includes conducting analyses to ensure power resource needs are met within the geographic region over the next ten years.[381] The RTO conducts comprehensive system-level analyses and shares the outcomes with the marketplace to "signal where new investments are needed."[382] The RTO considers electricity consumption patterns and projected growth, the adequacy of resources to meet projected demand, fuel supplies, fuel diversity, environmental retirements, potential plant retirements, expected development and resource expansion scenarios, integration of renewable resources, and the impact of public policy.[383] Often, ISOs/RTOs rely on private investments in new power projects, but if resources are not adequate to meet the geographic area's expected future demand, the RTO may conduct a competitive process to ensure development.[384]

All RTOs function as BAs.[385] Supply and demand are balanced by matching bids for supply with bids for demand (reverse auctioning).[386] In the instance of electricity shortage, whether generation or transmission, the RTO can request a temporary interconnection under the FPA.[387]

Regulatory Bodies & Authority

In states where the traditional vertically integrated structure has been restructured (*i.e.*, where generation assets have been divested and where transmission assets have been moved under the auspices of a subsidiary company and are subject to FERC-approved transmission rates), FERC authorizes the RTO to sell wholesale electricity at market-based rates, with prices reflecting the physical characteristics that drive supply and demand (noted above).[388] Each RTO has its own pricing and parameters for operation, but usually these include a day-ahead market, a real-time

[381] *Id*.

[382] *Id*.

[383] *Id*.

[384] *Id*.

[385] WECC, *supra* note 264; U.S. EIA, *supra* note 266.

[386] Mark F. Sundback et al., *Electricity regulation in the United States: overview* (THOMPSON REUTERS PRACTICAL LAW JUL. 2020) https://uk.practicallaw.thomsonreuters.com/8-525-5799?transitionType=Default&contextData=(sc.Default)&firstPage=true.

[387] *Id*.

[388] Chris Blazek, *supra* note 53, at 58-59.

market, a capacity market, ancillary services market, and contracts for hedging the cost of limited transmission capability.[389]

At the state level, the PSC rate proceedings are similar, but the cost-of-service filing submitted by the utility does not include costs associated with the divested functions. "The PSC . . . no longer regulate[s] the rates for generated or purchased power. Retail electricity prices [are] open to the market forces of competition."[390] Instead, the generation and/or transmission costs are incurred by the utility and passed through to the customer as separate line items on the customer's bill. Though, the PSC continues to regulate rates for distribution, siting distribution and generators.[391] As restructuring continues, the PSCs' responsibilities will change.[392] Though, "the goal of each state [PSC] remains to provide its state's consumers with reliable, reasonably and fairly priced electric power." Instead, the generation and/or transmission costs are incurred by the utility and passed through to the customer as separate line items on the customer's bill.[393]

IV. Conclusion

This paper presents the chronologic regulatory evolution of the electricity sector in the U.S. with hopes that it may provide context to the forthcoming transition in electricity generation. Future work will explore and recommend ways to value, prioritize, and define resiliency in electricity systems given the challenges presented by increased demand and consumption and an increase in events that threaten electric system reliability.

[389] *Id*. at 35-76.

[390] Chris Blazek, *supra* note 53, at 47-64.

[391] *Id*.

[392] *Id*.

[393] *Id*.