Mobilizing Microgrids for Energy Justice

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ABSTRACT

Accelerating climate change has unleashed historic storms, floods, and fires. To reduce emissions, the world is moving away from fossil fuels toward electrification through cleaner sources. Yet the U.S. electric utility system, much of it built a century ago, is not only failing to stand up under these conditions, but in some instances actually sparking the wildfires. Moreover, just as we are increasing our reliance on electricity for critical needs—including transportation, heating, communication, data, and medical devices—the United States has suffered a growing number of blackouts, brownouts, and preventative public safety power shutoffs.

Twenty-first century technologies, such as rooftop photovoltaic solar, improved batteries, and microgrid controllers, have made clean energy microgrids increasingly appealing as a defense. The military and corporations have turned to electricity self-sufficiency in the form of stand-alone microgrids to limit their vulnerability and provide reliability and resilience in response to utility failures.

Yet grid-connected microgrids are still struggling to gain a toehold in territories now served by large for-profit utility companies. This for-profit model is the dominant form of electricity service in the United States, and resistance from these companies, as well as from some of the entrenched businesses and regulators whose jobs depend on perpetuation of this century-old model, has stalled deployment of new technologies. These obstacles have recently hindered the construction of microgrids, preventing development of a type of system that could provide critical back-up services to disadvantaged communities who lack

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resources to advocate for themselves or to purchase energy alternatives. Providing critical back-up power as a defense for those who can least protect themselves through these community microgrids could both literally and figuratively provide shelter from the storms.

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INTRODUCTION

Humans are creatures of habit. They embrace the status quo and rarely accept change without fear or resistance. In the early 1800s, inhabitants of the United States burned wood for cooking and heating. Convincing them to switch to coal was tricky.[1] Authors at the time—such as Harriet Beecher Stowe and Nathaniel Hawthorne—denounced coal as, in modern terms, un-American.[2] The obstacles were both technological and cultural. Technologically, the metal stoves needed to burn coal were expensive, and the coal itself was difficult to light. Culturally, the new enclosed metal stoves—unlike the open flames of a traditional fireplace—were not conducive to social congregation, and they required changes to food preparation methods.[3] Finally, the smell of coal was offensive, and coal itself was blamed for an array of ailments.[4]

Once again, the United States is resisting new forms of energy. This time, the pushback is aimed against distributed—or "grid-edge"—technologies such as rooftop solar, storage, and the microgrids that combine these renewable energy sources to provide localized, self-sufficient power.[5] The resistance is not coming from consumers, however. Instead, it is coming from for-profit investor-owned monopoly utilities (IOUs). These IOUs benefit and derive their monopoly power from existing regulatory structures. The primary model for supplying electricity in the United States, for example, is through state franchises, granted exclusively to IOUs.[6] Furthermore, the most widely adopted electric rate structure—cost of service—incentivizes IOUs to continue investing in large, centralized electricity generation plants and to stifle innovation.[7] This utility

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[1] Clive Thompson, *When Coal First Arrived, Americans Said "No Thanks*," SMITHSONIAN MAG. (July/Aug. 2022), https://perma.cc/CT2Z-7CTA.

[2] *Id.*

[3] *Id.*

[4] *Id.*

[5] Another moniker for grid-edge technologies is "non-wires alternatives." Lisa Cohn, *What Are Non-Wires Alternatives?*, MICROGRID KNOWLEDGE (June 21, 2019), https://perma.cc/2BZS-ES4M. Utility companies' investments in these alternatives may reduce or eliminate the need for traditional utility infrastructure. *Id.*

[6] Anodyne Lindstrom & Sara Hoff, *Investor-Owned Utilities Served 72% of U.S. Electricity Customers in 2017*, U.S. ENERGY INFO. ADMIN. (Aug. 15, 2019), https://perma.cc/RS4J-Q54X.

[7] LEONARD S. HYMAN ET AL., AMERICA'S ELECTRIC UTILITIES: PAST, PRESENT & FUTURE 482 (8th ed. 2005) ("The [electric] industry seemed to have developed an allergic reaction to innovation: 'Why bother? If it succeeds, the regulator will appropriate the benefits for consumers. If it fails, the shareholders will lose out.' Or so it seemed. . . . The electric power industry allocates a paltry 0.3% of revenue to research and development.").

model has led IOUs to weaponize state statutory definitions of "public utility" to thwart the deployment of microgrids and other grid-edge technologies.

Imagine how little innovation would have occurred if every new feature of an iPhone or a Tesla had to first be approved through a lumbering process before an agency that relishes its control and that permits competitors to challenge new technologies for any potential negative impact, even to those competitors' bottom lines. Instead, these technologies have flourished in a free market that employed other customer protection mechanisms.

IOU resistance to localized, self-sufficient power sources comes at a dangerous time. In 2022, the United States suffered over $171 billion in losses from record-breaking climate disasters including fires and storms.[8] The executive secretary of the United Nations Climate Change Secretariat recently declared that world powers are "nowhere near" the emission cuts necessary to avert or mitigate climate disaster.[9] Erratic weather and fires have resulted in record numbers of blackouts, brownouts, and preventative power shutoffs.[10]

Large utility infrastructure is not only a victim of weather but also of war. In November 2022, Russia began to strategically target Ukraine's energy infrastructure, plunging the populace into a winter of cold and darkness.[11] Ukraine, however, is not alone as a target. Hostile forces are using cyberattacks on energy infrastructure worldwide;[12] white supremacist attacks on electrical substations throughout the United States, for example, have "dramatically

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[8] *U.S. Billion-Dollar Weather and Climate Disasters*, NAT'L CTRS. FOR ENV'T INFO. (2023), https://perma.cc/8TGG-6DTV.

[9] Steven Mufson & Sarah Kaplan, *Climate-Warming Methane Emissions Rising Faster than Ever, Study Says*, WASH. POST (Oct. 26, 2022, 2:31 PM), https://perma.cc/5VBZ-NA7A.

[10] *See, e.g.*, Anodyne Lindstrom & Sara Hoff, *U.S. Electricity Customers Experienced Eight Hours of Power Interruptions in 2020*, U.S. ENERGY INFO. ADMIN. (Nov. 10, 2021), https://perma.cc/59G3-TSTF; Rachel Ramirez, *Power Outages Are on the Rise, Led by Texas, Michigan and California. Here's What's to Blame*, CNN (Sept. 14, 2022, 6:00 AM EDT), https://perma.cc/RQ6B-9EPH; *see also* POWEROUTAGE.US, https://perma.cc/4BHC-QAHY (showing real-time U.S. power outage data).

[11] Marc Santora, *For Ukraine, Keeping the Lights On Is One of the Biggest Battles*, N.Y. TIMES (Nov. 17, 2022), https://perma.cc/584Y-HYNW ("In a relentless and intensifying barrage of missiles fired from ships at sea, batteries on land and planes in the sky, Moscow is destroying Ukraine's critical infrastructure, depriving millions of heat, light and clean water.").

[12] *See, e.g.*, Tawfiq M. Aljohani, *Cyberattacks on Energy Infrastructures: Modern War Weapons*, ARXIV (Aug. 28, 2022, 05:19:48 UTC), https://perma.cc/3HN6-CHQ5.

increased in frequency."[13] A successful attack of this kind on critical substations could "knock out power in half the country."[14]

In 1956, Congress passed legislation to fund the interstate highway system.[15] While the system had civilian benefits,[16] one of its goals was military: to reduce vulnerabilities from hostile strikes by dispersing critical infrastructure.[17] Corporations and the military have increasingly turned to microgrids for a similar reason; self-sufficient, decentralized, electrical infrastructure is less vulnerable to hostile interference.[18]

Corporations and the military are not alone in wanting to secure their sources of electricity. Energy, and more specifically electricity, has become "a fundamental need and the driving determinant of human progress."[19] Vulnerable communities need electricity for water, heat, and emergency services during times of disruption to the centralized grid. From Ukraine to New Jersey, microgrids have already provided life-saving electricity to communities in need.[20]

Yet communities in need often do not have the financial resources available to corporations or the military to create microgrids. Low-income individuals may have access to electricity, but they have fewer choices among utility

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[13] ILANA KRILL & BENNETT CLIFFORD, MAYHEM, MURDER, AND MISDIRECTION: VIOLENT EXTREMIST ATTACK PLOTS AGAINST CRITICAL INFRASTRUCTURE IN THE UNITED STATES, 2016-2022 (2022), https://perma.cc/2QZA-K7UR.

[14] Michael Levenson, *Attacks on Electrical Substations Raise Alarm*, N.Y. TIMES (Feb. 4, 2023), https://perma.cc/LYP5-5BJQ.

[15] Federal-Aid Highway Act of 1956, 23 U.S.C. §§ 101-301 (1956).

[16] *Interstate Highway System - The Myths*, FED. HIGHWAY ADMIN., https://perma.cc/ZFS9-T5X6 (Nov. 20, 2019).

[17] 23 U.S.C. § 108 (1956) ("Because of its primary importance to the national defense, the name of such system is hereby changed to the 'National System of Interstate and Defense Highways.'").

[18] *See* Ken Silverstein, *Microgrids Might Make Sense—Especially for Remote Businesses with Limited Grid Access*, ENV'T + ENERGY LEADER (Feb. 4, 2022), https://perma.cc/47MU-W6Y3; *"Fort Renewable" Shows Benefits of Batteries and Microgrids for Military and Beyond*, NAT'L RENEWABLE ENERGY LAB'Y (July 27, 2021), https://perma.cc/6GNF-TDNA.

[19] Lakshman Guruswamy, *Energy Justice and Sustainable Development*, 21 COLO. J. INT'L ENV'T L. & POL'Y 231, 233 (2010).

[20] *See* Eliza Batchelder et al., *Ukraine's Potential Energy*, CTR. FOR STRATEGIC & INT'L STUD., https://perma.cc/J56Y-GUHH; Morgan Kelly, *Two Years After Hurricane Sandy, Recognition of Princeton's Microgrid Still Surges*, PRINCETON UNIV. (Oct. 23, 2014, 2:00 PM), https://perma.cc/67WV-FEKU.

providers and face higher energy burdens.[21] In addition, as this Article shows, many utilities have traditionally resisted microgrids or other innovative technologies.

The federal government is providing some relief for communities who previously might not have been able to make energy choices. The Biden Administration's Justice40 Initiative is providing resources to address energy insecurity in the United States and includes a number of energy-specific targets including access to reliable and clean energy and responses to climate change impacts.[22] The Inflation Reduction Act and the Infrastructure Investment and Jobs Act also provide federal funding for these initiatives.[23] However, some of this funding will expire within the next two years, and money alone will not solve the problems if the underlying system is broken as it is with electric utilities in most states.

Although microgrids as a concept have increasingly gained support, their implementation still faces obstacles. For example, the California Public Utility

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[21] "Energy burden" refers to the portion of a household's income spent on home energy costs. U.S. DEPT. OF ENERGY, OFF. OF ENERGY EFFICIENCY & RENEWABLE ENERGY, LOW-INCOME HOUSEHOLD ENERGY BURDEN VARIES AMONG STATES—EFFICIENCY CAN HELP IN ALL OF THEM (2018), https://perma.cc/L6C2-URH9. Energy justice attempts to address this inequity, much as environmental justice addresses the disproportionate burden of environmental harms on disproportionally impacted, or "overburdened," communities. *EJ 2020 Glossary*, U.S. ENV'T PROT. AGENCY, https://perma.cc/5MQ4-5VYW (Aug. 18, 2022). "Energy poverty" is a multidimensional concept, ranging from a complete lack of access to electricity to a lack of affordability, reliability, or environmentally sound energy sources. *See, e.g.*, SLAVICA ROBIĆ ET AL., UNDERSTANDING ENERGY POVERTY—CASE STUDY: TAJIKISTAN (2010), https://perma.cc/D8Z7-8LL4; WORLD ECON. F., FOSTERING EFFECTIVE ENERGY TRANSITION: 2022 EDITION (2022), https://perma.cc/8B2E-PQ2X. Energy justice is distinct from environmental or climate justice, although the three are closely related. K.K. DUVIVIER, ENERGY LAW BASICS 34 (2017).

[22] Soon after taking office, President Biden signed Executive Order 14,008, which announced the "Justice40 Initiative," a pledge that 40% of the overall benefits of certain federal investments flow to populations that have been marginalized and overburdened by pollution. *Justice40: A Whole-of-Government Initiative*, THE WHITE HOUSE, https://perma.cc/BQ8N-CKZF. The process has begun by identifying "disadvantaged communities" that will be the focus of initial efforts. *Id.* On April 21, 2023, President Biden signed a follow-up Executive Order on Revitalizing Our Nation's Commitment to Environmental Justice for All. Exec. Order No. 14,096, 88 Fed. Reg. 25251 (Apr. 26, 2023). The order creates the White House Office of Environmental Justice to encourage the consideration of environmental justice in all White House work related to state, tribal, territorial, and local governments. *Id.* In 2022, the EPA formed its own Office of Environmental Justice and External Civil Rights, merging three existing EPA programs to help administer some of the environmental justice initiatives in the Inflation Reduction Act (IRA). *EPA Launches New National Office Dedicated to Advancing Environmental Justice and Civil Rights*, U.S. ENV'T PROT. AGENCY, https://perma.cc/8M5R-LASX (Sept. 24, 2022).

[23] Inflation Reduction Act of 2022, Pub. L. No. 117-169, 136 Stat. 1818 (2022); Infrastructure Investment and Jobs Act, Pub. L. No. 117-58, 135 Stat. 429 (2021).

Commission's (CPUC) handling of Sunnova's recent application to operate "public utility microgrids" reflects the sources of future debate and challenges to come.

This Article proceeds in five parts. Part I explains microgrid technology and its benefits both to participants and to the centralized grid. This Part also describes community microgrids and their special attributes. Finally, it illustrates the devastating impact of the current utility regulatory structure on innovative microgrid technologies, using as an example the recent CPUC's rejection, without a hearing, of Sunnova's application to serve as a microgrid utility.

Sections II.A through II.C provide background regarding how the current investor-owned utility structure came to dominate the United States. This background is important to better understand how current structure is stifling competition and impeding the deployment and development of new technologies. Section II.D chronicles how Federal Energy Regulatory Commission (FERC) intervention was required to encourage IOUs to competitively price grid-edge technologies such as solar generation, storage, and demand-side management—three of the technologies that microgrids now embrace. These efforts also illustrate federal government's limited ability to fix predominantly intrastate infrastructure systems controlled by state legislatures and public utility commissioners susceptible to industry lobbyists.

Part III is a comprehensive survey of state regulation of the public utility industry. Because the answers cannot come from the federal government, this Part sets out the various state statutes that define what entities qualify as "public utilities" that must be regulated by state commissions. Part IV exhibits how private utilities have weaponized these state statutory definitions to stymie the deployment of rooftop solar.

Part V chronicles the paltry efforts of the four states that have attempted to promote microgrids, arguing that even the most significant of these efforts, by California, are insufficient. Finally, this Part summarizes promising state and federal funding opportunities to promote community microgrids. These efforts, however, will have limited success if the underlying regulatory structure continues to thwart and delay their deployment.

I. MICROGRIDS

Microgrids are self-contained electricity systems that can operate independently from the macrogrid (more commonly called "the grid"). Modern

clean microgrids are made possible by novel technologies, including (1) electricity generation from photovoltaic solar panels and wind turbines, (2) energy storage,[24] and (3) coordination of demands, also called "demand-side management," using a microgrid controller, a sophisticated energy management software system.[25] The latter is the newest and fastest evolving of these technologies. A microgrid controller enables a microgrid "to switch off from the central grid . . . and . . . direct the new flows of energy from on-site resources to meet facility load."[26]

The utility structure and regulatory problems and solutions discussed throughout this Article apply to each of these new technologies: solar and wind generation, battery storage, and microgrid coordination and control of electricity generation and consumption. The focus here, however, is on microgrids, for two reasons. First, microgrids utilize all of the previously mentioned new technologies. Second, most of the other technologies, such as solar and storage, now have a history of challenges and legislative or federal regulatory fixes for those challenges, but microgrids are facing some of the greatest grid-connection hurdles just as they are also garnering more attention and financial resources because of the role they can play for climate disaster resiliency.

This Part will begin by discussing (A) the attributes of microgrids, then (B) the special promise of community microgrids for addressing energy justice issues. Finally, this Part will recount (C) how recent efforts to introduce an innovative microgrid model by Sunnova in California has been rebuffed.

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[24] The DOE has created the Energy Storage Grand Challenge (ESGC) as a comprehensive program to accelerate the development, commercialization, and utilization of next-generation energy storage technologies with the goal of developing and domestically manufacturing energy storage technologies that can meet all U.S. market demands by 2030. *Energy Storage Grand Challenge*, U.S. DEP'T OF ENERGY, https://perma.cc/G3C7-ZVJW.

[25] *E.g.*, Wärtsilä's GEMS Digital Energy Platform, "a smart software platform that monitors, controls and optimises energy assets on both site and portfolio levels." *Energy Storage & Optimisation*, WÄRTSILÄ, https://perma.cc/Y8QB-T4QL. Wärtsilä's platform was used by Duke Energy in its microgrid discussed. *See infra* note 67 and accompanying text; *see also* Franco Canziani et al., *Hybrid Photovoltaic-Wind Microgrid with Battery Storage for Rural Electrification: A Case Study in Peru,* FRONTIERS IN ENERGY RSCH. (Feb. 18, 2021), https://perma.cc/3WFA-J599.

[26] Maddie Lee, *How the Inflation Reduction Act of 2022 Will Drive Energy Resilience*, ENEL: INSIGHTS (Feb. 2, 2023), https://perma.cc/9YTW-7B65.

A. Microgrid Attributes

Before alternating current (AC) permitted a central-station model—with (1) coal plants or hydropower for generation, (2) transmission, and (3) distribution to customers—isolated power plants were the norm. These isolated power plants, owned by institutions and early utilities—including Edison's Pearl Street Station—were more similar to today's microgrids rather than the sprawling utility macrogrids that now span multiple states and millions of customers.[27] These plants often included the components of current statutory microgrid definitions: "integrated energy system[s] consisting of interconnected loads and distributed energy resources (including generators and energy storage devices)."[28] In the early years of electricity generation, these systems had no larger macrogrid to which they could connect. Over the years, however, utilities abandoned the isolated-power-plant model in favor of central-station generating systems with transmission to customers.[29] It took time. For "more than thirty years after the introduction of the central station grid," independent private plants were still "the most common source of electricity consumed in the United States."[30] Eventually, institutions with independent power joined the utility macrogrids.[31]

Some institutions with isolated power plants, however, maintained their independent generation capacity. These older independent systems, as well as newer systems created specifically to act independently of the grid, recently received the moniker "microgrid."[32] In the United States, modern microgrid deployment was initially slow, with only eighty-two permit applications prior to

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[27] Gene Wolf, *A Short History: The Microgrid*, T&D WORLD (Oct. 24, 2017), https://perma.cc/W8GH-N96Z.

[28] 42 U.S.C. § 17231(b)(6).

[29] *Electricity Explained: How Electricity Is Delivered to Consumers*, U.S. ENERGY INFO. ADMIN., https://perma.cc/U446-SQLN (Aug. 11, 2022).

[30] JOHN MANSHRECK, TRANSFORMATION OF THE ELECTRIC UTILITY BUSINESS MODEL: FROM EDISON TO MUSK 182 (2022).

[31] *See, e.g.*, Milan Kovacevic, *Hotel Del Coronado has Landmark History*, KPBS (Jan. 8, 2007, 8:30 PM PST), https://perma.cc/T9CX-FP2U (reporting that the Hotel del Coronado in San Diego had its own power plant built during 1887-1888, and the power plant provided power to both the hotel and all of Coronado up to the 1930s).

[32] Robert Lasseter and others are credited with proposing the modern microgrid concept in the late 1990s and early 2000s. *See, e.g.*, ROBERT LASSETER ET AL., INTEGRATION OF DISTRIBUTED ENERGY RESOURCES: THE CERTS MICROGRID CONCEPT (2002), https://perma.cc/M6L6-SNA8. *See also* Dan T. Ton & Merrill A. Smith, *The U.S. Department of Energy's Microgrid Initiative*, 25 ELEC. J. 84 (2012).

2010.[33] As of 2019, there were over 4,400 microgrids worldwide,[34] but only 687 of those in the United States as of 2022.[35] However, U.S. installations have almost doubled since 2016,[36] reaching almost ten gigawatts of capacity by the third quarter of 2022, with growth expected to exceed 20% in 2023.[37]

In 2012, the public gained new appreciation for the value of microgrids in a world experiencing rapid climate change when buildings and campuses with the capacity to generate their own power kept the lights on during the outages caused by Superstorm Sandy. [38] For example, Princeton University demonstrated the advantages of microgrids when Princeton's microgrid, fueled by the school's independent power plant, made its campus "'a place of refuge' [for] police, firefighters, paramedics and other emergency-services workers."[39] In addition, "[l]ocal residents whose homes lost power also were invited to warm up, recharge phones and other electronic devices and use wireless Internet service at a hospitality center that was opened on campus." [40] Princeton's microgrid system provided critical back-up power for these emergency services.

As the Princeton example illustrates, microgrids provide a number of benefits, but the most salient is resilience.[41] Backup power for participants is

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[33] *See Combined Heat and Power and Microgrid Installation Databases*, U.S. DEP'T OF ENERGY, https://perma.cc/U8NJ-5HX6 (Apr. 1, 2023) (within the "Summary microgrid data set" file, under the "App v. Year" tab).

[34] *Navigant Research Has Identified 4,475 Microgrid Projects Representing Nearly 27 GW of Planned and Installed Power Capacity Globally Through 2Q 2019*, BUS. WIRE (July 16, 2019, 05:15 AM EDT), https://perma.cc/H5GH-9GNX.

[35] *See Combined Heat and Power and Microgrid Installation Databases*, *supra* note 33.

[36] *See id.*

[37] Elisa Wood, *Five Takeaways from Wood Mackenzie's New Analysis Showing Rapid Microgrid Growth Despite the Economy*, MICROGRID KNOWLEDGE (Feb. 6, 2023), https://perma.cc/FWT4-XRA8.

[38] Over eight million electricity customers from North Carolina to the Canadian border and as far inland as Ohio and Indiana lost power as a result of Superstorm Sandy, which hit the Eastern Seaboard of the United States in October 2012. David Sheppard & Scott DiSavino, *Superstorm Sandy Cuts Power to 8.1 Million Homes*, REUTERS (Oct. 30, 2012, 7:03 AM), https://perma.cc/N22V-T6G4.

[39] Kelly, *supra* note 20.

[40] *Id.*

[41] In contrast to "reliability," which means the "ability to maintain consistent service in non-catastrophic conditions," the term "resilience" means "the ability of the electricity supplier to continue operating in the face of disaster or to quickly recover from events that cause widespread disruptions (e.g., hurricanes)." THOMAS HANCOCK ET AL., ANALYSIS OF THE MICROGRID MARKET FOR SMALL AND MEDIUM-SIZED MUNICIPALITIES AND ELECTRIC COOPERATIVES 15 (2021), https://perma.cc/26E7-N7GV.

the primary reason organizations develop microgrids.[42] Fires and extreme storms have accelerated the adoption of solar arrays and back-up personal storage.[43] Entities with financial resources, including retail stores, manufacturing facilities, and military operations, have led the way in microgrid deployment,[44] but schools and communities lag behind.[45] Overall, only a handful of the existing microgrids are connected to the macrogrid ("grid-connected") largely due to complications or resistance from IOUs and regulating agencies.[46]

Nonetheless, microgrids realize their most significant benefits when they are grid-connected. In fact, the current statutory definition for microgrid includes the ability to connect or disconnect (also known as "islanding") from the macrogrid.[47] When grid connection can be achieved, microgrids' ability to provide two-way connection—both giving and receiving power from the macrogrid—provides additional benefits to both the participants and the macrogrid.

While microgrids provide resilience to communities, one of their main benefits to the macrogrid is reliability. Grid-connected microgrids can benefit the macrogrid by providing ancillary services to meet reliability standards.[48] While IOUs were initially trusted to provide reliable service on their own, faith in the reliability of the macrogrid was shattered on November 2, 1965, when a small broken relay in the Ontario Hydro system triggered the Northeast

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[42] DANIEL SHEA, MICROGRIDS: STATE POLICIES TO BOLSTER ENERGY RESILIENCE (2022), https://perma.cc/PA5G-DY6U.

[43] *See, e.g.*, Justine Calma, *Elon Musk Offers Discounted Solar Panels and Batteries After California Blackouts*, VERGE (Oct. 28, 2019, 2:04 PM PDT), https://perma.cc/9BAH-PYF6.

[44] Wood, *supra* note 37; *see also Microgrids*, CTR. FOR CLIMATE & ENERGY SOLS., https://perma.cc/J2H3-KDFY (stating less than 0.2% of U.S. electricity comes from microgrids). The states with leading microgrid capacity are Texas, New York, California, Hawaii, Alaska, Georgia, Michigan, and Maryland. *Microgrid Penetration Capacity in the United States in 2020, by Select State*, STATISTA (Mar. 14, 2023), https://perma.cc/CVZ2-C8D4. This list is inconsistent with the Dep't of Energy, which lists fewer installations in Georgia, Michigan, and Maryland. *Combined Heat and Power and Microgrid Installation Databases*, *supra* note 33.

[45] *See id.*; *see also* Stephanie Lenhart & Kathleen Araújo, *Microgrid Decision-Making by Public Power Utilities in the United States: A Critical Assessment of Adoption and Technological Profiles*, RENEWABLE & SUSTAINABLE ENERGY REVS., Apr. 2021, at 2-4.

[46] OWEN ZINAMAN ET AL., WHITE PAPER: ENABLING REGULATORY AND BUSINESS MODELS FOR BROAD MICROGRID DEPLOYMENT 13-27 (2021), https://perma.cc/CU34-CLAY. *See generally* Alexandra Klass et al., *Grid Reliability Through Clean Energy*, 74 STAN. L. REV. 969 (2022); TOM STANTON, MICROGRIDS POLICY PROGRESS IN THE STATES (2020), https://perma.cc/48D8-QYBR.

[47] *See, e.g.*, 42 U.S.C. § 17231(b)(6).

[48] *Grid Systems*, OFF. OF ELEC., https://perma.cc/UV73-B8K7.

Blackout, at that time "the worst power failure in the age of electricity," with thirty million people over 80,000 square miles losing power.[49] The federal government intervened with reliability standards.[50] Now, grid operators balance customer demand ("load") with power generation to meet these reliability standards. Sometimes there are physical delivery constraints, and the grid operator must "maintain voltage and frequency levels and other technical dimensions of grid performance" with "reserves" that they can turn on with short notice.[51]

Microgrids have "islanding" capacities that make them valuable for balancing loads on a utility's system during favorable "blue-sky" conditions. More importantly, however, microgrids can also assist reliability during "black-sky" emergencies, when the IOU's usual power sources are cut off.[52] While typical rooftop solar is uncommunicative and unresponsive, a microgrid's ability to adjust generation and load allows it to provide smart services that are more finely tuned than traditional demand response or ancillary services. Smart services can be delivered in response to real-time dispatches or market signals.[53]

A second benefit of microgrids that is closely related to reliability is their ability to shift loads. Load shifting can provide not only cost savings to customers, but also to utilities when they can "shave peak load" instead of maintaining old or building new rarely-used infrastructure.[54] As with many commodities, prices increase when demand is higher—think Uber's surge pricing.[55] Similarly, IOUs have to pay a higher price per kilowatt hour for electricity they supply during peak demand, when many customers have above-average electricity use.[56] Sometimes the demand can outstrip supply and cause

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[49] WILLIAM RODGERS, BROWN OUT: THE POWER CRISIS IN AMERICA 11 (1972).
[50] *See* Federal Power Act § 215, 16 U.S.C. § 824(o).
[51] C. Baird Brown, *Financing at the Grid Edge*, *in* LEGAL PATHWAYS TO DEEP DECARBONIZATION IN THE UNITED STATES 151-52 (Michael B. Gerrard & John C. Dernbach eds., 2019).
[52] Martha Davis, *Black Sky Hazards & Grid Resilience*, T&D WORLD (June 15, 2021), https://perma.cc/VY7J-37MC.
[53] Brown, *supra* note 51, at 163-64.
[54] HAW. NAT. ENERGY INST., MAUI SMART GRID DEMONSTRATION PROJECT: FINAL TECHNICAL REPORT (2014), https://perma.cc/7L9F-V3BL.
[55] *How Surge Pricing Works*, UBER, https://perma.cc/37XK-GTVS.
[56] Kathryne Cleary & Karen Palmer, *US Electricity Markets 101*, RES. FOR THE FUTURE, https://perma.cc/X2GW-TKLW (Mar. 17, 2022).

outages.[57] Utilities can respond in two ways. One approach is to build infrastructure that is only used for the few peak-demand hours in a given year.[58] This is both expensive[59] and, in the case of fossil-fuel plants, results in greater environmental risks to vulnerable communities.[60] An alternative response is to try to change customer usage.

A third benefit of microgrids addresses this concept of changing customer usage. Changing customer usage to even out demand and shave the peak load is called "demand response" or "demand-side management." To give customers signals about demand, utilities have adopted "time-of-use" rates that charge more per kilowatt hour during times of traditionally heavier demand.[61] These time-of-use rates can reflect the higher prices the utility may be paying for that peak-demand power[62] and are also designed to change customer energy use.[63] Microgrid systems can save their participants money by storing power and delivering it at a lower rate than the utilities' peak demand rate. This shifting can also help reduce overall load on the grid.[64] In addition, some microgrids send demand-response signals to customers, or directly to customer electronic devices, to determine the best times to, for example, charge electric vehicles (EVs) or run demand-heavy appliances. This, in turn,

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[57] For example, during Winter Storm Uri in Texas, the electricity supply could not meet the demand, resulting in high prices and outages. Joshua Fetcher, *Texas Energy Officials' Proposal to Overhaul the Power Grid Is Drawing Skepticism*, TEX. TRIB. (Nov. 18, 2022, 3:10 PM CST), https://perma.cc/UG2C-E2HG.

[58] On average, "peaker" plants in the United States are only used around 4% of the time, amounting to less than three hundred hours every year. *What is a Peaker Power Plant?*, CLEAN ENERGY GRP. (Jan. 19, 2021), https://perma.cc/6T7J-KNES.

[59] One peaker plant in New Jersey cost ratepayers $13 million over the year to run and maintain the facility when the plant was only used five days in 2010. Abby Gruen, *"Peakers" Plants Provide Electricity When It's Hot, but at the Highest Price*, NJ.COM (July 20, 2010, 11:00 AM), https://perma.cc/5R3X-7LR5.

[60] *See, e.g.*, *Phase Out Peakers*, CLEAN ENERGY GRP., https://perma.cc/AW66-78AR; Rachel Ramirez, *These Dirty Power Plants Cost Billions and Only Operate in Summer. Can They Be Replaced?*, GRIST (May 8, 2020), https://perma.cc/CY8V-JR52.

[61] *See, e.g.*, *State Selector*, XCEL ENERGY, https://perma.cc/U3T8-526F (linking to time-of-use rates for eight states).

[62] Unfortunately, backward looking time-of-use rates do not best promote the use of renewable energy resources, which require dynamic pricing to encourage use when electricity is being generated. K.K. DuVivier & Haley Balentine, *Time of Renewables,* 28 B.U. J. SCI. & TECH. L. 63, 81-86 (2022).

[63] *See, e.g.*, *Understanding the Transition to Time of Use (TOU) Rates on Xcel Energy Electric Bills*, COLO. PUB. UTILS. COMM'N, https://perma.cc/L4DK-WZ96.

[64] Natalie Gregus, *How Load Shifting and Peak Shaving Can Benefit Your Community*, ENERGY LINK (Oct. 19, 2021), https://perma.cc/ZS72-5CKB.

triggers a third benefit of microgrids: reducing emissions by integrating renewable energy and energy demand.[65]

A final benefit of microgrids is that they can offer a promising, often less expensive, solution for areas that are currently not connected to the macrogrid or where grid bottlenecks and aging infrastructure prevent the most effective deployment of renewable energy generation.[66] For example, in February 2023, Duke Energy chose to build a community microgrid in lieu of a second feeder line from the grid to Hot Springs, North Carolina, a remote mountain community of about six hundred.[67] This choice to build a microgrid over traditional wire connections to the macrogrid was newsworthy, but the more significant component of Duke's achievement in Hot Springs was that this microgrid was powered only by solar and batteries.[68] With new inverter technologies, this microgrid could "black start" after an outage without help from fossil fuel generation.[69] By comparison, past microgrid technologies often

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[65] DuVivier & Balentine, *supra* note 62, at 80-85.

[66] *See, e.g.*, GLEN ANDERSEN ET AL., MODERNIZING THE ELECTRIC GRID: STATE ROLE AND POLICY OPTIONS (2021), https://perma.cc/EM4Q-72WH. In addition to promoting clean energy sources and increasing reliability and resilience, other factors that drive customers and developers to pursue microgrids include (1) economic opportunities for a variety of services; (2) enhanced cybersecurity; and (3) the ability to power remote communities. KIERA ZITELMAN ET AL., NAT'L ASS'N OF REGUL. UTIL. COMM'RS, USER OBJECTIVES AND DESIGN APPROACHES FOR MICROGRIDS: OPTIONS FOR DELIVERING RELIABILITY AND RESILIENCE, CLEAN ENERGY, ENERGY SAVINGS, AND OTHER PRIORITIES (2021), https://perma.cc/354H-G99Y; *see also* DANIEL SHEA, MICROGRIDS: STATE POLICIES TO BOLSTER ENERGY RESILIENCE (2022), https://perma.cc/PA5G-DY6U; Brown, *supra* note 51, at 148 (noting participants of grid-connected microgrids can also enjoy a measure of "democratization of electricity generation and energy management"); *id.* at 150 ("The revolution arises not from a single technology, but from integration of multiple technologies that support active management and production of energy at the grid edge."); SHEA, *supra* note 42.

[67] Elisa Wood, *Did Duke Energy Just Change the Game for Community Microgrids?*, MICROGRID KNOWLEDGE (Feb. 6, 2023), https://perma.cc/9CN7-9BMR.

[68] *Duke Energy Places Advanced Microgrid into Service in Hot Springs, NC*, DUKE ENERGY (Feb. 2, 2023), https://perma.cc/2M8Q-DSDZ.

[69] *Black Start*, NAT'L RENEWABLE ENERGY LAB'Y, https://perma.cc/9AL5-WWV3. An inverter is "a device that converts direct current (DC) electricity, which is what a solar panel generates, to alternating current (AC) electricity, which the electrical grid uses. . . . Inverter-based generation can produce energy at any frequency and does not have the same inertial properties as steam-based generation, because there is no turbine involved." *Solar Integration: Inverters and Grid Services Basics*, OFF. OF ENERGY EFFICIENCY & RENEWABLE ENERGY, https://perma.cc/97HX-KSJG. However, inverter technologies until now had issues with "black starts." A black start is "the ability of generation to restart parts of the power system to recover from a blackout. This entails isolated power stations being started individually and gradually reconnected to one another to form an interconnected system again." *Black Start*, *supra* note 69; *see also* Abhishek Banerjee, *Testing Microgrid Solutions to Turn the Lights Back On*, https://perma.cc/6ERN-95V2 (Apr. 12, 2023).

depended on diesel-powered generators,[70] which cause serious air quality[71] and noise pollution problems.[72] Emerging federal and state incentives encourage microgrids that provide resilience to climate change disasters without furthering climate degradation with fossil-fuel generators that add to damaging emissions.[73]

B. Community Microgrids

Community microgrids generally use the same technologies as commercial or military microgrids, but are intended to provide benefits to residents instead of large organizations. While there is no universally accepted definition, one bill introduced in Congress to provide tax credits restricted eligibility based on the entity that owned the microgrid.[74] Eligible persons included state and local governments, Indian tribal governments, Rural Electrification Act cooperatives (co-ops), and certain tax-exempt organizations.[75] Another proposed Congressional approach provided grants to ''community-owned energy systems'' defined as those owned "(A) by the local government where the system is located; (B) by a nonprofit organization that is based in the local jurisdiction where the energy system is located; (C) collectively, by community members; or (D) by a worker-owned or community- owned for-profit entity."[76] Neither of these bills passed the House.

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[70] *See, e.g.*, K.K. DuVivier, *The Law of Distributed Generation in the United States—Conclusions*, *in* DISTRIBUTED GENERATION LAW 353, 355-59 (Sarah A. W. Fitts & Florence K. S. Davis eds., 2020) (noting that the use of fossil fuel generators during power shutoffs is not regulated by the California Air Resources Board or the thirty-five California air management districts, even though some research shows that a single diesel engine operating for only about ten days can increase the cancer risk to residents within one city block by 50%).

[71] *See, e.g.*, David Roberts, *Wildfires and Blackouts Mean Californians Need Solar Panels and Microgrids*, VOX (Oct. 28, 2019, 10:00 AM EDT), https://perma.cc/TD6T-XWQG; Erin Grizard, *Diesel Generators Are Not the Answer to Today's Energy Blackouts*, BLOOM ENERGY (Aug. 1, 2019), https://perma.cc/2R8N-GUUB.

[72] *See, e.g.*, Sarah Miller, *California Is Still Very Dark and Very Loud*, OUTLINE (Nov. 1, 2019, 2:00 PM EST), https://perma.cc/46RW-Q5J7.

[73] *See, e.g.*, S.B. 1339, 2017-2018 Leg., Reg. Sess. §§ 8371(d), 8372(a) (Cal. 2018) (enacted) (encouraging clean microgrids by exempting diesel backup from favorable tariffs).

[74] Making Imperiled Communities Resistant to Outages with Generation That Is Resilient, Islandable, and Distributed Act, H.R. 2482, 117th Cong. (2021).

[75] *Id.* § 6431(b); Rural Electrification Act of 1936, 7 U.S.C. § 901. Generally, these co-ops do not own large electricity generation plants and transmission lines, but instead they purchase bulk power from wholesalers. *Research on the Economic Impact of Cooperatives*, U. WISC. CTR. FOR COOPERATIVES, https://perma.cc/4Y4V-MRUX.

[76] H.R. 448, 117th Cong. § 2 (2021).

On February 9, 2023, the CPUC published a Proposed Decision for rules to implement its Microgrid Incentive Program, which provides $200 million to California utilities to fund "community microgrids in disadvantaged vulnerable communities (DVCs) to support populations impacted by grid outages."[77] Although the eighty-two page Proposed Decision uses the term "community microgrid" twenty-six times, it never provides an explicit definition for the term. It does, however, state that it is "targeted to address the needs of DVCs" and "a portion of an eligible community microgrid is required to be geographically located in an area at a higher risk of electrical outages . . . ."[78] In addition, the Proposed Decision references the Community Microgrid Enablement Program of the Pacific Gas and Electric Company (PG&E), which provides this definition:

> A community microgrid is a group of customers and Distributed Energy Resources (DERs) within clearly defined electrical boundaries with the ability to disconnect from and reconnect to the grid. These microgrids are typically designed to serve the portions of communities that include community resources, such as: hospitals, police and fire stations, and gas stations and markets. . . . PG&E provides prioritized restoration, backup power evaluation, additional communications and other resources before and during power outages to critical facility customers, such as hospitals, police and fire stations, communications services and water providers, who provide services that are essential to public safety.[79]

One of the most ambitious community microgrids to date is a $41 million project to create four sustainable microgrids in Solano County, California.[80]

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[77] Order Instituting Rulemaking Regarding Microgrids Pursuant to Senate Bill 1339 and Resiliency Strategies 2 (Cal. Pub. Util. Comm'n Feb. 9, 2023), https://perma.cc/BZ7V-QVTR. In addition to funding for the community microgrids, the decision permits up to $3 million per project to the utilities in matching funds for utility infrastructure upgrades and for enabling the islanding function. *Id.* at 30-31.

[78] *Id.* at 17, 72.

[79] *Community Microgrid Enablement Program (CMEP)*, PAC. GAS & ELEC. CO., https://perma.cc/Y9YV-WXQE. The website also includes a link to a list of categories of services that the CPUC defines as "critical." *Id.*

[80] *Sustainability Alliance Upgrades Energy Infrastructure in Solano County*, SMART ENERGY INT'L (May 25, 2022), https://perma.cc/5CEU-ZVE6; *see also* Emily Goldfield & Mark Dyson, *Energy Resilience in the Roaring Fork Valley*, HOLY CROSS ENERGY, https://perma.cc/65QL-3VS8; Elisa

After experiencing power shutoffs due to wildfires in 2020 and 2021, Solano County committed to installing microgrids to reliably supply electricity to its important community resources for vulnerable citizens.[81] The projects include installations at the Health and Social Services complex in Fairfield, the Fairfield Civic Center Library, the Juvenile Detention Center in Fairfield, the Vallejo campus, and the William J. Carroll Government Center in Vacaville.[82] In addition to providing resilience, the projects will save Solano County money. Engie, the company that is designing and installing the systems, and that will provide operations and maintenance, has guaranteed that Solano County will save $60 million on its electricity services in comparison to purchasing electricity from its current IOU over the 20-year contract. If power generation targets are not achieved, Engie will pay Solano County back.[83]

C. Challenging the Conventional Utility Structure: The Sunnova Story

Although microgrids as a concept have increasingly gained traction, their implementation still faces obstacles. For example, the CPUC's handling of Sunnova's recent application to operate "public utility microgrids" reflects some of the challenges to come.

In September 2022, Sunnova Community Microgrids California, LLC (Sunnova)[84] filed an application with the CPUC for authorization to operate "public utility microgrids."[85] With this application, Sunnova proposed to serve

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Wood, *8 Communities Breaking New Ground with Microgrids*, MICROGRID KNOWLEDGE (July 27, 2021), https://perma.cc/WP8L-HMHG; *Community Microgrids from All Angles: NREL to Play a Major Part in Microgrid Innovation for American Communities*, NAT'L RENEWABLE ENERGY LAB'Y (Feb. 26, 2021), https://perma.cc/6CXN-28XW.

[81] *Sustainability Alliance Upgrades Energy Infrastructure in Solano County*, *supra* note 80.

[82] *Id.*

[83] *Id.*

[84] Sunnova Community Microgrids California LLC is referred to as SCMC in the pleadings. SCMC is a subsidiary of Sunnova, an energy service provider whose trademark is "Powering Energy Independence." SUNNOVA, https://perma.cc/J2ST-JQP3. Consequently, Sunnova is used universally for both in this Article.

[85] Application of Sunnova Community Microgrids California, LLC for a Certificate of Public Convenience and Necessity to Construct and Operate Public Utility Microgrids and to Establish Rates for Service, Sunnova Community Microgrids, A22-09002 (Cal. Pub. Util. Comm'n Sept. 6, 2022), https://perma.cc/BH4H-C9VV. Sunnova applied for a Certificate of Public Convenience and Necessity, which is the formal documentation used by PUCs to authorize an entity to own and operate a public utility. *See, e.g.*, *Licensing*, CAL. PUB. UTIL. COMM'N, https://perma.cc/N2YE-68U6. The certificate designates the service area as well as the type of utility service to be provided. *Certificate of Public Convenience and Necessity*, ENERGY KNOWLEDGEBASE, https://perma.cc/U5KD-2XM2.

as the utility for newly constructed communities, creating a microgrid alternative to the traditional central-station IOU electricity delivery model.[86]

Sunnova's proposal involved only new communities "built from the ground up."[87] This would seem to avoid one of the loudest—and to critics one of the most spurious—arguments IOUs make against new technologies. When an existing IOU has invested in infrastructure within its service territory, IOUs will argue that alternative infrastructure will force them to charge existing customers more as fixed costs are split among a smaller number of customers. This happened to telephone customers as customers stopped paying for landline telephone service, resulting in a rise in service costs for elderly and others who did not have the resources to purchase cell phones and purchase cell phone services.[88]

However, the argument of cost-shifting to vulnerable existing customers does not hold weight when the IOU has no existing infrastructure in an area. Thus, the argument for exclusive monopoly control to protect "the public" in these new areas falls apart.

Furthermore, the opening of telecommunications to free-market competition resulted in "a host of new technologies" and "the transformation of a digitized value chain . . . new value offerings, new customer identification, and new methods of value capture."[89]

Yet California entities with vested interests in retaining the traditional large-plant monopoly structure of electric utility service piled on to challenge

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[86] Some envision the grid of the future as changing the role of current utilities. Under this vision, the 21st century "smart" electric grid will be a matrix of microgrid "cells" interconnected by the existing transmission and distribution system. CHRISTOPHER VILLAREAL ET AL., CAL. PUB. UTILS. COMM'N, MICROGRIDS: A REGULATORY PERSPECTIVE 9 (Apr. 14, 2014), https://perma.cc/84NM-EDRV.

[87] Reply of Sunnova Community Microgrids California, LLC to Responses and Protests at 25, Sunnova Community Microgrids, A2209002 (Cal. Pub. Util. Comm'n Oct. 20, 2022), https://perma.cc/KQ99-LXP8 [hereinafter Sunnova Reply].

[88] *Price Trends for Wireless and Landline Phone Services, December 2009-September 2015*, U.S. BUREAU OF LAB. STAT.: TED: THE ECON. DAILY (Oct. 28, 2015), https://perma.cc/Q9R2-8KQU. Now it is primarily seniors who still rely on landlines. STEPHEN J. BLUMBERG & JULIAN V. LUKE, NAT'L CTR. FOR HEALTH STAT., WIRELESS SUBSTITUTION: EARLY RELEASE OF ESTIMATES BASED ON DATA FROM THE NATIONAL HEALTH INTERVIEW SURVEY, JULY-DECEMBER 2006 (2007), https://perma.cc/52SV-LLE5. As a result, seniors are facing higher costs. Jacob Vaughn, *Phasing Out Landlines Could Spell Trouble for Seniors and Businesses Both Big and Small*, DALL. OBSERVER (Jan. 17, 2023, 4:00 AM), https://perma.cc/LN8K-SSKA.

[89] MANSHRECK, *supra* note 30, at 191.

Sunnova's application, calling for its outright rejection even without a hearing.[90] As in the rooftop solar contexts discussed below, they used traditional utility regulatory mechanisms in an effort to challenge Sunnova's microgrid alternative.[91] These roadblocks included complicating Sunnova's application by arguing it must be addressed in a delayed rulemaking process.[92] However, the unfinished phase of the rulemaking addresses utility-owned microgrids and not Sunnova's proposal to serve as an independent microgrid utility.[93]

Another argument against the application was that Sunnova must follow the cost-of-service rate structure used by IOUs. As discussed below, the cost-of-service rate structure has many drawbacks including an overemphasis on the construction of large new infrastructure rather than incentivizing maintenance that could prevent fires or more investment in distributed generation or other innovations such as microgrids.[94]

Sunnova proposed terms that were more favorable to customers: long-term contracts with a fixed rate over time, which would help customers avoid the frequent rate-hikes currently imposed by IOUs.[95] Sunnova's rate structure would not only have given customers a competitive alternative to traditional utilities, but also aimed to provide lower service rates and compensation during outages—a benefit no IOU currently offers.[96] Thus, Sunnova's proposal appeared to provide a strong case for an alternative to the traditional monopoly IOU model in undeveloped areas where the utility's main argument doesn't apply.

Nevertheless, on April 10, 2023, the CPUC dismissed Sunnova's application without holding a hearing.[97] In addition to the California Public Advocate Office, powerful incumbents in opposition included California's three major monopoly

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[90] Peter Maloney, *Proposed California PUC Decision Could Scuttle Sunnova's Microgrid Plans*, AM. PUB. POWER ASS'N (Feb. 21, 2023), https://perma.cc/46Z6-X8BY.

[91] *Id.*

[92] S.B. 1339, 2017-2018 Leg., Reg. Sess. § 8372(a) (Cal. 2018) (enacted); *see infra* notes 380-83 and accompanying text.

[93] Sunnova Reply, *supra* note 87, at 4-7.

[94] *See infra* Section II.B.2.

[95] Sunnova Reply, *supra* note 87, at 14-16.

[96] *Id.*; *see also* GLEN ANDERSEN ET AL., 2020-2021 LEGISLATIVE ENERGY TRENDS (2021), https://perma.cc/2GWJ-629S. Connecticut, New Jersey, and Michigan all considered bills to compensate customers in some way for losses due to extended outages. None of these measures passed in 2020. *Id.*

[97] Decision Granting the Public Advocates Office of the California Public Utilities Commission Motion to Dismiss Sunnova Community Microgrids California, LLC's Application Decision 23-04-005, A22-09-022 (Cal. Pub. Util. Comm'n Apr. 10, 2023), https://perma.cc/7P58-WUZK.

IOUs—PG&E, Edison International's Southern California Edison, and Sempra Energy's San Diego Gas & Electric—as well as California's utility union and a consumer advocate group.[98] The result is not surprising considering that the "'notable precedent' [it might have set] threatened the existing utilities."[99] In response, Sunnova's spokesperson noted, "This proposed decision is troubling and disappointing for a state that has set such bold climate targets yet is struggling with making steady progress on them."[100] The following Part will elucidate how this entrenched IOU system came into being.

II. FOR THE SHAREHOLDER OR FOR THE PEOPLE: CREATION OF REGULATED ELECTRIC UTILITY MONOPOLIES

The electric utility model that thwarted Sunnova's innovative microgrid proposal is more than a century old. At the beginning of the twentieth century, running water and electricity became amenities in many American homes. Providing these services with the technologies available at the time required large-scale investment in massive infrastructure. Today, water service remains a largely public enterprise, with 90% of Americans receiving their water from public drinking water systems.[101] In contrast, deft maneuvering by Samuel Insull, one of Thomas Edison's deputies, and others in the early years of electricity led to the current dominant delivery system of private, for-profit, investor-owned, and regulated monopolies.[102] While the public model for the provision of critical services is not always superior,[103] privatization has created different incentives—profits for shareholders over a commitment to the public. Thus, the traditional monopoly for-profit IOU electricity system has used out-of-date rationales to stifle the deployment of innovative technologies and

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[98] *Id.* at 3; Brian Eckhouse, *California Judge Proposes Nixing Plan for Mini-Grids (Correct)*, BLOOMBERG L. (Feb. 16, 2023, 11:05 AM), https://perma.cc/33WF-YN3V.

[99] Eckhouse, *supra* note 98.

[100] *Id.*; *see also* Emma Foehringer Merchant, *California Denies Bid from Home Solar Company to Sell Power as a "Micro-Utility,"* INSIDE CLIMATE NEWS (Apr. 12, 2023), https://perma.cc/64XL-YN3Z. After the decision was finalized, Sunnova also stated that it might appeal and "was evaluating the potential to implement the micro-utility model in [possibly 15] other states . . . ." *Id.*

[101] *Information About Public Water Systems*, U.S. ENV'T PROT. AGENCY, https://perma.cc/4K47-XUR9 (Nov. 15, 2022).

[102] RYAN ELLIS, LETTERS, POWER LINES, AND OTHER DANGEROUS THINGS: THE POLITICS OF INFRASTRUCTURE SECURITY 70 (2020); Lindstrom & Hoff, *supra* note 6.

[103] *See, e.g.*, *Flint Water Crisis*, MICH. DEP'T OF ATT'Y GEN., https://perma.cc/E95V-7QFP.

solutions, such as microgrids, that have the potential to better meet the needs of the public today.

This Part will address four aspects of the evolution of the current U.S. utility model that impact this analysis: (A) the conversion of electricity from a luxury to a necessity; (B) the transition to large, centralized power plants; (C) the emerging recognition of energy justice concerns; and (D) the necessity of Federal intervention to introduce competition to counteract the stifling effect of the current monopoly structure.

A. Luxury vs. Necessity: The Early Days of Competition and Isolated Power Plants

In the area of electricity, several conditions have changed in the last century. Instead of being a luxury, electricity is now a necessity for most Americans. It provides life-saving power to medical devices. It is required for work, communication, and financial transactions. And with increasing electrification of homes, it may one day be the only source of power for heating, cooking, and charging vehicles.

From the beginning, water service was a necessity that impacted both rich and poor, and contamination could mean the difference between life and death. In 1908, Jersey City was the first U.S. city to routinely disinfect community drinking water, and thousands of other cities followed.[104] As a result, cholera and typhoid infections dropped precipitously.[105] In contrast, electricity was a luxury when first introduced—used mostly by the wealthy for illumination—so it was less urgent to make it public.

Many have written about the rise of regulated electric utility monopolies.[106] Some of the technological and cultural difficulties encountered

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[104] *A Century of U.S Water Chlorination and Treatment: One of the Ten Greatest Public Health Achievements of the 20th Century*, CTRS. FOR DISEASE CONTROL & PREVENTION, https://perma.cc/4K9C-RAPD (Nov. 26, 2012).

[105] *Id.*

[106] *See, e.g.*, THOMAS J. FLAHERTY, ROLL-UP: THE PAST, PRESENT, AND FUTURE OF UTILITIES CONSOLIDATION (2022); MANSHRECK, *supra* note 30; PETER KELLY-DETWILER, THE ENERGY SWITCH: ECONOMICS, POLICY, AND ELECTRIC UTILITIES BEFORE 1940 (2016); JOHN F. WASIK, THE MERCHANT OF POWER: SAMUEL INSULL, THOMAS EDISON, AND THE CREATION OF THE MODERN METROPOLIS (2006); HYMAN ET AL., HOW COMPANIES AND CUSTOMERS ARE TRANSFORMING THE ELECTRICAL GRID AND THE FUTURE OF POWER (2021); PETER FOX-PENNER, POWER AFTER CARBON: BUILDING A CLEAN, RESILIENT GRID (2020); JOHN L. NEUFELD, SELLING

when coal was introduced are described above. Similarly, electric lighting, when it was a new technology, also had a difficult time getting established with both technological and cultural concerns.[107] The first electric replacement for gas lighting was the arc lamp, which had its first major public demonstration at the Paris Opera in 1844.[108] An arc lamp produces light when electricity arcs between two metal electrodes—the zap in Frankenstein movies. But early technologies had many drawbacks including glaring light, fumes from the burning carbon,[109] and "'man killing' wires."[110] Culturally, some localities forbade electric lights on buildings because they were considered "low class and unseemly," illuminating "semirespectable establishments."[111]

Some mark "the beginning of the [modern] electric utility industry" as September 4, 1882, when Thomas Edison's Pearl Street Station in New York's financial district illuminated its first four hundred lamps.[112] As with most emerging technologies, competition was fierce. "In the early [1880s], small electric lighting companies popped up like crocuses in spring . . . ."[113] Between 1882 and 1905, Chicago had twenty-nine different franchises, providing different types of services for different purposes, with a range of equipment varying in frequencies from block to block.[114] While some described the state of electricity services at this time as "marked by an anarchic process of polygenesis,"[115] others note that the early competition "prevented the technology of the electric industry from ossifying . . . ."[116] For example, competition sparked innovation in manufacturing and other industries that

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POWER: ECONOMICS, POLICY, AND ELECTRIC UTILITIES BEFORE 1940 (2016); JOHN F. WASIK, THE MERCHANT OF POWER: SAMUEL INSULL, THOMAS EDISON, AND THE CREATION OF THE MODERN METROPOLIS (2006); HYMAN ET AL., *supra* note 7; JILL JONNES, EMPIRES OF LIGHT: EDISON, TESLA, WESTINGHOUSE, AND THE RACE TO ELECTRIFY THE WORLD (2003); HAROLD L. PLATT, THE ELECTRIC CITY: ENERGY AND THE GROWTH OF THE CHICAGO AREA, 1880-1930 (1991); JOHN HOGAN, A SPIRIT CAPABLE: THE STORY OF COMMONWEALTH EDISON (1986); RICHARD RUDOLPH & SCOTT RIDLEY, POWER STRUGGLE (1986).

[107] PLATT, *supra* note 106, at 30; *see, e.g.*, David Nye, *Electricity and Culture: Conceptualizing the American Case*, 2 ANNALES HISTORIQUES DE L'ÉLECTRICITÉ 125, 128-29 (2004); *Lighting a Revolution*, NAT'L MUSEUM OF AM. HIST., https://perma.cc/7VJP-RNK9.

[108] HYMAN ET AL., *supra* note 7, at 117.

[109] *Id.*

[110] PLATT, *supra* note 106, at 30.

[111] *Id.*

[112] HYMAN ET AL., *supra* note 7, at 119.

[113] HOGAN, *supra* note 106, at 12.

[114] HYMAN ET AL., *supra* note 7, at 123.

[115] PLATT, *supra* note 106, at 29.

[116] HYMAN ET AL., *supra* note 7, at 123.

could replace centralized shafts with small electric motors for different pieces of equipment.[117]

In addition, many prosperous cities and households already had invested in infrastructure for gas lights. Electricity was above the means of the average consumer, something that did not change for decades.[118] The institutions that could afford to move to electricity, and increasingly needed to rely on it, built isolated power plants to fuel their own facilities—say a factory or hotel.[119] Just months after the opening of Pearl Street Station, institutions had constructed 334 such localized independent power generation plants.[120]

B. Transition to Large Central Station Systems

While electricity was originally a luxury that was often independently generated, advancements in transmission systems paved the way for widespread access through regulated monopoly IOUs with centralized facilities.

First, this Section will address the role of IOUs in creating our current regulated monopoly model. Second, it will examine the role that lawmakers and regulators have played in making the regulated monopoly model stagnant and slow to respond as well as their role in fighting efforts to allow innovation outside of their regulatory control. Finally, it will address duplication or redundancy, which is often used as a justification for the monopoly structure. While it once may have been wasteful, redundancy now provides benefits and is necessary for resilience to avoid financial loss and loss of lives in responding to interruptions of power due to climate emergencies. Yet utilities and their regulators continue to devalue the resiliency benefits microgrids could provide.

1. Regulated Monopolies: Birth and Ascent to Power

With the birth of Pearl Street Station in 1882, independent power plants generated electricity that was used onsite. But advances in transmission

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[117] *Id.* at 125-26.
[118] *Id.* at 119.
[119] *Id.*; *see also* HOGAN, *supra* note 106, at 13 (noting that the Edison Company for Isolated Lighting sold more than 300 isolated power plants by 1883).
[120] HYMAN ET AL., *supra* note 7, at 119; *see also* HOGAN, *supra* note 106, at 13.

systems minimized losses[121] and provided an alternative model involving three phases: generation, transmission, and distribution. Electricity generation favored building large, centralized facilities that saved resources by creating economies of scale, just as was the case for water processing.[122] The concentration of customers in urban areas also provided opportunities for avoiding duplication or redundancy of resources in delivering water or power. This concentration could avoid the financial and material waste that was passed along to customers through higher prices when different railroads, for example, built out redundant track along the most lucrative lines.[123]

Samuel Insull, an employee of Chicago Edison, masterminded the process that made Edison's central station utility model a reality. Different customers had different electricity needs at various times of day: industrial uses in the daytime, electric streetcars during rush hour, and lighting in the evening. Consolidating these loads into one large generator avoided the redundancy of having three separate small generators for these three types of customers.[124]

Once the generation plants were centralized, utilities needed to build transmission lines to carry the electricity generated at these large central stations to individual customers. Both the centralized generation stations and transmission lines required substantial financial investments. Consequently, financing for transmission and large-scale generation proved challenging to secure[125] and "the financial results [for Edison's private utilities] were unimpressive even thirty years after the pioneering era."[126]

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[121] *See* HOGAN, *supra* note 106, at 29-30. Edison's Direct Current (or DC) technology resulted in huge power losses when transmitted over distances, so smaller localized electricity became the norm. *Id.* Samuel Westinghouse and Nikola Tesla challenged Edison's DC systems with a competing technology, Alternating Current (or AC). *Id.* Because AC transmission did not suffer from the same power losses, it ultimately won the day as the model for most electricity utility development in the United States). *Id.*; *see also* W. Bernard Carlson, *Edison and Tesla's Cutthroat 'Current War' Ushered in the Electric Age*, NAT'L GEOGRAPHIC (Sept. 29, 2019, 8:00 AM BST), https://perma.cc/7GA6-RNXZ.

[122] HYMAN ET AL., *supra* note 7, at 124; *see also* Andrew Loo, *Economies of Scale*, CORPORATE FIN. INST., https://perma.cc/EWB3-ZH9W (Mar. 4, 2023) (defining "economies of scale" as referring to "the cost advantage experienced by a firm when it increases its level of output.") Thus, with greater quantity of output, the per-unit fixed cost per unit decreases.

[123] *Emergence of Electrical Utilities in America*, NAT'L MUSEUM OF AM. HIST., https://perma.cc/22YL-VPNE.

[124] HYMAN ET AL., *supra* note 7, at 121, 124.

[125] *Id.* at 119.

[126] *Id.* at 126.

Although exclusive for-profit franchises for utility monopolies have been the predominant American model for approximately a century, that has not always been the case, nor was this structure inevitable or natural. Initially, the solution for financing the large, centralized water processing or electrical generation facilities was through publicly owned utilities. As mentioned above, 90% of Americans still receive their water from public entities. Electric utilities also began with the public ownership approach. In the early 1920s, there were more than three thousand public municipal electric systems.[127] This, however, did not last. By 1930, that number had fallen by over a third, and currently only about 15% of Americans receive their electricity from publicly owned utilities.[128]

Governments have the ability to finance the large-scale investments that bring economies of scale, and without a profit motive, those same governments can direct cost-savings towards reduced prices or public benefits. However, municipal utilities faced debt-limits and legal obstacles to owning utilities as some needed state legislation authorizing it.[129] Furthermore, the fragmented nature of the U.S. utility industry stood in the way of an interconnected grid.[130]

In the early twentieth century, IOUs saw that money could be made in the strongest markets and began arguing that regulated monopolies were a better model for electricity delivery than publicly owned utilities. Samuel Insull first floated the idea of making electric utilities regulated monopolies in an 1898 address before the National Electric Light Association, an organization over which he presided as president.[131] Richard T. Ely, an economist writing in 1911, also argued some industries constituted "natural monopolies" because they required large capital investments that rendered "effective and permanent competition" impossible.[132]

These regulated-monopoly arguments are counter-intuitive. The public is generally wary of monopoly power, and most private corporations resist regulation. In *Munn v. Illinois*, a grain elevator became the first monopoly

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[127] Delia Patterson, *Public Power: A Rich History, a Bright Future*, AM. PUB. POWER ASS'N (Feb. 15, 2018), https://perma.cc/YZ5K-MPTA.

[128] Lindstrom & Hoff, *supra* note 6.

[129] DAVID SCHAP, MUNICIPAL OWNERSHIP IN THE ELECTRIC UTILITY INDUSTRY: A CENTENNIAL VIEW 27-28 (Praeger Publishers 1986).

[130] FLAHERTY, *supra* note 106, at 11.

[131] HOGAN, *supra* note 106, at 36-37.

[132] RICHARD T. ELY, STUDIES IN THE EVOLUTION OF INDUSTRIAL SOCIETY 225 (Macmillan 1911), https://perma.cc/H7NM-9K2B.

regulated as a "public utility" in the United States.[133] The State of Illinois passed a statute that controlled the grain elevator prices. In response, the operators argued that Illinois had no authority to prevent them from charging high rates for grain storage because they were private companies, and thus, private operations. Illinois argued that even though the ownership of the property was private, "the use may be public in a strict, legal sense" if the operators "pursue a public employment" by holding a monopoly on grain storage.[134] The U.S. Supreme Court agreed with Illinois and summarized by saying, "[W]hen private property is devoted to a public use, it is subject to public regulation."[135]

Insull turned this argument on its head by taking an industry that was not a monopoly—which electric utilities were not at the time of his advocacy—and making it a monopoly through regulation.[136] About a decade and a half after Insull first floated the idea of regulating electric utilities as natural monopolies, the political stars converged to embrace the idea.[137] Unlike the situation in *Munn*—where a company came under regulation because it was a monopoly[138]—electric companies became monopolies as a result of becoming regulated.[139] "In other words, the utility management may have sought regulation to maintain profitability."[140]

The corruption of municipal officials in receiving bribes and kickbacks for granting private franchises "at the expense of 'consumer interests'" led a coalition of reformers and industry leaders to advocate for statewide regulation of electric utilities.[141] Regulation attempted to guarantee reliability and stability through a rate structure that encouraged the buildout of large infrastructure by guaranteeing set returns on whatever a utility spent. This standard rate

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[133] Munn v. Illinois, 94 U.S. 113 (1876); *see* Gustavus H. Robinson, *The Public Utility Concept in American Law*, 41 HARV. L. REV. 277, 294 (1928) ("[T]he phrase has developed a clear content since Munn's time, and is the epitome of another set of explanations upon the question what is or may be made to be a public utility.").

[134] *Munn*, 94 U.S. at 122.

[135] *Id.* at 130.

[136] Richard D. Cudahy & William D. Henderson, *From Insull to Enron: Corporate (Re)Regulation After the Rise and Fall of Two Energy Icons*, 26 ENERGY L.J. 35, 46-51 (2005). *See generally* WASIK, *supra* note 106.

[137] DOUGLAS D. ANDERSON, REGULATORY POLITICS AND ELECTRIC UTILITIES 56 (1981).

[138] *Munn*, 94 U.S. at 127-33.

[139] *See generally* Werner Troesken, *The Institutional Antecedents of State Utility Regulation: The Chicago Gas Industry, 1860 to 1913*, *in* THE REGULATED ECONOMY: A HISTORICAL APPROACH TO POLITICAL ECONOMY 55 (Claudia Goldin & Gary D. Libecap eds.,1994).

[140] HYMAN ET AL., *supra* note 7, at 130-31.

[141] SCHAP, *supra* note 129, at 22.

regulation is called "cost-of-service" ratemaking. In the early years, electric utilities were able to reduce rates 55% and thrive by expanding and adopting fossil-fuel technologies that were larger and more efficient at the time,[142] increasing electrical output from 5.9 million kilowatt hours (kWh) in 1907 to 75.4 million kWh in 1927.[143]

The focus on returns for investors—rather than on public service—grew because despite the stability of regulation, electric utilities still failed to generate impressive profits and became targets for acquisition by holding companies. Holding companies do not conduct business but are just created to buy other companies that they then control, often focusing not on the mission of the companies they hold but on the profits they can eke out of them for shareholders. While states could regulate an intrastate utility, the U.S. Supreme Court made it clear that they did not have the power to control interstate commerce conducted by the holding companies.[144] The holding companies stifled competition, as the number of operating companies decreased from 6,355 to 4,409 in just the five years between 1922 and 1927.[145] In 2021, there were only 168 operating IOUs in the United States,[146] averaging over half a million customers each and operating primarily in lucrative, densely populated regions of the country.[147]

While many of the rationales for private IOU-owned large central-station generation plants were persuasive, they alone did not result in the private IOU model that now dominates the U.S. electricity market. Instead, the industry suffered from the chaos of a non-standardized system and the corruption of legislators who might mandate some order.[148] Ultimately, it would take "negotiations with city councils . . . , bribes, and delays in sales until the system

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[142] Coal-fired plants were the main technology for large power plants in the early twentieth century aside from hydropower dams, which were very limited by location near an appropriate water source. HYMAN ET AL., *supra* note 7, at 121.

[143] MATTHEW H. BROWN & RICHARD P. SEDANO, ELECTRICITY TRANSMISSION 3 (2004), https://perma.cc/W8QT-8BY9.

[144] Pub. Utils. Comm'n of R.I. v. Attleboro Steam & Elec. Co., 273 U.S. 83, 89-90 (1927).

[145] HYMAN ET AL., *supra* note 7, at 139.

[146] *Number of Electricity Providers in the United States in 2021, by Ownership Type*, STATISTA (Jan. 25, 2023), https://perma.cc/LFJ8-8BM2.

[147] Kevin Randolph, *EIA: Investor-Owned Utilities Served 72 Percent of US Electricity Customers in 2017*, DAILY ENERGY INSIDER (Aug. 19, 2019), https://perma.cc/86HG-6NZ5. The number had dropped to less than fifty electric companies by 2023. FLAHERTY, *supra* note 106, at 10.

[148] HYMAN ET AL., *supra* note 7, at 123.

was completed" to make the IOU model the norm.[149] As an example of the scope of corruption, one Edison representative "set aside a $500,000 slush fund to buy the votes of state senators and representatives" in 1897.[150]

Sadly, IOUs and their trade organizations remain some of the most influential lobbying interests in the United States today, and some utilities have been found to engage in bribery.[151] In 2021, IOUs spent more than $124 million on lobbying, second only to oil and gas interests.[152] In contrast, the "alternative energy" sector spent about $24 million in 2021, up from only about $7 million on lobbying in 2018.[153]

In 2020, PG&E in California pled guilty to eighty-four counts of involuntary manslaughter in the Camp Fire of 2018[154] and has been accused of sparking at least 1,500 more fires because of lack of maintenance of its lines[155] when it knew about this danger for years.[156] Yet, PG&E defended prioritizing payments of $5.3 million in dividends to investors and campaign contributions to politicians over investing in desperately needed equipment maintenance or replacement and wildfire-prevention measures.[157]

ProPublica has identified at least four ways in which utilities have used their clout to promote their private interests over that of ratepayers.[158] The first category, "Secret Political Spending," involves potential criminal activity. For example, authorities in Ohio alleged that FirstEnergy contributed $60 million to an entity overseen by Ohio House Speaker Larry Householder. Householder was convicted of racketeering for taking this money in exchange for promoting

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[149] *Id.* at 119.

[150] HOGAN, *supra* note 106, at 51.

[151] J. DAVID LIPPEATT ET AL., BLOCKING ROOFTOP SOLAR: THE COMPANIES, LOBBYISTS AND FRONT GROUPS UNDERMINING LOCAL CLEAN ENERGY (2021), https://perma.cc/K3FQ-ABUX.

[152] *Electric Utilities: Lobbying, 2022*, OPEN SECRETS, https://perma.cc/P3K9-JLJD.

[153] *Alternative Energy Production & Services: Lobbying, 2022*, OPEN SECRETS, https://perma.cc/8EKN-8RVL.

[154] *See, e.g.*, Dan Whitcomb, *PG&E Pleads Guilty to 84 Counts of Involuntary Manslaughter in California Wildfire,* REUTERS (June 16, 2020, 12:22 PM), https://perma.cc/HW9A-2C4M; *see also* Katherine Blunt, *Inside the Investigation That Secured a Guilty Plea for 84 Wildfire Deaths*, WALL ST. J. (Aug. 25, 2022, 10:00 AM ET), https://perma.cc/8X7F-XNQB.

[155] Russell Gold et al., *PG&E Sparked at Least 1,500 California Fires. Now the Utility Faces Collapse.*, WALL ST. J. (Jan. 13, 2019, 3:19 PM ET), https://perma.cc/8N8S-5T25.

[156] Katherine Blunt & Russell Gold, *PG&E Knew for Years Its Lines Could Spark Wildfires, and Didn't Fix Them*, WALL ST. J. (July 10, 2019, 10:28 AM ET), https://perma.cc/DZ7S-WJ4Q.

[157] *See, e.g.*, Nicholas Iovino, *PG&E Defends Spending on Investors, Politicians as Fires Sparked,* COURTHOUSE NEWS SERV. (July 31, 2019), https://perma.cc/8KVA-W99Q.

[158] Patrick Wilson, *Four Types of Scandals Utility Companies Get into with Money from Your Electric Bills*, PROPUBLICA (Oct. 10, 2020, 5:00 AM EDT), https://perma.cc/4FBW-Y385.

legislation that provided a billion-dollar bailout for FirstEnergy's failing nuclear power plants as well as reducing renewable energy standards and energy efficiency programs that FirstEnergy viewed as competition.[159] Similarly, the FBI and U.S. Attorney's Office have investigated Arizona Public Service for donating millions to "dark money" organizations that helped elect two state utility regulators in 2014. These candidates won and in 2017 voted for a utility-backed rate increase.[160] Another category is "Creating the Appearance of Public Support."[161] In one egregious example, Entergy was fined $5 million for allowing one of its contractors to pay people to show up at New Orleans City Council meetings to create the appearance of community support for a new natural gas plant that Entergy wished to build.[162]

2. Legislator or Regulator Complicity

While the use of IOU clout and money are probably the primary drivers for stifling innovation that might threaten competition, legislators and regulators share some complicity in the outcome. On the legislator side, ProPublica's list of ways in which utilities use their clout is "Offering Jobs to Allies." As an example, it notes that Commonwealth Edison, the largest electric utility in Illinois, paid the Illinois House Speaker more than $1.3 million for subcontracts and job payments to associates of the House Speaker in return for his support on a bill that provided Commonwealth Edison with more than $150 million in benefits.[163]

ProPublica's fourth category is "Undertaking Mega Projects That Don't Pan Out." While this strategy is usually not illegal because it is justified by the cost-of-service rate structure under which most IOUs are regulated, it has probably cost ratepayers more than any of the others. For example, SCANA Corp. in South Carolina proposed to build a nuclear power plant. The project was

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[159] Press Release, U.S. Att'y's Office, S. Dist. of Ohio, Jury Convicts Former Ohio House Speaker, Former Chair of Ohio Republican Party of Participating in Racketeering Conspiracy (Mar. 9, 2023), https://perma.cc/N9GS-TSWK.

[160] Wilson, *supra* note 158.

[161] *Id.*

[162] *Id.*; *see also* Sam Brasch, *Xcel Energy Played a Leading Role in a Stealthy Plan to Defend Natural Gas in Colorado*, CPR NEWS (Feb. 27, 2023, 3:55 AM), https://perma.cc/M2DE-GRSC (reporting that electric utility promoting itself as "green" made major contributions to a non-profit dedicated to fighting for natural gas against a growing movement toward electrification of buildings).

[163] Wilson, *supra* note 158.

canceled in 2017, but utility customers are still on the hook for $2 billion that SCANA is permitted to collect through their rates.[164]

Regulators created cost-of-service ratemaking to calculate how high rates should be to guarantee an IOU's revenue. The cost-of-service model has produced problems because it awards IOUs a guaranteed rate of return on physical assets. As a result, the process incentivizes IOU investment only in their IOU-owned assets (wires, generators, meters, software). It also disincentives any displacement of IOU assets by customer-owned or third-party non-wires resources such as rooftop solar or behind-the-meter storage.[165]

Utility reform ideas have been floated for over a decade,[166] but none have radically changed the traditional cost-of-service incentives in most markets.[167] Eventually, some of these changes might encourage a utility to embrace partnerships with third-parties for microgrid expansion, and some microgrid developers might see a utility-as-partner model as its best chance to infiltrate IOU monopoly strangleholds in certain territories.[168] However, such "if you can't beat them, join them" strategies encourage "mission creep" of utilities into areas beyond their primary role of delivering electrons, and because the

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[164] *Id.*

[165] Brown, *supra* note 51, at 152.

[166] *See, e.g.*, PETER FOX-PENNER, SMART POWER: CLIMATE CHANGE, THE SMART GRID, AND THE FUTURE OF ELECTRIC UTILITIES (2010); MANSHRECK, *supra* note 30; NAT'L RENEWABLE ENERGY LAB'Y, DECOUPLING POLICIES: OPTIONS TO ENCOURAGE ENERGY EFFICIENCY POLICIES FOR UTILITIES (2009), https://perma.cc/7X9C-NHNG; SCOTT HEMPLING, REGULATING PUBLIC UTILITY PERFORMANCE: THE LAW OF MARKET STRUCTURE, PRICING AND JURISDICTION (2d ed. 2021); David J. Unger, *"Platform" Model Will Be Key for Illinois' Future Power Grid*, ENERGY NEWS NETWORK (Oct. 5, 2017), https://perma.cc/S2FU-FKBC; MEDSIS Staff Report, FORMAL CASE NO. 1130, Modernizing the Energy Delivery System for Increased Sustainability, FC 1130 (Pub. Serv Comm'n D.C. Jan. 25, 2017), FC 1130-2017-M-88, https://perma.cc/M8UL-E33P; Order on Net Energy Metering Transition, Phase One Value of Distributed Energy Resources, and Related Matters, In the Matter of the Value of Distributed Energy Resources, 15-E-0751 (N.Y. Pub. Servs. Comm'n Mar. 9, 2017); LESTER R. BROWN ET AL., THE GREAT TRANSITION: SHIFTING FROM FOSSIL FUELS TO SOLAR AND WIND ENERGY (2015).

[167] *See e.g.*, Chloe Holden, *More States Explore Performance-Based Ratemaking, but Few Incentives Are in Place*, GREENTECH MEDIA (June 13, 2019), https://perma.cc/2MU5-FQVY; *see also* Gennelle Wilson et al., *States Move Swiftly on Performance-Based Regulation to Achieve Policy Priorities*, RMI (Mar. 31, 2022), https://perma.cc/VS66-GZJV (noting that although performance-based regulation (PBR) is seen as a promising alternative and has "gained significant traction" since 2020, it is still only implemented in a minority of states (seventeen) and there is not a clear success plan as regulators and utilities are "building the plane while flying it").

[168] Sara C. Bronin & Paul R. McCary, *Peaceful Coexistence: Independent Microgrids Are Coming*, PUB. UTILS. FORT., Mar. 2013, at 40.

utilities may be picking winners and losers, can result in higher prices for customers and stifling of innovation that market competition would allow.[169]

3. Recognizing the Value of Redundancy

One example of regulator resistance towards microgrids is how the electrical system values, or fails to value, resiliency.[170] At the turn of the twentieth century, avoiding redundancy, or duplication of infrastructure, was one of the main drivers for transitioning from independent power generation plants to the large, centralized station model. To justify their "natural monopolies," IOUs argued that competition results in "wasteful duplication" of investment,[171] leading to inefficient service and high rates.[172]

These ideas are incorrect in today's world. First, they presume that redundancy is wasteful. But the climate of today is not what it was a century ago. Violent storms and fires are causing more outages.[173] Furthermore, instead of being "waste," redundancy now has become a critical positive asset due to the increased reliance on electricity for everything from payments to communication to medical devices, and electricity's growing role for transportation and home heating and cooling.[174]

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[169] Troy A. Rule, *Utility Mission Creep*, 56 U.C. DAVIS L. REV. 591, 599, 628 (2022); *see also* Lisa Cohn, *Solar, Microgrid Developers Say Xcel Has Monopoly Advantage in New Minnesota Resiliency Program*, MICROGRID KNOWLEDGE (May 5, 2023), https://perma.cc/RW63-BH4C.

[170] THINK MICROGRID, MICROGRIDS: AN IMMEDIATE CLIMATE SOLUTION 16 (2022), https://perma.cc/GB6A-ETGZ.

[171] Aditya Bamzai, Comment, *The Wasteful Duplication Thesis in Natural Monopoly Regulation*, 71 U. CHI. L. REV. 1525 (2004) (exploring the validity of the wasteful duplication thesis in the context of rent dissipation).

[172] *See also* PW Ventures, Inc. v. Nichols, 533 So. 2d 281, 283 (Fla. 1988) ("[Florida law] directs the PSC to exercise its powers to avoid 'uneconomic duplication of generation, transmission, and distribution facilities.' If the proposed sale of electricity by PW Ventures is outside of PSC jurisdiction, the duplication of facilities could occur. What PW Ventures proposes is to go into an area served by a utility and take one of its major customers. Under PW Ventures' interpretation, other ventures could enter into similar contracts with other high use industrial complexes on a one-to-one basis and drastically change the regulatory scheme in this state. The effect of this practice would be that revenue that otherwise would have gone to the regulated utilities which serve the affected areas would be diverted to unregulated producers. This revenue would have to be made up by the remaining customers of the regulated utilities since the fixed costs of the regulated systems would not have been reduced.").

[173] Matthew Brown et al., *Storms Batter Aging Power Grid as Climate Disasters Spread*, ASSOCIATED PRESS NEWS (Apr. 5, 2022), https://perma.cc/2FJV-BRXB.

[174] *See, e.g.*, Justin Mulfati, *How Redundancy Is Key in Reducing Blackout Hours*, DCBEL (Sept. 21, 2021), https://perma.cc/CEV3-WK6N.

Despite the increased reliance on electricity and the ability of microgrids to deliver needed backup, "reliability standards do not adequately account for the reliability of [such] sources."[175] The National Council of State Legislators has observed that energy resilience policies are "often difficult to pass."[176] This is true because "they tend to require costly investments in infrastructure."[177] In addition, "the return on investment is difficult to quantify; there is no widely accepted metric for valuing the *damage that isn't done*, or energy *services that aren't interrupted* as a result of resiliency spending."[178] The additional fallacies of the competition-as-waste arguments are that they presume IOUs could not compete, which would result in inefficient service. These arguments also assume that IOU assets are stagnant and that costs for alternatives would therefore be borne solely by remaining customers. However, customers are currently paying for utilities to retire fossil fuel assets to build new low-carbon alternative infrastructure,[179] and in jurisdictions where customers opt out of utility service, they often must pay "exit fees" also called Power Charge Indifference Adjustment fees in California.[180]

In conclusion, a number of factors may account for a bias of state regulators for retaining the status quo, including job security for government employees and contractors, regulatory capture,[181] belief in the benefit of regulation, and lack of authority to regulate more extensively or in a different manner. Regardless of the motivation, this bias helps explain the rejection of Sunnova's microgrid utility application and the almost insurmountable powers that are preventing deployment of alternative ways to provide power for consumers. This impediment will continue to stand until legislatures and regulators can

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[175] Klass et al., *supra* note 46, at 1045. One way to better value resiliency might be to assess stronger non-performance penalties for outages. Interview with Joshua Macey, Assistant Professor of L., U. Chi., in Phx., Ariz. (May 11, 2023)

[176] ANDERSEN ET AL., *supra* note 96.

[177] *Id.*

[178] *Id.* (emphasis added); *see also* Joel B. Eisen et al., *Virtual Energy*, ILL. L. REV. (forthcoming 2024) (manuscript at 17-23), https://perma.cc/UKS2-WS4M (noting utility conflict of interest in measuring reliability and arguing for Independent Distribution System Operators).

[179] *See, e.g.*, Scott Van Voorhis, *Xcel Plans to Roll Out 10,000 MW of Renewable Energy in Minnesota, Colorado by 2030*, UTILITY DIVE (July 30, 2021), https://perma.cc/E29P-45BC.

[180] *See, e.g.*, Linda Dailey Paulson, *CCA Board Members Petition CPUC to Resolve Exit Fee Issues Immediately*, CAL. ENERGY MKTS., https://perma.cc/4T6A-8ZBV (Oct. 2, 2020).

[181] *See, e.g.*, ELIN CHERRY & ROBERT W. DANNHAUSER, CORRUPT OR COLLABORATIVE?: AN ASSESSMENT OF REGULATORY CAPTURE 1 (2016), https://perma.cc/X9WM-6N5T ("Regulatory capture refers to the corruption of the regulatory process such that the public good is sacrificed in favor of the commercial interests of the regulated entity.").

recognize the disproportionate influence entrenched stakeholders wield and until they can better appreciate the value of redundancy in providing reliable and resilient electric power.

C. Energy Justice: "Just the Way It's Always Been" Is Not the Way the Future Should Be

There is increased concern for the inequities of the current electricity model. Perhaps most importantly, there is an alternative to isolated coal-fired plants that emit toxic pollutants to those in the immediate vicinity. New technologies allow clean generation of electricity onsite using solar panels that provide this power silently, without the need for water or harmful byproducts.[182] The electricity generated can also be stored onsite—either as electricity in batteries or as heat in appliances such as electric water heaters, both of which can later deliver that electricity or heat on demand. Sophisticated microgrid controllers can also now regulate the flow of power by making adjustments to avoid overdemand and shortages.[183] These new technologies can provide opportunities to redress both environmental and energy injustices.

In one instructive example, a non-profit church in North Carolina worked with a third-party to install solar panels on its roof to provide clean energy to offset some of the parish's soaring electricity bills.[184] Duke Energy, the IOU that held the electricity franchise for the area encompassing the church, petitioned the North Carolina Utilities Commission to issue a cease and desist order and fine the non-profit up to $1,000 per day for every day it sold power to the church.[185] When asked whether this result seemed unfair because of the energy justice concerns, Duke's communications manager responded, "I think that's just the way it has been."[186] However, "just the way it's always been" does not justify the way the future should be. Energy justice has been essentially forgotten in the story of the shift from publicly owned electric utilities to for profit IOUs.

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[182] GARVIN HEATH ET AL., ENVIRONMENTAL AND CIRCULAR ECONOMY IMPLICATIONS OF SOLAR ENERGY IN A DECARBONIZED U.S. GRID 19, 34 (2022), https://perma.cc/99AV-FEM6.

[183] Kevin B. Jones et al., *The Urban Microgrid: Smart Legal and Regulatory Policies to Support Electric Grid Resiliency and Climate Mitigation*, 41 FORDHAM URB. L.J. 1695, 1703-04 (2014).

[184] State *ex rel.* Utils. Comm'n v. N.C. Waste Awareness & Reduction Network, 805 S.E.2d 712, 714 (N.C. Ct. App. 2017).

[185] *Id.* For more discussion of utility warfare against rooftop solar, see *infra* Part IV.

[186] JONATHAN SCOTT'S POWER TRIP (Scott Bros. Ent. 2020).

The relationship between regulated monopolies and their regulators is sometimes characterized as a "regulatory compact" even though there is no formal contract nor is the agreement generally codified into law.[187] The benefits to the IOU are exclusive service territories and rates that provide assurance of a fair rate of return on the utility's investments.[188] In exchange, the utility allows scrutiny of its finances by regulators and regulatory approval of rate increases.[189]

Another component of the compact is that an IOU has an obligation to serve all customers within its exclusive service territory. This is generally not a major imposition because IOUs have significant discretion in defining their territories and generally manage to keep the boundaries focused on the most condensed and profitable markets. This is illustrated by the fact that IOUs did not believe that providing power to remote areas of the United States was economically lucrative, and they chose not to encompass rural customers within their territories.[190] In 1936, 90% of rural Americans had no access to electricity.[191] Federal legislation was required, through the Rural Electrification and Telephone Service Act of 1936,[192] to finally bring electricity to these areas, mostly through electric co-ops, which now provide power to approximately 13% of the U.S. population.[193] The 1936 Act, which worked around the for-profit motive, resulted in a dramatic turnaround; in less than fifteen years, 80% of rural America finally had access to electricity.[194]

In addition, the large, centralized power stations created a disconnect between the benefits of electricity and the externalities of air and water pollution caused by burning coal. In the time of isolated power plants, the entities that needed the power also suffered the detriments of coal combustion adjacent to their facilities. In some ways this was especially ironic as a hospital that needed electricity was contributing to the breathing problems of its patients by having an onsite coal generation facility. Moving power generation

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187 *Regulatory Compact*, ENERGY KNOWLEDGEBASE, https://perma.cc/T6V7-JCSY.
188 *Id.*
189 *Id.*
190 Brandon McBride, *Celebrating the 80th Anniversary of the Rural Electrification Administration*, U.S. DEP'T OF AGRIC. (May 20, 2016), https://perma.cc/8FCM-3L5K.
191 *Id.*
192 Rural Electrification Act of 1936, 7 U.S.C. § 901 (2022).
193 Lindstrom & Hoff, *supra* note 6.
194 McBride, *supra* note 190.

to remote areas may have been justified because it lowered costs and removed the harm from more densely populated areas.

However, moving generation away from more affluent areas has resulted in a disproportionate burden of environmental harms and adverse health impacts on minority, low income, and indigenous communities.[195] Furthermore, these populations are disproportionately harmed by the upstream extraction of electrical fuel such as coal, natural gas, and uranium.[196] Ultimately, climate change has and will also cause the most harm to many of these same groups who also suffer from energy insecurity and are least able to absorb IOU rate hikes. These issues raise environmental justice concerns. Community microgrids could provide these groups with a critical electricity safety net when the power goes out as well as an opportunity for more choice or control over the rates they pay. Microgrids have a better chance of meeting these goals in a competitive environment, something the federal government has attempted to foster in the electric utility space.

D. Federal Introduction of Competition

Due to their influence in state politics, IOUs eventually controlled every phase of electricity production from generation at a power plant to transmission over long distance wires to distribution into homes and businesses.[197] From the beginning, monopoly IOUs worked hard to stifle competition.[198] Senator George Norris of Nebraska[199] believed "[t]he power trust is the greatest monopolistic corporation that has been organized for private greed," and he accused them of "buying legislatures, clergymen, and even the Boy Scouts."[200]

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[195] *Power Plants and Neighboring Communities*, U.S. ENV'T PROT. AGENCY, https://perma.cc/H2NA-S4JZ (May 11, 2023).

[196] Diana Hernández, *Sacrifice Along the Energy Continuum: A Call for Energy Justice*, 8 ENV'T JUST. 151, 152 (2015).

[197] HYMAN ET AL., *supra* note 7, at 146 ("Central station generators furnished only 40% of electricity at the turn of the century . . . [but] 80% in the Great Depression. . . . [R]egulation . . . began at the behest of civic leaders and of important industry leaders.")

[198] *Id.* at 136 (describing Morris Cooke's Great Power Survey scheme).

[199] Partially as a result of Senator Norris's advocacy, Nebraska is the only state that has never been served by a privately-owned electric IOU. *The Legacy of Senator George Norris*, NEB. DEP'T OF ENV'T & ENERGY Q. NEWSL., Mar. 2019, https://perma.cc/8HVW-6C27.

[200] HYMAN ET AL., *supra* note 7, at 146; *see also* HOGAN, *supra* note 106, at 51.

While a few electric utilities voluntarily agreed to share some resources,[201] federal government intervention was required to loosen the IOU stranglehold. Public opinion turned against them when holding company securities crashed shortly after 1929, and Franklin D. Roosevelt rode the tide of public sentiment in promising to reform them in his 1932 presidential campaign.[202] FDR's administration promoted public power[203] and enacted the Public Utility Holding Company Act of 1935. This legislation not only broke up some holding companies and placed others under strict regulation by the SEC, but also required submission of financial reports and approval to issue securities.[204] As a result, over seven hundred companies were separated from holding company systems, and the overall number of holding companies dropped from 216 in 1938 to only 18 twenty years later.[205]

Things stabilized for IOUs from 1945 to 1965, but the natural monopoly construct was not without its critics even in its early years. A 1998 report by the Congressional Research Service noted, (1) "there is *nothing natural about a utility's monopoly* . . . because exclusive franchises . . . are *granted by government*," and (2) many publicly owned utilities have been able to meet their customers' needs with "*contractual arrangements, rather than unified control*."[206]

After 1965, IOUs, which generated over 75% of customer kilowatt hours (kWh) by 1980,[207] faced pressures that were exacerbated by their choice to build "bigger and more expensive power stations that did not work as well as their predecessors."[208] The standard cost-of-service ratemaking formula,

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[201] In 1927, Philadelphia Electric, Pennsylvania Power and Light, and New Jersey's Public Service Electric and Gas created the first regional transmission network, the PNJ Interchange. HYMAN ET AL., *supra* note 7, at 136.

[202] Franklin D. Roosevelt declared that "the Ishmael or Insull whose hand is against every man's, declines to join in achieving an end recognized as being for the public welfare . . . ." President Franklin Delano Roosevelt, Speech at the Commonwealth Club in San Francisco, California (Sept. 23, 1932), *in Franklin Delano Roosevelt, Speech at San Francisco (1932)*, PEARSON, https://perma.cc/X7Z4-N3H6.

[203] The Bonneville Project Act of 1937, 16 U.S.C. § 832 (1937).

[204] Public Utility Holding Company Act of 1935, 15 U.S.C. § 79, *repealed by* Energy Policy Act of 2005, Pub. L. 109-58, Title XII, § 1263, 119 Stat. 974.

[205] HYMAN ET AL., *supra* note 7, at 148.

[206] AMY ABEL, ELECTRICITY RESTRUCTURING BACKGROUND: THE PUBLIC UTILITY REGULATORY POLICIES ACT OF 1978 AND THE ENERGY POLICY ACT OF 1992, at 2 (1998), https://perma.cc/5P45-SPBG (emphasis added).

[207] HYMAN ET AL., *supra* note 7, at 165 tbl.19-2.

[208] *Id.* at 165 ("[O]ther factors mentioned were finances and environmental concerns . . . .").

addressed above, allows utilities to receive a guaranteed return on investment in "rate base" infrastructure. Therefore, investing money in assets is generally a safer strategy for profits than putting effort into operating more efficiently.[209]

This rate structure for compensating regulated IOUs has been criticized for over sixty years. For example, the Averch-Johnson effect notes that utilities need not be efficient and are disincentivized to be innovative because the rate formulas primarily motivate raising the rate base by investing in more massive and expensive infrastructure.[210] One source notes, "advocates of technical improvement rarely address . . . whether the party that would have to implement the change has an economic incentive to do so, or whether politically or economically powerful stakeholders have reason to oppose implementation via the legal or regulatory processes."[211]

The Public Utility Regulatory Policies Act of 1978 (PURPA)[212] was the first federal effort to seriously challenge the independence of the traditional vertically-integrated IOU monopoly. PURPA was enacted during the Carter administration in response to U.S. energy vulnerabilities exposed by the Middle Eastern Oil Embargo of 1973-74.[213] Among its provisions, PURPA introduced competition at the generation end of the utility cycle by creating a new class of electricity generators called "qualifying facilities" (QFs).[214] PURPA required IOUs to purchase electricity from QFs.[215] IOUs fiercely challenged PURPA in the courts, but the QF provisions survived judicial scrutiny.[216]

The Reagan era brought in a wave of deregulation in several sectors, including transportation and natural gas.[217] Rising rates, caused by expensive

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[209] *Id.* at 482-83.

[210] *See, e.g.*, 2 ALFRED E. KAHN, THE ECONOMICS OF REGULATION: PRINCIPLES AND INSTITUTIONS 106-108 (John Wiley & Sons, Inc. 1970-71).

[211] HYMAN ET AL., *supra* note 7, at 482.

[212] Public Utility Regulatory Policies, 16 U.S.C. §§ 2601-2645.

[213] Michael Corbett, *Oil Shock of 1973-74*, FED. RESERVE HIST. (Nov. 22, 2013), https://perma.cc/GQZ3-9R3G.

[214] *The Public Utility Regulatory Policies Act of 1978*, SOLAR ENERGY INDUS. ASS'N (Feb. 2018), https://perma.cc/32RD-R2WQ.

[215] Public Utility Regulatory Policies Act of 1978, 16 U.S.C. § 824a-3 .

[216] *See* Fed. Energy Regul. Comm'n v. Mississippi, 456 U.S. 742 (1982). However, subsequent federal legislation reduced some of the IOU requirements to purchase electricity created by QFs. *See, e.g.*, Energy Policy Act of 2005, 42 U.S.C. § 15801; Trevor D. Stiles, *Regulatory Barriers to Clean Energy*, 41 U. TOL. L. REV. 923, 929, 935 (2010).

[217] J.D. Steelman Jr., *Deregulation of the Natural Gas Industry*, FOUND. FOR ECON. EDUC. (June 1, 1986), https://perma.cc/63MW-EQ7V.

and sometimes unused infrastructure,[218] as well as reliability concerns, made electric utilities a ripe target for deregulation by the 1990s. In the generation space, the Energy Policy Act of 1992 opened the door to additional competition by repealing restrictions in the Public Utility Holding Company Act of 1935.[219] For transmission, the 1992 Act also introduced competition by requiring utilities to make their lines available to competing generators. With respect to distribution of electricity directly to customers, the 1992 Act did not *require* states to allow wheeling of electricity directly from a generator to customers, thus bypassing a local utility.[220] However, the 1992 Act likewise did not prohibit states from permitting direct-sales competition.[221]

While IOUs and their trade organizations feared "the old electric industry would expire, to be replaced by a dynamic, new, competitive business,"[222] the prediction of IOU demise proved premature as those who created the policies to introduce more competition "underestimated the ability of the incumbents to manage the process to their advantage, of stakeholders to influence legislatures, of regulators to hold on, and of enterprising trading types and out-and-out crooks to outwit those in charge of the new markets."[223] By 1999, twenty-five states had come to, or were moving toward, restructuring their retail markets for competition.[224] However, that progress was slowed after the financial collapse of Enron. The number of states with retail choice is currently

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[218] In October 1983, Cincinnati G&E announced it could not complete the Zimmer nuclear power station, which was supposedly 97% complete, without over $3 billion more of investment over two to three years. HYMAN ET AL., *supra* note 7, at 180-81. In June 1983, the Washington Public Power Supply System had to cancel two of five planned nuclear power plants and halt construction of a third when its costs for the initial two tripled. *Id.* In January 1988, the Public Service of New Hampshire filed for bankruptcy. *Id.*

[219] Energy Policy Act of 1992, 41 U.S.C. § 13201; Public Utility Holding Company Act of 1935, 15 U.S.C. § 79, *repealed by* Energy Policy Act of 2005, Pub. L. 109-58, Title XII, § 1263, 119 Stat. 974; *see also* James W. Moeller, *Requiem for the Public Utility Holding Company Act of 1935: The "Old" Federalism and State Regulation of Inter-State Holding Companies*, 17 ENERGY L.J. 343 (1996); Nidhi Thakar, Comment, *The Urge to Merge: A Look at the Repeal of the Public Utility Holding Company Act of 1935*, 12 LEWIS & CLARK L. REV. 903 (2008).

[220] "Wheeling" means "[t]he movement of electricity from one system to another over transmission facilities of interconnecting systems." *Glossary*, U.S. ENERGY INFO. ADMIN., https://perma.cc/FXV3-R57N.

[221] 16 U.S.C. § 824(b)(1) ("[FERC] shall have jurisdiction over all facilities for such transmission or sale of electric energy, but shall not have jurisdiction . . . over facilities used for the generation of electric energy or over facilities used in local distribution or only the transmission of electric energy in intrastate commerce . . . .")

[222] HYMAN ET AL., *supra* note 7, at 199.

[223] *Id.*

[224] *Id.* at 205 (noting that thirteen states had retail access, and twelve states were pursuing).

at only sixteen, with no additional states actively pursuing such restructuring,[225] and participation by residential customers is below 20% in seven of the sixteen deregulated states.[226]

FERC has long been aware of biases against newer technologies and attempted to address them through a number of administrative initiatives to reduce monopoly practices that discouraged competition. Before federal intervention, IOUs "pancaked" multiple charges from various monopolies onto a generation source, such as a wind farm, when using their transmission lines to reach distant customers.[227] FERC introduced non-profit Independent System Operators (ISOs)[228] and then Regional Transmission Organizations (RTOs),[229] taking away utility ownership of transmission to "prevent unfair operation of the lines."[230] Eventually, FERC had to issue a third order, Order 2000, to put more pressure on utilities to "voluntarily place their transmission assets into RTOs . . . within a specified period of time, or explain why."[231] Despite these and other efforts, FERC concluded that "simply opening markets would not benefit consumers if a few producers dominated the market and used their market power to maintain high prices."[232]

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[225] As of 2021, in addition to the District of Columbia, there were sixteen deregulated states, including California, Connecticut, Delaware, Illinois, Massachusetts, Maryland, Maine, Michigan, Montana, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, and Texas. AM. PUB. POWER ASS'N, RETAIL ELECTRIC RATES IN DEREGULATED AND REGULATED STATES: 2021 UPDATE (May 2022), https://perma.cc/7247-XQ69; *see also US States with Deregulated Energy in 2022*, QUICK ELECTRICITY, https://perma.cc/M6G9-6BRG; *Deregulated Energy States*, ELECTRICITYRATES.COM, https://perma.cc/KA75-R4MA (Nov. 1, 2022).

[226] AM. PUB. POWER ASS'N, *supra* note 225.

[227] HYMAN ET AL., *supra* note 7, at 206 ("If the operator had to send the power 100 miles over the line of one utility, it would pay one charge, but if it had to use the lines of three utilities to travel the same distance, it would pay three times as much" in a practice FERC called "pancaking.")

[228] *Id.*

[229] FERC Orders 888 and 889 created ISOs in addition to RTOs. FERC Open Access Same-Time Information System (formerly Real-Time Information Networks) and Standards of Conduct Order No. 889, 18 C.F.R. 37 (1996), https://perma.cc/NU92-8PE6. While RTOs generally cover larger territories, FERC's orders created the RTOs and ISOs as entities to provide non-utility electricity generators access to IOU transmission lines. *See* KENNETH ROSE, NATIONAL REGULATORY RESEARCH INSTITUTE, OHIO ST. U., SUMMARY OF KEY STATE ISSUES OF FERC ORDERS 888 AND 889 NRRI 97-08, at 3-10 (1997).

[230] HYMAN ET AL., *supra* note 7, at 207.

[231] *Id.*

[232] *Id.* at 208.

More recently, FERC issued several orders supporting the integration of non-traditional technologies such as solar and storage.[233] In 2011, Order 745 mandated compensation for demand response resources that can connect and help balance loads.[234] Traditional IOUs challenged Order 745, but the Supreme Court upheld it. [235] FERC continued bolstering market competition with Order 784, which aimed to "enhance the ability of third parties to compete for the sale of certain ancillary services" to wholesale energy markets.[236] This order attempts to create more transparency among market participants by eliminating restrictions on third-party ancillary-service sales, introducing speed and accuracy as considerations for pricing, and revising accounting practices to better track the value of energy storage.[237]

Next, Order 819 targeted IOU resistance to electric storage by allowing the sale of "frequency response," a key service provided by batteries,[238] at market-based rates[239] Similarly, FERC's Order 841 encourages RTO/ISO use of storage by requiring them to establish tariffs "recognizing the physical and operational characteristics of electric storage resources . . . ." [240] IOUs challenged Order 841, but the D.C. Circuit upheld it.[241]

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[233] The Energy Policy Act of 2005 included a number of policy declarations to encourage and facilitate "the deployment of technology and devices that enable electricity customers to participate in [time-based] pricing and demand response systems . . . and [eliminate] unnecessary barriers to demand response participation in energy, capacity and ancillary service markets." Pub. L. No. 109-58, § 1252(f). These declarations were used to support FERC Order 745 and others. *See, e.g.*, Fed. Energy Regul. Comm'n v. Elec. Power Supply Ass'n, 577 U.S. 260, 271 (2016).

[234] Demand Response Compensation in Organized Wholesale Energy Markets, 134 FERC ¶ 61,187, Order No. 745 at 1 (Mar. 15, 2011).

[235] *Elec. Power Supply Ass'n*, 577 U.S.

[236] Third-Party Provision of Ancillary Services; Accounting and Financial Reporting for New Electric Storage Technologies, Order No. 784, 78 Fed. Reg. 46177, 46179 (July 18, 2013).

[237] *See, e.g.*, Stinson LLP, *Energy Insight: FERC Order 784—Accommodating The Battery; Supporting Electricity Storage* (Aug. 30, 2013), https://perma.cc/NU4Y-P6PC; *FERC Issues Order No. 784: Third-Party Provision of Ancillary Services; Accounting and Financial Reporting for New Electric Storage Technologies (RM11-24-000; AD10-13-000)*, WINSTON & STRAWN LLP (July 22, 2013), https://perma.cc/28TW-BDXD.

[238] Glenn McGrath, *Battery Storage Applications Have Shifted as More Batteries Are Added to the U.S. Grid*, U.S. ENERGY INFO. ADMIN. (Nov. 1, 2021), https://perma.cc/TET2-GWL9.

[239] *Third-Party Provision of Primary Frequency Response Service*, Order No. 819, 80 Fed. Reg. 73965 (Nov. 20, 2015).

[240] 1 STEVEN FERREY, L. OF INDEP. POWER § 5:40.50 (Mar. 2023 Update).

[241] Practical Law Finance, *FERC Issues Final Rule Allowing Distributed Energy Resources to Participate in RTO and ISO Markets*, PRACTICAL LAW (Oct. 1, 2020), https://perma.cc/2PX7-VSLU.

As recently as 2022, FERC targeted industry concerns that "FERC's current Uniform System of Accounts does not adequately account for renewable assets."[242] FERC emphasized creating new production accounting for wind, solar, and other non-hydro renewable generation assets as well as energy storage and hardware, software, and communication equipment.[243]

Order 2222 elucidates how entrenched systems stymie new technologies. In the past, IOUs siloed valuations by their functions as generation, transmission, and distribution. While older technologies could only perform one function, modern energy storage technologies created a new world—one where a single asset, a battery, could cross over between functions and both provide power when needed (generation) and take power when there is excess being generated (distribution).[244] To eliminate the bias against battery storage, FERC sought to consolidate generation, transmission, and distribution into one single accounting function for energy storage. This change allows batteries, and other new "grid-edge resources," the ability to receive revenues for all the services they provide.[245]

Nevertheless, FERC's regulatory authority is limited to interstate wholesale electricity. States wield power over retail sales to customers, leaving grid-edge technologies at the mercy of state regulators who are more susceptible to IOU lobbying. As a result, while "[o]ther parts of the world continue to move toward greater competition in electricity markets,"[246] IOUs have been able to maintain a controlling grip on the U.S. market and to delay innovation despite FERCs efforts. As one source concluded:

> Maxwell's Laws, after all, do not dictate that electricity must come from a vertically integrated, regulated natural monopoly. No reason remains to keep in place an early twentieth-century social concept

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[242] Mark R. Haskell et al., *Accounting for Change: Federal Energy Regulatory Commission Proposes Accounting and Financial Reporting Reforms to Address Renewable Energy Assets*, BLANK ROME LLP (Oct. 2022), https://perma.cc/9K6X-3NAH.

[243] *Id.*

[244] *See, e.g.*, EMANUELE TAIBI ET AL., ELECTRICITY STORAGE VALUATION FRAMEWORK: ASSESSING SYSTEM VALUE AND ENSURING PROJECT VIABILITY (Int'l Renewable Energy Agency 2020), https://perma.cc/MB3D-TGZM; *see also* SARA MULHAUSER, BATTERY ENERGY STORAGE TECHNOLOGY ADOPTION & ELECTRIC UTILITY STRUCTURE: ANALYZING FACTORS DRIVING STORAGE DEPLOYMENT ACROSS UTILITY OWNERSHIP STRUCTURES (Nat'l Ass'n of Regul. Util. Comm'rs 2020), https://perma.cc/6RY4-PH95.

[245] Brown, *supra* note 51, at 161.

[246] HYMAN ET AL., *supra* note 7, at 215.

> developed in the days when massive steam turbines represented cutting-edge technology . . . especially if the concept fosters inefficiency and technological stasis. Utilities have to emerge from their cosseted place in the world of regulation in order to succeed in the real world. They have to learn to compete, to run as businesses rather than government-protected monopolies. . . . Or they can attempt to manipulate the rules in a way that disadvantages the putative competitors. The old utilities know how to play the government relations and regulatory games. Should they use those strengths to maintain their advantages? Should one expect otherwise?[247]

III. THE POWER OF PUBLIC UTILITY DEFINITIONS

As the previous Part showed, federal legislators and agencies have limited ability to change the current U.S. electric utility structure. Consequently, it is up to the states to determine whether an entity falls within their definition of public utility.[248] This determination can have profound impacts on whether that entity is permitted to provide any electric services. In most states, public utilities are subject to regulation by the state PUC, and that regulation can be time-consuming, burdensome, and expensive, threatening the financial security, and ultimately the adoption of, newer technologies.[249] In addition, being designated a public utility can be a death knell in states that grant exclusive franchises to regulated IOUs because competition is prohibited in the monopoly franchise areas.[250]

Furthermore, defending the legal challenges by IOUs that view a new technology as a threat to their franchise presents an uneven playing field for deployment of new technologies. Grid-edge alternatives have to foot their own

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[247] *Id.* at 485.

[248] Although state terminology can vary (e.g., "electric utility"), this Article will use the terms "public utility" and "Public Utility Commission" (PUC) generically.

[249] KAREN ANDERSON, STATE STATUTORY DEFINITIONS OF ELECTRIC UTILITIES 1 (2019), https://perma.cc/LY8Y-CQD9; *see also* SolarCity Corp., Ariz. Corp. Comm'n No. E-20690A-09-0346 (July 12, 2010) [hereinafter *SolarCity Corp.*] ("The record in this case reflects the strong likelihood that regulation would diminish the ability of SolarCity to secure financing leading to increased transaction costs and greater expense for customers.").

[250] *See, e.g.*, State *ex rel.* Utils. Comm'n v. N.C. Waste Awareness & Reduction Network, 805 S.E.2d 712, 715 (N.C. Ct. App. 2017).

legal bills, while IOUs may charge their legal fees to IOU customers as a cost of doing business.

Thus, a broad, all-encompassing definition of public utility puts innovation at risk. Narrower definitions or specific exceptions can provide a more favorable environment for the development of newer technologies.[251]

No two states have identical language in their utility statutes, but there are some general trends. Some states that exert the furthest reach include in their definition of public utility any "individual" [252] or "person" [253] providing electricity, thereby not limiting regulation to larger corporations.[254] Most states require sale of the electricity to trigger utility status—some by mentioning compensation specifically and others by using the term "customer." [255] A

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[251] Brown, *supra* note 51, at 155-57; *see also* ANDERSON, *supra* note 249, at 3-4.

[252] ALASKA STAT. ANN. § 42.05.099(6) (West 2021); DEL. CODE ANN. tit. 26 § 202(g) (West 2021); 220 ILL. COMP. STAT. ANN. 5/3-105(a) (West 2021); IND. CODE ANN. § 8-1-2.3-2(b) (West 2021); KAN. STAT. ANN. § 66-104(a) (West 2021); MONT. CODE ANN. § 69-3-101(1) (West 2021); NEB. REV. STAT. ANN. § 25-21,275 (West 2021); N.J. STAT. ANN. § 48:2-13(a) (West 2021); OKLA. STAT. ANN. tit. 17 § 151 (West 2022); OR. REV. STAT. ANN. § 757.005(1)(a) (West 2021), 20 R.I. GEN. LAWS § 39-20-2(5) (West 2021); TENN. CODE ANN. § 65-4-101(6)(A) (West 2021), VT. STAT. ANN. tit. 30, § 201(1) (West 2021), VA. CODE ANN. § 56-232(A)(1) (West 2021); WIS. STAT. ANN. § 196.01(5)(a) (West 2021).

[253] ALA. CODE § 37-4-1(7) (West 2021), ARIZ. REV. STAT. ANN. § 40-201(8) (West 2021) Arkansas, ARK. CODE ANN. § 23-1-101(9)(B-D) (West 2021); CAL. PUB. UTIL. CODE § 216(a)(1) (West 2021); COLO. REV. STAT. ANN. § 40-1-103(1)(a)(I) (West 2021); D.C. CODE ANN. § 34-207 (West 2021); FLA. STAT. ANN. § 366.02(1) (West 2021); GA. CODE ANN. § 46-1-1(9); HAW. REV. STAT. ANN. § 269-1 (West 2021); IDAHO CODE ANN. § 61-129(1) (West 2021); IOWA CODE ANN. § 476.1(3) (West 2021); KY. REV. STAT. ANN. § 278.010(3) (West 2021); LA. STAT. ANN. § 45:121 (West 2021); ME. REV. STAT. ANN. tit. 35-A, § 102(20-B) (2021); MD. CODE ANN., PUB. UTIL. § 1-101(h)(1) (West 2021); MICH. COMP. LAWS ANN. § 460.501 (West 2021); MINN. STAT. ANN. § 216B.02(4) (West 2022); MISS. CODE. ANN. § 77-3-3(d) (West 2021); NEV. REV. STAT. ANN. § 704.020(2)(a) (West 2021); N.H. REV. STAT. ANN. § 362:2 (2021); N.M. STAT. ANN. § 62-3-3(G) (West 2021); N.Y. PUB. SERV. LAW § 2(23) (McKinney 2021); N.C. GEN. STAT. ANN. § 62-3(23)(a); OHIO REV. CODE ANN. § 4905.02(A) (West 2021); 66 PA. CONS. STAT. ANN. § 102(1)(i) (West 2021); S.C. CODE ANN. § 58-27-10(7); S.D. CODIFIED LAWS § 49-34A-1(12) (2021); TEX. UTIL. CODE ANN. § 31.002(6); UTAH CODE ANN. § 54-2-1(8)(a) (West 2021); WASH. REV. CODE ANN. § 80.01.040(3) (West 2021); W. VA. CODE ANN. § 24-1-2 (West 2021); WYO. STAT. ANN. § 37-1-101(a)(vi) (West 2021).

[254] *See generally* ANDERSON, *supra* note 249.

[255] For example, Alaska defines a "public utility" to include "every corporation, whether public, cooperative, or otherwise, company, individual, or association of individuals, their lessees, trustees, or receivers appointed by a court, that owns, operates, manages, or controls . . . any system for furnishing . . . electrical service to the public for compensation." ALASKA STAT. ANN. § 42.05.990(6) (West 2021); *see also* ARIZ. REV. STAT. ANN. § 40-201(8) (West 2021); ARK. CODE ANN. § 23-1-101(9)(B-D); CAL. PUB. UTIL. CODE § 216(a)(1) (West 2021); COLO. REV. STAT. ANN. § 40-1-103(1)(a)(I) (West 2021); DEL. CODE ANN. tit. 26 § 202(g); GA. CODE ANN. § 46-1-1(9) (West 2021); IDAHO CODE ANN. § 61-129 (West 2021) ; IOWA CODE ANN. § 476.1(3)

majority of states have created explicit exceptions for self-generation,[256] electricity provided by co-ops,[257] or by a landlord to tenants.[258] A handful of states have created explicit exceptions for newer technologies. Some of the most common exceptions include electric vehicle charging stations, co-generation, renewable energy facilities, small power producers, and property leased or energy sold to public utilities.

Also critical to the scope of PUC regulation is how courts have interpreted the term "public" in each state's statute. As discussed above, the concept of regulated monopolies is founded on protecting the public when a private entity provides an essential service and consumers have no other choices. At least nineteen states have judicial interpretations of the word "public" as it relates to a public utility.[259] These interpretations range broadly and have suggested that number of customers is not key; in some instances, an entity serving a single customer might still qualify as a public utility.[260] One such broad interpretation of public utility in Florida would have resulted in PUC regulation

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(West 2021); 220 ILL. COMP. STAT. ANN. 5/3-105(a) (West 2021); IND. CODE ANN. § 8-1-2.3-2(b) (West 2021); KY. REV. STAT. ANN. § 278.010(3) (West 2021); MINN. STAT. ANN. § 216B.024(4) (West 2021); MISS. CODE ANN. § 77-3-3(d) (West 2021); N.C. GEN. STAT. ANN. § 62-3(23)(a) (West 2021); 66 PA. CONS. STAT. ANN. § 102(1)(i) (West 2021); S.C. CODE ANN. § 58-27-10(7) (West 2021); TEX. UTIL. CODE ANN. § 31.002(6) (West 2021); WASH. REV. CODE ANN. § 80.01.040(3) (West 2021).

[256] ALA. CODE § 37-6-2 (West 2021); CAL. PUB. UTIL. CODE § 2777 (West 2021); HAW. REV. STAT. ANN. § 269-1 (West 2021); IDAHO CODE ANN. § 61-119 (West 2021); LA. STAT. ANN. § 45:1163(A)(3) (West 2021); ME. REV. STAT. ANN. tit. 35-A, § 102(20-B) (2021); MD. CODE ANN., PUB. UTIL. § 1-101(h)(2) (West 2021); MICH. COMP. LAWS ANN. § 460.10a(4) (West 2021); Mississippi, *infra* note 346; MO. ANN. STAT. § 386.020(15) (West 2021); MONT. CODE ANN. § 69-5-107 (West 2021); N.M. STAT. ANN. § 62-3-4(A) (West 2021); N.Y. PUB. SERV. LAW § 2(13) (McKinney 2021); N.C. GEN. STAT. ANN. § 62-3(23)(a)(1); OHIO REV. CODE ANN. § 4928.01(A)(32) (West 2021); Oklahoma, *infra* note 355; 66 PA. CONS. STAT. ANN. § 102 (West 2021); S.C. CODE ANN. § 58-27-10(7) (West 2021); TEX. UTIL. CODE ANN. § 31.002(6); UTAH CODE ANN. § 54-2-1(8)(b) (West 2021); VA. CODE ANN. § 56-265.1(b); WYO. STAT. ANN., § 37-1-101(a)(vi)(H).

[257] As of 2019, these states were Alabama, Arkansas, Arizona, California, Colorado, Connecticut, Delaware, Florida, Illinois, Iowa, Kansas, Kentucky, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Mexico, New York, North Carolina, North Dakota, Oklahoma, Oregon, South Carolina, South Dakota, Tennessee, Texas, Washington, West Virginia, Wisconsin, and Wyoming. ANDERSON, *supra* note 249, at 8-15.

[258] As of 2019, these states were Alabama, Alaska, Arkansas, California, District of Columbia Idaho, Maine, Maryland, Minnesota, Mississippi, Missouri, New Mexico, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Texas, Utah, and Wyoming. *Id.*

[259] As of 2019, these states were Alabama, Arizona, Delaware, Florida, Hawaii, Idaho, Illinois, Indiana, Iowa, Missouri, New Mexico, New York, North Carolina, Oklahoma, Pennsylvania, Tennessee, West Virginia, Wisconsin, and Wyoming. *Id.*

[260] *See, e.g.*, Unocal Cal. Pipeline Co. v. Conway, 28 Cal. Rptr. 2d 429, 431 (Cal. Ct. App. 1994).

of a renewable energy project[261] that would have provided power to a single customer.[262]

Perhaps the most widely used test for making a determination of whether an entity is "clothed with a public interest" sufficient to warrant regulation to protect a "public concern" comes from the 1950 Arizona Supreme Court case *Natural Gas Service Co. v. Serv-Yu Cooperative*.[263] *Serv-Yu* looks at eight factors to determine whether the entity should be subject to regulation because it is "indispensable to large segments of our population:"[264]

1. What the corporation actually does.
2. A dedication to public use.
3. Articles of incorporation, authorization, and purposes.
4. Dealing with the service of a commodity in which the public has been generally held to have an interest.
5. Monopolizing or intending to monopolize the territory with a public service commodity.
6. Acceptance of substantially all requests for service.
7. Service under contracts and reserves the right to discriminate is not

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[261] PW Ventures proposed a "integrated renewable energy production complex in Hendry County [Florida] that will produce ethanol, carbon dioxide, and potentially other products from renewable energy sources." Fla. Pub. Serv. Comm'n, In re: Petition for declaratory statement regarding co-ownership of electrical cogeneration facilities in Hendry County by Southeast Renewable Fuels, LLC, Order Denying Petition for Declaratory Statement. Order No. PSC-13-0652-DS-EQ at 6 (Dec. 11, 2013), https://perma.cc/VX3M-6Q3B.

[262] PW Ventures, Inc. v. Nichols, 533 So. 2d 281, 283-84 (Fla. 1988) (affirming PUC's denial of PW's request for declaratory judgment that it would not be subject to regulation).

[263] Nat. Gas Serv. Co. v. Serv-Yu Coop., 219 P.2d 324, 326-28 (Ariz. 1950). Several states have adopted one or more of Arizona's *Serv-Yu* factors, either directly or indirectly citing *Serv-Yu,* in determining whether an entity is "clothed with public interest" sufficiently to fit within their statutes' definition of a public utility. *Id.* at 326; *see, e.g.*, U.S. Steel Corp. v. N. Ind. Pub. Serv. Co., 482 N.E.2d 501, 505-06 (Ind. Ct. App. 1985) ("This classification of 'public callings' or businesses 'affected with a public interest,' comprises to a large extent what are known today as public utilities. They are in most cases regulated by the state. Upon the dedication of a business to a public use, it is established that such business is under a common law duty to serve all who apply so long as facilities are available, without discrimination."); Bridle Bit Ranch Co. v. Basin Elec. Power Co-op., 118 P.3d 996, 1009-11 (Wyo. 2005) (Iowa State Com. Comm'n v. N. Nat. Gas Co., 161 N.W.2d 111, 115 (Iowa 1968) using the language "sales to sufficient of the public to clothe the operation with a public interest" to ultimately find that the company condemning a right-of-way for a transmission line was not a public utility (quoting Iowa State Com. Comm'n v. N. Nat. Gas Co., 161 N.W.2d 111, 115 (Iowa 1968)), where *Iowa State Com. Comm'n* quotes the *Serv-Yu* factors); SZ Enters., LLC v. Iowa Utils. Bd., 850 N.W.2d 441, 445-48 (Iowa 2014) (discussed *infra*). *Serv-Yu* is also cited in 73B C.J.S. *Public Utilities* § 3 (2023) and 119 A.L.R. 1012 (1939).

[264] Petrolane-Ariz. Gas Serv. v. Ariz. Corp. Comm'n, 580 P.2d 718, 720 (Ariz. 1978).

always controlling.

8. Actual or potential competition with other corporations whose business is clothed with public interest.[265]

The entity need not meet all of these criteria, just enough on a case-by-case basis depending on the facts of each individual case. As an example, a 2006 Arizona case found that a nonprofit electric transmission cooperative met both the textual definition of a "public service corporation" in Arizona's constitution[266] and a majority of the *Serv-Yu* factors.[267] Consequently, the Court found it must be regulated by the Arizona Corporation Commission (the state PUC) because it was "clothed with a public interest" to the extent contemplated by law which subjects it to governmental control,[268] and its "business and activities . . . such as to make its rates, charges and methods of operation, a matter of public concern."[269]

In contrast, a 2014 Iowa case, *SZ Enterprises, LLC v. Iowa Utilities Board*, involved the construction of a solar energy system by a company called Eagle Point on property owned by the City of Dubuque, Iowa, with an agreement that the city would purchase all of the electricity generated.[270] The Iowa Supreme Court concluded that the "provision of electric power through a 'behind the meter' solar facility was not the type of activity which required a conclusion that Eagle Point was a public utility."[271] The court further found that, "in this case, the balance of factors point away from a finding that the third-party power purchase agreement (PPA) for a behind-the-meter solar generation facility is sufficiently 'clothed with the public interest' to trigger regulation."[272] Some factors that influenced the *SZ Enterprises* court's conclusion were the

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[265] *Serv-Yu*, 219 P.2d at 325-26.

[266] Sw. Transmission Coop. v. Ariz. Corp. Comm'n, 142 P.3d 1240, 1244 (Ariz. Ct. App. 2006) (noting that meeting the statutory definition is not enough (citing Sw. Gas Corp. v. Ariz. Corp. Comm'n, 818 P.2d 714, 721 (Ariz. Ct. App. 1991))).

[267] *Id.* at 1245-47.

[268] *Id.* at 1246 (quoting *Sw. Gas*, 818 P.2d at 721).

[269] Finally, the court also noted that the entity's "business must be of such a nature that competition might lead to abuse detrimental to the public interest." *Id.* at 1244-45.

[270] SZ Enters., LLC v. Iowa Utils. Bd., 850 N.W.2d 441, 443-44 (Iowa 2014).

[271] *Id.* at 444.

[272] *Id.* at 468; *see also id.* at 466 ("[W]e conclude that the proper test is to examine the facts of a particular transaction on a case-by-case basis to determine whether the transaction cries out for public regulation. We believe the *Serv-Yu* factors provide a reasoned approach when considering the question of whether the activity involved is sufficiently clothed with the public interest to justify regulation.").

first, fourth, and eighth *Serv-Yu* factors.[273] Referencing factor one, "what the company 'actually does,'" the Iowa Supreme Court noted that the district court had likened Eagle Point's contract with Dubuque to provide behind-the-meter solar generation to behind-the-meter energy efficiency measures such as insulation of one's home, which is not a business that provides electricity to all like an IOU.[274] The Iowa Supreme Court agreed that the first *Serv-Yu* factor favored Eagle Point because solar leasing was essentially a "method of financing" and "financing for solar activities should not draw an entity into the fly trap of public regulation."[275]

Next the district court looked to the fourth *Serv-Yu* factor, whether the activity is "dealing with the service of a commodity in which the public has been generally held to have an interest," concluding this test could have cut both ways.[276] Although the public might be interested in the essential service of electricity, the court also noted that "the electricity provided was not dependent upon any common facilities that served the public and was generated and consumed behind the meter on the customer's premises. A shutdown of Eagle Point facilities would be far less serious than the effects of a shutdown of services by electric utilities such as Interstate Power."[277] The Iowa Supreme Court agreed that behind-the-meter solar photovoltaics (PV) were simply an "option" and "not an essential commodity required by all members of the public."[278]

Finally, the eighth *Serv-Yu* factor, "[a]ctual or potential competition with other corporations whose business is clothed with public interest," the district court concluded that behind-the-meter solar provided some degree of competition, but noted that "Eagle Point was not trying to replace or sever the relationship between Interstate Power and the city."[279] The Iowa Supreme Court found this factor "most interesting" in that potentially Eagle Point might provide some competition.[280] However, the "countervailing positive impacts," and "balance of [*Serv-Yu*] factors point[ed the Iowa Supreme Court] away" from

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[273] *Id.* at 466-68. The Iowa Supreme Court also considered the second, fifth, sixth, and seventh criteria. *Id.*
[274] *Id.* at 447.
[275] *Id.* at 466-67.
[276] *Id.* at 448.
[277] *Id.*
[278] *Id.* at 467.
[279] *Id.* at 448.
[280] *Id.* at 467.

finding that Eagle Point should be regulated as a public utility.[281] Additional utility challenges to third-party solar will be discussed in Part IV below.

Several states apply just one or more of the factors without acknowledging *Serv-Yu*, which, if known by the court in that jurisdiction, would have persuasive rather than precedential authority. This includes states that seem to embrace tests similar to the first three *Serv-Yu* criteria: "1. What the corporation actually does. 2. A dedication to public use. 3. Articles of incorporation, authorization, and purposes."[282] Alternatively, courts in Hawai'i,[283] Idaho,[284] Missouri,[285] Pennsylvania,[286] Tennessee,[287] West Virginia,[288] and Wisconsin[289] have chosen an intends-public-use approach to determine whether an entity should be subject to PUC regulation. In these states, the number of customers is not dispositive as to whether the facility serves the public. Instead, the courts look to the intent of the facility and whether it holds itself out as devoted to use by the public.

Most of the jurisdictions above have reduced the scope of public utility regulation through a narrow judicial interpretation. In contrast, the following have interpreted their statutes broadly to include more entities within the definition of a "public utility." Using a test similar to the sixth *Serv-Yu*, "Acceptance of substantially all requests for service,"[290] has perhaps received the most criticism. For example, a 1988 Alabama case held that selling and distributing energy products alone does not make all purveyors of energy

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[281] *Id.* at 468. Some of these measures include helping to meet peak demand and furthering "one of the goals of regulated electric companies, namely, the use of energy efficient and renewable energy sources." *Id.*

[282] Nat. Gas Serv. Co. v. Serv-Yu Coop., 219 P.2d 324, 325 (Ariz. 1950).

[283] *In re* Wind Power Pac. Invs.-III, 686 P.2d 831, 834 (Haw. 1984) ("The test is, therefore, whether or not such person holds himself out, expressly or impliedly, as engaged in the business of supplying his product or service to the public, as a class, or to any limited portion of it, as contradistinguished from holding himself out as serving or ready to serve only particular individuals." (quoting 73B C.J.S. *Public Utilities* § 3)).

[284] Humbird Lumber Co. v. Pub. Utils. Comm'n., 228 P. 271, 273 (Idaho 1924).

[285] Hurricane Deck Holding Co. v. Pub. Serv. Comm'n, 289 S.W.3d 260, 264 (Mo. Ct. App. 2009) (citing State *ex rel.* M. O. Danciger & Co. v. Pub. Serv. Comm'n, 205 S.W. 36, 38 (Mo. 1918)).

[286] Bethlehem Steel Corp. v. Pub. Serv. Comm'n, 713 A.2d 1110, 1114-15 (Pa. 1998).

[287] Memphis Nat. Gas Co. v. McCanless, 194 S.W.2d 476, 479-80 (Tenn. 1946).

[288] Preston Cnty. Light & Power Co. v. Renick, 113 S.E.2d 378, 385 (W. Va. 1960).

[289] City of Sun Prairie v. Pub. Serv. Comm'n, 154 N.W.2d 360, 362 (Wis. 1967).

[290] Nat. Gas Serv. Co. v. Serv-Yu Coop., 219 P.2d 324, 325-26 (Ariz. 1950).

commodities "public utilities."[291] The Alabama Supreme Court quoted Black's Law Dictionary as stating that, "[t]o constitute a true 'public utility,' the devotion to public use must be of such character that the public generally, or that part of it which has been served and which has accepted the service, has the legal right to demand that the service shall be conducted . . . ."[292]

In contrast, Kansas seemed to apply a similar test, but with opposite results, in *Cities Service Gas Co. v. State Corporation Commission.*[293] The court here focused on the statutory language "except for private use" to define a public utility and then held that "there is nothing in the Kansas statutory definition of a public utility which requires it to hold itself out as serving the public generally."[294]

Likewise, in an unpublished decision, a district-level court in Delaware applied a public interest test to determine that a water service was a public utility.[295] Public utility status was triggered by "sale of a regulated commodity to independent third parties" even if the "company sells to less than the general public."[296] The test requires a two-part determination: (1) "whether there is a sale of a regulated commodity to independent third parties" and (2) "whether such sales affect the public interest in a significant manner."[297]

Similarly, the federal government has declared the transport and sale of natural gas a "public interest,"[298] and "[i]n accordance with this statutory declaration, a majority of states have chosen to reject the 'indiscriminate-

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[291] Coastal States Gas Transmission Co. v. Ala. Pub. Serv. Comm'n, 524 So. 2d 357, 359-60 (Ala. 1988); *see also* Generic Proceeding to Determine the Commission's Jurisdiction Over Electric Vehicle Charging Stations, Docket No. 32694 (Ala. P.S.C. June 22, 2018), 2018 WL 3208563, at *3 (finding Electric Vehicle Charging Stations are not public utilities apparently adopting the Attorney General's rationale that they "do not engage in supplying the public necessary services and do not service all inhabitants within the area they operate. Instead, EVCS provide a convenient service of charging electric vehicle batteries to a limited number of consumers who have chosen to invest in an electric vehicle.").

[292] *Coastal States*, 524 So. 2d at 361 (emphasis added) (quoting *Public Utility*, BLACK'S LAW DICTIONARY (5th ed. 1979)).

[293] Cities Serv. Gas Co. v. State Corp. Comm'n, 567 P.2d 1343, 1352 (Kan. 1977).

[294] *Id.*

[295] E. Shore Nat. Gas Co. v. Del. Pub. Serv. Comm'n, 637 A.2d 10, 17 (Del. 1994), *overruled in part on other grounds by* Pub. Water Supply Co. v. DiPasquale, 735 A.2d 378 (Del. 1999) (discussing *In re* Bayview Improvement Co., PSC Docket No. 288 (May 4, 1960)).

[296] *Id.*

[297] Rsrvs. Dev. Corp. v. State Pub. Serv. Comm'n., No. Civ.A. 02A-07-001 HD, 2003 WL 139777, at *3 (Del. Super. Ct. Jan. 17, 2003), *aff'd*, 830 A.2d 409 (Del. 2003).

[298] 15 U.S.C. § 717a (2005).

service-to-an-indefinite-public' test." [299] Instead, these states "choose to emphasize the public nature of a company's activities in relation to that public interest."[300] Delaware,[301] Iowa,[302] Ohio,[303] Minnesota,[304] and New Jersey[305] all seem to have reached a similar conclusion. One reason this criterion is suspect is because it can be manipulated by the party wishing to enter the market—avoiding PUC regulation "by simply stating it would not sell to certain customers."[306]

The final *Serv-Yu* factor, "[a]ctual or potential competition with other corporations whose business is clothed with public interest,"[307] can swing for or against a party attempting to enter a market depending upon how protectionist the PUC is of the existing utility[308] or its own authority.[309] It is ironic, but not surprising, that companies with as much financial and political clout as IOUs would be sure that statutes explicitly include language to protect their bottom lines from competition. Public utility commissions were "remedial in nature," intended to restrict "unchecked competition between the utilities and to provide a redress for wrongs inflicted upon persons dependent upon a utility's services."[310] Regulation was needed where "rates for and extent of their services could not be privately determined." [311] Commissions justify regulation if "destructive competition" would have "adverse consequences for

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[299] *E. Shore Nat. Gas Co.*, 637 A.2d at 18.

[300] *Id.*

[301] *Id.*

[302] Iowa State Com. Comm'n v. N. Nat. Gas Co., 161 N.W.2d 111, 116-17 (Iowa 1968).

[303] Indus. Gas Co. v. Pub. Utils. Comm'n, 21 N.E.2d 166, 168-69 (Ohio 1939).

[304] N. Nat. Gas Co. v. Minn. Pub. Serv. Comm'n, 292 N.W.2d 759, 763 (Minn. 1980).

[305] *In re* S. Jersey Gas Co., 561 A.2d 561, 568-69 (N.J. 1989).

[306] *E. Shore Nat. Gas Co.,* 637 A.2d at 18.

[307] SZ Enters., LLC v. Iowa Utils. Bd., 850 N.W.2d 441, 448 (Iowa 2014) (quoting Sw. Transmission Coop. v. Ariz. Corp. Comm'n, 142 P.3d 1240, 1244 (Ariz. Ct. App. 2006)).

[308] In some situations, PUC employees may have biases toward or improper ties with the IOUs, which can be called "regulatory capture." *See, e.g.*, Tony Kovaleski et al., *Former Top CPUC Director "Disgusted" by Behavior of Leadership*, NBC BAY AREA, (Apr. 5, 2016, 3:30 PM), https://perma.cc/HJR2-64F2.

[309] Even if PUCs do not favor the utilities they regulate, they have a self-interest in preserving their need and status as a regulatory body. *See, e.g.*, *Coastal States*, 524 So. 2d at 364-65 (disagreeing with utility commission's overreach of authority under the statute and rejecting the commission's finding that its regulation would be just a "sham" if it allowed entities "to take business away from public utilities regulated by the Commission.").

[310] *E. Shore Nat. Gas Co.,* 637 A.2d at 11-12.

[311] *Id.* at 17.

the existing utility and its customers."[312] A 1991 natural gas case in Arizona stated the concerns as follows:

> [T]he purposes of regulation are to preserve and promote those services which are indispensable to large segments of our population, and to prevent excessive and discriminatory rates and inferior service where the nature of the facilities used in providing the service and the disparity in the relative bargaining power of a utility ratepayer are such as to prevent the ratepayer from demanding a high level of service at a fair price without the assistance of governmental intervention on his behalf.[313]

However, in the context of solar generation, the Arizona Corporation Commission applied the eight *Serv-Yu* factors to determine whether a solar company designing, installing, maintaining, and financing solar panels for non-profit entities should be considered a public utility.[314] In concluding that the solar company did not need PUC regulation, the commission noted:

> It would run counter to the public interest to unnecessarily throw up hurdles to an important sector of the solar market being able to participate in meeting the very RES that this Commission created, and it would be an unfortunate result for schools, which appear ready and eager to implement solar energy systems for the benefit of taxpayers and students. The ratepayers, taxpayers and the public as a whole benefit when schools, governmental entities, and other non-profits are able to lower their operating costs by purchasing lower priced electricity through SSAs.[315]

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[312] *Id.* at 22-23. ("It is impossible for the Public Service Commission to monitor and effectively control the extent of competition in the provision of traditionally regulated commodities if an unregulated firm with no obligation to serve all similarly situated customers and without a general obligation to provide service to all who require it in a specific territory can essentially enter the public utility business and 'cherry pick' or 'cream skim' away the existing utility's highest volume customers. . . . The absence of such ability to regulate the extent of competition creates the potential for 'destructive competition' with resulting adverse consequences for the existing utility and its customers." (quoting In re E. Shore Nat. Gas Co., PSC Docket No. 92-2, Order No. 3372, at 22-23 (Feb. 11, 1992))).

[313] *Sw. Gas*, 818 P.2d at 721 (quoting Petrolane-Ariz. Gas Serv. v. Ariz. Corp. Comm'n, 580 P.2d 718, 720 (Ariz. 1978)).

[314] *SolarCity Corp.*, *supra* note 249, at 2.

[315] *Id.* at 48.

Significantly, the Arizona commission further noted that its oversight was not the exclusive remedy for any consumer concerns: "other avenues are available where the Registrar of Contractors oversees construction practices, the Attorney General addresses consumer fraud concerns and civil remedies remain available to SolarCity customers."[316] While the cases and tests in this Part have addressed the definition of public utility in a number of contexts, the following Part will focus on how these definitions played a significant role in the suppression of rooftop solar.

IV. SUPPRESSION OF ROOFTOP SOLAR

Deregulation has not significantly changed the regulated monopoly status of electricity suppliers for most residential customers. Similarly, other efforts to loosen IOU control of the distribution of electricity at the local level have met vehement utility and regulatory agency pushback against any infringement on the IOU exclusive service territory tradition.[317] This Part will address IOU pushback against rooftop solar as a case study.

One of the "primary driver[s] of rooftop solar expansion"[318] was third-party leasing of solar panels. Photovoltaic solar panels have decreased dramatically in price from $7.53/Watts of direct current (WDC) in 2010 to $2.71/WDC in 2020 for a residential twenty-two panel system.[319] Until recently, however, the high up-front costs to purchase and install a solar array proved to be a deterrent for many homeowners.[320] Companies such as SunRun[321] and Eagle Point[322] stepped in to fill the gap by providing third-party agreements. These companies

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316 *Id.*

317 Brown, *supra* note 51, at 182.

318 *Id.* at 176; *see also* Cameron Walker, *Power Purchase Agreements Expand Solar Development*, STATE & LOC. ENERGY REP. (Nov. 7, 2012), https://perma.cc/32FK-X5DE.

319 DAVID FELDMAN ET AL., NAT'L RENEWABLE ENERGY LAB'Y, U.S. SOLAR PHOTOVOLTAIC SYSTEM AND ENERGY STORAGE COST BENCHMARK: Q1 2020 (2021), https://perma.cc/LG84-QYMQ.

320 KATHARINE KOLLINS ET AL., SOLAR PV PROJECT FINANCING: REGULATORY AND LEGISLATIVE CHALLENGES FOR THIRD-PARTY PPA SYSTEM OWNERS, at v (2010), https://perma.cc/BN2C-83QC.

321 Justin J. Larson, *House of the Rising Sun:* SolarCity Corp. v. Arizona Department of Revenue *and the Taxation of Leased Solar Panels*, 59 JURIMETRICS 375, 375 (2019).

322 *See* EAGLE POINT SOLAR, https://perma.cc/DJ6N-CVFL.

install and maintain solar panels on a customer's property[323] and provide the electricity produced by the panels to the customer.[324]

Customers benefit with access to electricity that is not generated from a fossil-fuel source at prices below those of its regular public utility.[325] IOUs felt threatened because if more customers own and manage their own power, "less political and economic power remains for the utility." [326] Some IOUs weaponized their regulated monopoly status to prevent third-party providers from serving customers within their territories.[327] If a third-party provider is classified as a "public utility," this deters solar deployment because it adds time, cost, and regulatory uncertainty, including the possibility that third-party agreements would be prohibited entirely as an infringement on the territory granted exclusively to the IOU that holds the franchise for a particular location.[328]

Although attacks by IOUs against third-party solar arrangements came later, pushback against alternative innovative power generation dates back to the late 1980s.[329] The Florida Supreme Court sided with the state utility commission to find that providing alternative power to a single customer under a third-party arrangement fell within the meaning of the "public utility" definition because that entity was providing power "to the public."[330] Thus, any supplier that provided power to even one customer was a regulated utility.[331] The court's rationale hinged upon the traditional assumption that duplication or redundancy was wasteful.[332]

In a 2016 North Carolina case,[333] the non-profit North Carolina Waste Awareness and Reduction Network (NCWARN) sold PV-generated electricity to

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[323] The installation may also be on a business or other entity such as a school or church. This arrangement may be especially appealing to entities that do not pay taxes as the third party can then take the tax deduction.

[324] *See* KOLLINS ET AL., *supra* note 320, at 3.

[325] *Id.*

[326] SHALANDA H. BAKER, REVOLUTIONARY POWER: AN ACTIVIST'S GUIDE TO THE ENERGY TRANSITION 53 (2021).

[327] *See* KOLLINS ET AL., *supra* note 320, at 7.

[328] *Id.*

[329] *See* PW Ventures, Inc. v. Nichols, 533 So. 2d 281 (Fla. 1988).

[330] *Id.* at 284.

[331] Samuel Farkas, *Third-Party PPAs: Unleashing America's Solar Potential*, 28 J. LAND USE & ENV'T L. 91, 102 (2012).

[332] *PW Ventures*, 533 So. 2d at 283 (discussing concept of "uneconomic duplication"); *see also* discussion *infra* notes 171-78.

[333] *See also* brief discussion *supra* Section II.C.

a church through a PPA, raising the issue of whether the sale of electricity by NCWARN to the church "cause[d] it to be regarded as a 'public utility' pursuant to the Public Utilities Act . . . ."[334] The ruling cited section 62-3(23)(a)(1) of the North Carolina General Statutes, which explicitly stated self-generation of electricity was an exception to the definition of a public utility.[335]

However, the court concluded that the omission of an explicit financing exception within the statute indicated a legislative intent that financing through third-party compensation was *not* intended to fit within the self-generation exception.[336] Therefore, the court concluded NCWARN's PPA made it a public utility in direct competition with those IOUs holding franchises for the territory.[337]

Even though NCWARN was a non-profit providing services to a single church, the judge felt a need to provide protection for the monopoly utility and determined that the competition NCWARN represented "if [left unchecked,] . . . stands to upset the balance of the marketplace."[338]

Both of these lawsuits backfired. One year after the NCWARN ruling, the North Carolina legislature passed H.B. 589, which explicitly exempted third-parties providing electricity through a lease from the definition of public utility.[339] Also, in response to the ruling in *PW Ventures, Inc.*, Florida created a distinction between fixed-payment solar leases and variable-payment PPAs.[340] The key distinction appears to be the difference in payment structure under a lease versus a PPA; a solar electricity lease requires a fixed monthly payment from the consumer, effectively leasing the equipment to supply solar electricity.[341] In contrast, a PPA involves a sale because the third-party is selling the solar-generated electricity directly to the customer and charging a variable

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[334] State *ex rel.* Utils. Comm'n v. N.C. Waste Awareness & Reduction Network, 805 S.E.2d 712, 715 (N.C. Ct. App. 2017).

[335] *Id.* at 714.

[336] *Id.* at 715.

[337] *Id.* at 714.

[338] *Id.* at 715 ("North Carolina law precludes retail electric competition and establishes regional monopolies on the sale of electricity based on the premise that the provision of electricity to the public is imperative and that competition within the marketplace results in duplication of investment, economic waste, inefficient service, and high rates.").

[339] H.B. 589, 2017-2018 Gen. Assemb., Reg. Sess. (N.C. 2017) (enacted); N.C. GEN. STAT. § 62-126.3(5) (2017).

[340] *In re* Petition by Sunrun Inc. for declaratory statement concerning leasing of solar equipment, Declaratory Statement, Docket No. 20170273-EQ, Order No. 0251 (Fla. Pub. Serv. Comm'n, May 17, 2018).

[341] KOLLINS ET AL., *supra* note 320, at 17.

rate dependent upon the amount of electricity generated, thus "selling electricity," which is the function of the IOU.[342] Under this distinction, PPAs that did not use a fixed rate were prohibited as infringing on the territory granted exclusively to the IOU.[343]

Louisiana,[344] Kansas,[345] Mississippi,[346] Oklahoma,[347] and South Carolina[348] all follow the distinction that North Carolina and Florida have made that allows solar leases but bans third-party PPAs. Other states, like Kentucky, have detailed public utility definitions, rendering it difficult to support services such as third-party solar, either as PPAs or solar leases.[349]

A 2021 report, *Blocking Rooftop Solar*, lists examples of IOU pushback against solar in six states: Ohio, Florida, Illinois, Kansas, South Carolina, and California.[350] This report primarily lists lobbying efforts to change compensation paid to rooftop generators. The most recent victory of IOUs over rooftop solar is California's adoption of Net Energy Metering 3.0, which is projected to reduce demand for residential solar by 30% in 2023.[351]

Other states have had more favorable regulatory outcomes for rooftop solar. As discussed in Section III, the Iowa Supreme Court used the eight *Serv-Yu* factors to conclude in *SZ Enterprises* that Eagle Point's PPA providing rooftop solar electricity to the City of Dubuque did not require PUC regulation as a

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[342] *See, e.g.*, *In re*: Petition of Monsanto Company for a declaratory statement concerning the lease financing of a cogeneration facility (Monsanto), Docket No. 860725-EU, Order No.17009 (Fla. Pub. Serv. Comm'n Dec. 22, 1986). ("Monsanto's lessor would be supplying a means of producing electricity, not 'supplying electricity . . . to or for the public within this state' pursuant to FLA. STAT. ANN § 366.02(1).").

[343] KOLLINS ET AL., *supra* note 320, at 4.

[344] LA. STAT. ANN. § 45:121 (West 2021).

[345] KAN. STAT. ANN. § 66-1 (2022); Kan. Dept. of Revenue, Opinion Letter 0-2016-001 on Kansas Retailers' Sales Tax and Solar Power Purchase Agreements (Jan. 25, 2016).

[346] THIRD PARTY SOLAR PV POWER PURCHASE AGREEMENT (PPA), DSIRE INSIGHT (Aug. 2021), https://perma.cc/8GZH-8HKN ("Any entity selling electricity is subject to public utility regulations stipulated in MS code § 77-3-3, but MS net metering rules explicitly allow leasing of solar equipment.").

[347] *See* Okla. Op. Att'y Gen. 2018-5 (explaining that PPAs are prohibited in unincorporated sections of the state, but leases may be allowed depending on terms. A PPA disguised as a lease would be prohibited by the Act. Incorporated areas of the state allow both PPAs and leases, assuming a municipal franchise agreement is not required to install or maintain equipment in streets or public rights-of-way).

[348] THIRD PARTY SOLAR PV POWER PURCHASE AGREEMENT (PPA), *supra* note 346.

[349] KY. REV. STAT. ANN. § 278.010(3) (West 2021).

[350] LIPPEATT ET AL., *supra* note 151, at 2-3.

[351] Ryan Kennedy, *Retaining Value for Solar Customers Under California NEM 3.0 Rule Change*, PV MAG. (Feb. 20, 2023), https://perma.cc/M4LV-7GU5.

public utility.[352] Additional states have codified allowances; Colorado, Nevada, and Texas statutes provide that solar PPA providers are not "public utilities" if system size limitations are met.[353] Other states allow PPAs, but only for certain entities, such as public service corporations in Arizona[354] and tax-exempt organizations in Arkansas.[355]

Finally, at least three states have completely exempted third-party solar generators from their regulation of public utilities, allowing both PPAs and leases, through explicit statutes: Oregon,[356] Hawai'i,[357] and California.[358] However, California's statute also states that the power generated by a third-party provider must be "used solely on the property where it is generated."[359] This last restriction—limiting use to the property where solar power is generated—is an impediment to microgrids which require sharing among resources within the microgrid.

V. MOBILIZING MICROGRIDS

Microgrids are just now entering the battle that rooftop solar has been fighting for almost two decades. Across the country, little has changed to encourage an IOU to accept competition or to embrace infrastructure other than its own for the best cost-of-service returns. In fact, the last decades have taught IOUs to employ "mission creep," using the advantages they have from their monopoly status (such as a captive customer base) and impatience on the part of legislators about the slow progress of climate-friendly solutions (often caused by resistance of the IOU itself), to elbow in on previously competitive collateral markets such as rooftop solar installation or the build out of EV charging stations.[360]

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[352] SZ Enters., LLC v. Iowa Utils. Bd., 850 N.W.2d 441, 458 (Iowa 2014).
[353] *See, e.g.*, COLO. REV. STAT. § 40-2-124(1)(c)(II)(D) (2022); THIRD PARTY SOLAR PV POWER PURCHASE AGREEMENT (PPA), *supra* note 346 (illustrating restrictions in Nevada and Texas).
[354] *SolarCity Corp.*, *supra* note 249, at 5.
[355] ARK. CODE ANN. § 23-18-603(7)(C) (2019).
[356] OR. REV. STAT. § 757.005 (2003) ("Nothing in subsection (1)(b)(C) of this section shall prohibit third party financing of acquisition or development by a utility customer of energy resources to meet the heat, light or power requirements of that customer.").
[357] HAW. REV. STAT. § 269-1(2)(M)(i) (2022).
[358] Farkas, *supra* note 331, at 111-12 (citing CAL. PUB. UTIL. CODE § 2868(b) (2008)).
[359] KOLLINS ET AL., *supra* note 320, at 8.
[360] *See* Rule, *supra* note 169.

As the sections above illustrated, designation as a public utility can destroy a project. Under the public utility system, an existing IOU can prevent competitors from conducting business within its exclusive franchise territory. Even when alternative, grid-edge technologies are allowed within an IOU territory, the delay and added cost of connecting to the grid can threaten project viability.[361]

Complete avoidance of PUC regulation would be the best solution to allow the microgrid market to flourish. As noted above, technologies such as the iPhone and Tesla EVs would not be where they are today if every new feature had first to be approved through an arduous process before an agency that permits existing monopolies to challenge them for any potential negative impact to the competitors, including to competitors' bottom lines. Instead, these technologies have flourished in a free market that employed other customer protection mechanisms. As the Arizona Corporation Commission observed in the *SolarCity Corp.* case discussed in Section III, regulatory oversight is not the only solution. The federal government and states have agencies that protect consumers from threats to health, fraud, and other concerns.[362] In addition, if there is no protection agency, civil suits are a remedy.[363]

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[361] *See, e.g.*, Gwen Brown, *Interconnection Is Broken: Radical Rethinking Is Needed to Achieve Clean Energy Goals*, INTERSTATE RENEWABLE ENERGY COUNCIL (June 3, 2021), https://perma.cc/5ASM-2LBW; Elizabeth McGowan, *Utility's Interconnection Demands Stall Virginia Community Solar Project*, ENERGY NEWS NETWORK (Dec. 12, 2022), https://perma.cc/Q8CS-6A2N (reporting developer's prediction that Dominion Energy's demands will increase costs by about 50%); CLEAN COAL., VALENCIA GARDENS ENERGY STORAGE (VGES) PROJECT (DRAFT FINAL): TASK 8.3: FRONT-OF-METER (FOM) ENERGY STORAGE INTERCONNECTION CASE STUDY 15-16 (2021), https://perma.cc/U4M4-YKBE (noting that Valencia Gardens Energy Storage Project stalled when the actual time and cost for the project exceeded four times the original estimates).

[362] In February 2023, the U.S. National Highway Traffic Safety Administration issued new standards that required the recall of nearly 1.1 million vehicles sold by Tesla, Nissan, Ram and others. *See* Jordan Mendoza, *Over 1 Million Nissan, Tesla, and Ram Vehicles Recalled: Check Latest Car Recalls Here*, USA TODAY (Feb. 20, 2023, 7:06 AM ET), https://perma.cc/J4SU-GVW6. Studies by the U.S. National Toxicology Program found "clear evidence" that exposure to cell phone radiation caused heart and brain tumors in male rats. *First time Ever, a Smartphone Is Recalled Because of Excessive Levels of Hazardous RF Radiation*, RF SAFE, https://perma.cc/JU2A-Z3YM. The U.S. Federal Communications Commission limits cell phone radiation to 1.6 W/kg. *Id.*

[363] *See, e.g.*, CTIA - The Wireless Ass'n v. City of Berkeley, 928 F.3d 832 (9th Cir. 2019) (holding that City of Berkeley's ordinance requiring cell phone retailers to inform prospective cell phone purchasers that carrying a cell phone in certain ways may cause them to exceed Federal Communications Commission guidelines for exposure to radio-frequency radiation survived request for a preliminary injunction).

However, no state currently has free market entry for microgrids, and there was substantial pushback against even Sunnova's unobtrusive proposal, which sought CPUC regulation as a microgrid utility in markets that did not overlap with an existing IOU franchise.[364]

This Section will first describe the mechanisms used in the four states and territories that have attempted to develop actual microgrid deployment strategies in their public utility statutes.[365] California, Hawai'i, and Puerto Rico seek to provide standardized guidelines and cost tariffs so that microgrid proposals can avoid project-by-project uncertainties, while Maine appears to be promoting microgrids, but its process does not seem to streamline the case-by-case PUC process.

Finally, this Section addresses opportunities specifically open to community microgrids. While it is encouraging that policymakers appreciate the role community microgrids can play for energy justice, the measures provided will have limited impact if the more fundamental problem addressed in this article is not resolved—how to overcome the forces that cling to a traditional model that thwarts most microgrid deployment.

A. Microgrid Deployment: Four Stories

Three states and territories that had already experienced climate disasters learned the hard way to appreciate the value of resiliency. The year 2018 was the deadliest and most destructive season for wildfires in California until 2020 and 2021 surpassed that year's record.[366] Partially as a result, California passed S.B. 1399 in 2018. This act mandated "action to help transition the microgrid from its current status as a promising emerging technology solution to a

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[364] Elisa Wood, *Microutility Plan Down but Not Out in California*, MICROGRID KNOWLEDGE (Feb. 17, 2023), https://perma.cc/Y3L6-76LX ("Microgrid developers typically shy away from becoming utilities because of the Byzantine regulations utilities face. But that's beginning to change. In Ohio, a county formed its own utility to more easily pursue microgrid development within its borders. And in Washington, D.C., a microgrid developer has decided to pursue utility status under a state plan to create 'lightened regulation' for those who do.").

[365] While eighteen states have some mention of microgrids in their statutes, most are "roadmap" studies that have not risen to the level of actual deployment mechanisms. *See* Lenhart & Araújo, *supra* note 45, at 10-11 app. A.

[366] *Statistics*, NAT'L INTERAGENCY FIRE CTR., https://perma.cc/X757-ZDVQ.

successful, cost-effective, safe, and reliable commercial product . . . ." [367] S.B. 1399 tasked the CPUC with developing standards that, among other things, would "reduce barriers for microgrid deployment" [368] and "streamline the interconnection process and lower interconnection costs for direct current microgrid applications."[369]

Also in 2018, Hawaiians were forced to prepare for two category four hurricanes. First, Hurricane Hector barely missed the islands and caused minor damage. Then just two weeks later, Hurricane Lane flooded the island with the second highest rainfall total for a tropical cyclone since 1950.[370] That same year, Hawai'i passed H.B. 2110, described as "an act relating to resiliency."[371] In 2014, Hawai'i's PUC had rejected the IOU's resource plan and "chastis[ed] the utility for its self-serving efforts to slow-walk the state's renewable energy transition."[372]

Hurricane Maria hit Puerto Rico in 2017,[373] and it took "roughly 11 months for the island to restore power to all of the customers . . . ."[374] This was "the longest blackout in U.S. history."[375] In 2019, Puerto Rico enacted the Puerto Rico Energy Public Policy Act.[376] This act passed a little over a month after Puerto Rico's main utility submitted a proposal to divide the island into "eight connected regional 'mini-grids'" that would be "further broken down into smaller microgrids."[377] Both the mini-grids and the community-level microgrids could function independently in a disaster.

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[367] S.B. 1339, 2017-2018 Leg., Reg. Sess. § 1(e) (Cal. 2018) (enacted) ("The Public Utilities Commission, Independent System Operator, and State Energy Resources Conservation and Development Commission must take action to help transition the microgrid from its current status as a promising emerging technology solution to a successful, cost-effective, safe, and reliable commercial product that helps California meet its future energy goals and provides end-use electricity customers new ways to manage their individual energy needs.").

[368] CAL. PUB. UTIL. CODE § 8371(b) (West 2021).

[369] CAL. PUB. UTIL. CODE § 8371(f) (West 2021)

[370] Susannah Cullinane, *Hurricane Lane Dumped 52 Inches of Rain on Hawaii and There Might Be More on the Way*, CNN (Aug. 28, 2018, 6:25 AM EDT), https://perma.cc/5WN3-H6SP.

[371] H. B. 2110, 29th Legis. § 1 (2018).

[372] BAKER, *supra* note 326, at 43.

[373] *Puerto Rico Hurricane Maria*, FED. EMERGENCY MGMT. AGENCY, https://perma.cc/B2PU-VZ3G (Dec. 20, 2022).

[374] Max Zahn, *Puerto Rico's Power Grid Is Struggling 5 Years After Hurricane Maria. Here's Why.*, ABC NEWS (Sept. 22, 2022, 8:55 AM), https://perma.cc/ZA8K-4DWP.

[375] *Id.*

[376] S.B. 1121, 18th Assembly, 5th Sess. (P.R. 2019) (enacted).

[377] James Ellsmoor, *Puerto Rico's Utility PREPA Plans to Divide Island into Renewable Energy Microgrids*, FORBES (Feb. 12, 2019, 7:15 AM EST), https://perma.cc/7WBR-XUPF.

All three of these entities took similar approaches—charging their PUCs to minimize regulation and avoid the need for rate setting hearings by creating tariffs, or fixed prices, to standardize compensation for services microgrids can provide.[378] Unfortunately, almost five years later, neither the Hawai'i act nor Puerto Rico's has produced any usable results.

California legislators recognized that time was of the essence. Delay creates uncertainty that can jeopardize project financing, thus killing a project.[379] Delay is also a problem due to the urgency of addressing emission and reliability issues caused by climate emergencies. S.B. 1399 gave the CPUC a deadline for creating the standards and achieving the legislative goal of speeding up microgrid deployment: December 1, 2020.[380] Publicly owned electric utilities were only given six months.[381]

Sadly, the cumbersome regulatory process was not able to meet the time goals in the legislation. Although some progress has been made,[382] the CPUC is still mired in its tariff rulemaking and review process years past the deadlines.[383] One commentator places blame squarely with the regulators:

> The commission is saying that there need to be rules put in place for this kind of microgrid [Sunnova], but they are the ones who refuse to create those rules. They say that there should be more information,

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[378] SHEA, *supra* note 42 ("These legal agreements establish the services that microgrids can provide to the utility and the prices that microgrid operators will receive for those services. They are also designed to support strategic policy or system-level goals, such as enhanced reliability and resilience. In practical terms, tariffs attempt to provide microgrid owners and operators with fair and predictable compensation for electricity, electric services and other benefits that a microgrid provides to the electric utility. These policies have also directed state agencies to streamline and standardize the processes and requirements for microgrids to interconnect with the larger gr*id.*").

[379] Brown, *supra* note 51, at 157.

[380] S.B. 1339, 2017-2018 Leg., Reg. Sess. § 8371 (Cal. 2018) (enacted) ("The commission, in consultation with the Energy Commission and the Independent System Operator, *shall take all of the following actions by December 1, 2020*, to facilitate the commercialization of microgrids for distribution customers of large electrical corporations . . . ." (emphasis added)).

[381] S.B. 1339, 2017-2018 Leg., Reg. Sess. § 8372(a) (Cal. 2018) (enacted) ("Within 180 days of the first request from a customer or developer to establish a microgrid, the governing board of a local publicly owned electric *utility shall develop and make available a standardized process for the interconnection* of a customer-supported microgrid, including separate electrical rates and tariffs, as necessary." (emphasis added)).

[382] In early 2021, the CPUC approved tariffs for microgrids that are binding on the state's three large IOUs. *Resiliency and Microgrids*, PUB. UTILS. COMM'N, https://perma.cc/8F72-T7X5.

[383] *Id.*

> but they refuse to create a forum to present that same information, . . . The tragedy is that the citizens are the ones who suffer and are increasingly vulnerable to an unstable and dangerously aging electric grid. This is not a story about utility monopoly. It's a story about a state agency that refuses to comply with a law created five years ago to drive the commercialization of microgrids.[384]

Despite the delays, the California approach appears promising in that, once rulemaking is finally complete, microgrid participants should have clear guidelines about costs as well as what is required for interconnection. Furthermore, the rules may force utilities to provide faster interconnections and entry into their markets.[385]

2020 was another record year; the United States experienced the most billion-dollar disasters since 1980. Consequently, at least one more state took legislative action to promote microgrids.[386] In 2021, Maine passed legislation specifically attempting to take steps to integrate small-scale microgrids into the existing macrogrid. The Maine approach is to exempt these small microgrids from the statutory definition of public utility.[387] This exemption should allow microgrids to avoid the expensive and time-consuming uncertainty of PUC regulation for approval of projects and rates. Although Maine's 2021 statute appears well intended, Maine's approach of requiring case-by-case approval of each project, without imposing any timelines, may be too time consuming for individual projects. In addition, the approval process set out in the Maine statute contains a long checklist of vague criteria, all of which must be met for

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[384] Wood, *supra* note 364.

[385] Some of the most promising areas for market entry may already be identified. The CPUC requires regulated distribution companies to provide system maps showing where distributed local generation or storage could relieve congestion or improve reliability. *See* Herman K. Trabish, *How California's Utilities Are Mapping Their Grids for Distributed Resources*, UTIL. DIVE (Feb. 27, 2017), https://perma.cc/49CE-ASC4. New York state is also investigating similar options. *See* Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision, Order Adopting a Ratemaking and Utility Revenue Model Policy Framework, Matter No. 14-M-0101, Docket No. 1373 (N.Y. Publ. Serv. Comm'n May 19, 2016). Once such zones are identified, states should open these zones up for full-on competition and innovation without any traditional franchise limitations.

[386] ANDERSEN ET AL., *supra* note 96, at 6.

[387] ME. REV. STAT. tit. 35-A, § 3351(2) (2021) ("A person that constructs, maintains or operates a new microgrid . . . does not . . . become a public utility").

approval, and that may prove cumbersome at best, and at worst, impossible to satisfy.[388]

B. New Focus on Community Microgrids

Corporations and the military have long recognized the value of resilience. New technologies, such as solar PV and battery storage, give those with the financial resources the choice of determining what resilience is worth to them and the option to purchase back-up power systems.[389] Those suffering energy insecurity do not have these options.[390] They have been forced to rely on monopoly IOUs and a system that often places those IOU profits ahead of the best interests of their community.[391] As rates go up, reliability has gone down, which is especially frustrating as the IOUs block innovations, such as microgrids, which could address these problems because they threaten the entrenched IOU business model. Given the benefits and fairness of providing these resources to those most in need, legislators should make changing the system to embrace microgrids in general and community microgrids in particular.[392]

A handful of states have legislation promoting grid-connected community grants and pilot programs. For example, in 2022, Colorado passed H.B. 22-1013, which provided grants to co-ops and municipally owned utilities to invest in

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[388] ME. REV. STAT. tit. 35-A, § 3351 (3)(A)(5)-(3)(A)(8) (2021) (Some conditions include: "The person proposing the new microgrid demonstrates that the person has secured the financial capacity to operate the proposed new microgrid; (6) The person proposing the new microgrid demonstrates that the person has secured the technical capability to operate the proposed new microgrid; . . . and (8) The proposed new microgrid will not negatively affect the reliability and security of the electric gr*id.*"); *see also* L.D. 1053, 129th Leg., Reg. Sess. (Me. 2021) (enacted) (amending the state's rights-of-way law to make it easier for microgrids to have access.)

[389] *See, e.g.*, Sophie Alexande, *Rich Californians Shelling Out $30,000 to Ease PG&E Blackout Pain*, THE MERCURY NEWS, https://perma.cc/RQ6W-GRVE (Dec. 2, 2019, 6:25 AM).

[390] *See, e.g.*, Jackie Botts*, "We Need the Food That We Lost." Low-Income Families Still Reeling from Blackouts*, CAL MATTERS, https://perma.cc/E8S7-8KWJ (Feb. 27, 2020).

[391] BAKER, *supra* note 326, at 52-54.

[392] Some commentators have identified hurdles to community microgrids including: (1) limited availability of capital, (2) regulatory uncertainty, (3) microgrid falling with the definition of a public utility, and thus subject to PUC regulation and possibly its rate structures, (4) uncertain utility support, and (5) perceived high technical risk. *See* STEVE HOFFMAN & CHARLES CARMICHAEL, HOFFMAN POWER CONSULTING, SIX BARRIERS TO COMMUNITY MICROGRIDS . . . AND POTENTIAL WAYS DEVELOPERS CAN SURMOUNT THEM (Sept. 30, 2020), https://perma.cc/DL3T-6NT7.

microgrids.[393] Unlike IOUs, co-ops and government utilities are not afraid of competition and thus, are not motivated to preserve the status quo to enhance profits for shareholders.[394] As a result, most progress on deploying community microgrids has come in areas served by these entities instead of IOUs.[395]

Consequently, providing funding to these co-ops and government utilities for community microgrids should be the low hanging fruit for legislators. Areas that receive electric service from these entities do not threaten IOU's monopoly territories.[396] The IOU's primary reason for resistance to such programs is fear they will demonstrate the benefits of microgrids and other new technologies.[397] The Colorado statute recognized the outsized role that microgrids could play to provide energy justice by focusing on "communities . . . that are at significant risk of severe weather or natural disaster events."[398] As might be expected where the IOU is one of the largest lobbying forces in the state, the legislation was restricted to "eligible rural communities" in co-op or municipally owned utility territories to avoid funding any IOU competition.[399]

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[393] H.B. 22-1013, 2022 Leg., Reg. Sess. (Colo. 2022) (enacted). The Grid Resilience Grant Program provides $2.5 billion in formula grants to states and tribes to fund improvements to electric grids through the purchase of microgrids. DRAFT PROGRAM NARRATIVE OF BIPARTISAN INFRASTRUCTURE LAW - SECTION 40101(D) (State of Colo. 2023), https://perma.cc/GT5G-34K8. Colorado is estimated to receive approximately $8.6 million annually, or approximately $43 million, over the next five years from the Department of Energy's formula program used to disperse funds from the Infrastructure Investment and Jobs Act; this funding will be used to facilitate microgrid projects and other energy-related projects. *Id.*

[394] *See, e.g.*, Lenhart & Araújo, *supra* note 45, at 4.

[395] Although IOU involvement in microgrid projects quadrupled between 2014 and 2018, IOU projects still accounted for fewer than half (42%) of active microgrid projects in 2018 despite IOUs being the primary suppliers of electricity to U.S. customers. *Id.*

[396] Because the monopoly territory of an IOU is established and would not overlap with an existing muni or coop, there is no threat in those areas. However, IOUs are concerned about some of their customers switching to a muni model. *See, e.g.*, Herman K. Trabish, *California IOU Rates Found to Be Twice the Cost of Muni Power*, UTIL. DIVE (June 17, 2015), https://perma.cc/CM2Z-Z3UV; Allen Best, *As Costs Rack Up in Boulder's Push to Split with Xcel, Voters to Have the Final Say*, ENERGY NEWS NETWORK (Oct. 27, 2020), https://perma.cc/7XB5-MJUL.

[397] Best, *supra* note 396.

[398] H.B. 22-1013, 2022 Leg., Reg. Sess. (Colo. 2022) (enacted).

[399] *Id.* Congress is considering similar bills promoting microgrids for vulnerable communities or infrastructure. *See, e.g.*, MICROGRID Act, H.R. 2482, 117th Cong. (2021); Energy Resilient Communities Act, H.R. 448, 117th Cong. (2021); Airport Energy Resiliency and Renewable Energy Act, H.R. 9434, 117th Cong. (2021).

While some states have enacted limited legislation addressing microgrids or funding microgrid pilot projects,[400] the next step moving forward is to facilitate community microgrids in IOU territories. This legislation or regulation should include exceptions to the state public utility definition or create mandates for IOUs to facilitate, rather than obstruct, microgrid development and to speed up and guarantee interconnection of these microgrids with the macrogrid. Even within its discussion of how its Community Microgrid Enablement Program will help promote microgrids, PG&E warns, "The interconnection process is handled separately and independently from the microgrid development process, and can take significant time."[401]

California appears to be in the lead with its upcoming Microgrid Incentive Program.[402] But the CPUC still faces criticism for the delays in implementing it and for refusing to provide upfront grants to benefit the most disadvantaged communities.[403]

Furthermore, legislation to promote microgrids should increase across the country because the Infrastructure Investment and Jobs Act is providing funding for electric resilience projects.[404] The Inflation Reduction Act provides tax credits of up to 30% for microgrid controllers and other components of a

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[400] *See, e.g.*, H.B. 1249, 2022 Leg., Reg. Sess. (Colo. 2022) (enacted) (charging the Colorado Energy Office to create a "Microgrid Roadmap"); H.B. 227, 32d Leg., Reg. Sess. (Alaska 2022) (enacted) (relating to municipal energy and resilience improvement assessment programs and amending section 29.10.200 of the Alaska Statutes); ANDERSEN ET AL., *supra* note 96 (noting that in 2020, Illinois, New York, and Pennsylvania funded the creation of specific microgrid projects; Minnesota and New Hampshire held studies to evaluate microgrid potential; and Maine and Michigan considered legislation that would allow non-utilities to develop microgrids, with Maine passing its law in 2021). While Colorado's "Microgrid Roadmap" report will provide valuable information, the legislation does not mandate any implementation, and the process of deploying any microgrids as a result will probably take years. H.B. 1249. The deadline for the roadmap is July 1, 2024, but there is no penalty for not meeting that date. *Id.*; COLO. REV. STAT. § 24-38.5-113.

[401] *Community Microgrid Enablement Program (CMEP)*, *supra* note 79.

[402] *See* discussion *supra* Section I.B.

[403] Stephanie Doyle & Shina Robinson, *California PUC's Delay of Microgrids Program Harms Disadvantaged Communities*, UTIL. DIVE (Jan. 18, 2023), https://perma.cc/W3YC-ZRQX ("The commission has dragged out the timeline and gone along with the IOUs' plans, despite environmental justice advocates repeatedly submitting program design recommendations that center on equity and justice to the commission.").

[404] Infrastructure Investment and Jobs Act, Pub. L. No. 117-58, § 40103, 135 Stat. 429, 928-29 (2021).

microgrid system.[405] In addition to tax credits, the IRA is providing financial incentives of $415 billion into the clean energy economy over the next decade. This legislation recognizes the urgency of climate change, and some of the federal benefits will expire as soon as 2024.[406] Consequently, delay is costly both in terms of financing and in providing now the relief that energy insecure communities could glean from community microgrids.

CONCLUSION

Vulnerable communities are hardest hit when climate induced fires, floods, and storms—as well as cyber and physical threats—challenge the conventional grid. Community microgrids can combine new technologies to provide local, self-sufficient access to power in these communities during grid outages.

This Article provides a history of how the state-regulated for-profit monopoly utility structure came to dominate the U.S. electricity industry, and how, despite federal efforts to introduce more competition, this structure thwarts mobilization of microgrids and other innovative technologies. Utilities see these technologies as competition, and most public utility commissions do not incentivize utilities to embrace them under the predominate cost of service rate structure. A free-market system might be the best way to foster innovations for microgrids and other grid-edge technologies such as solar and storage, but resistance does not come from IOUs alone. Legislators and regulators also perpetuate a more stifling regulatory environment sometimes out of bias and sometimes simply to justify their existence as regulators.

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[405] *See, e.g.*, Lee, *supra* note 26 ("Microgrid controller tax credits start with a base credit of 6% and increase to 30% when apprenticeship and prevailing wage requirements are met, with room for additional bonus credits [if they meet] siting conditions or domestic content targets.").

[406] To receive the 30% credit, a microgrid controller must be constructed before Jan. 1, 2025. Inflation Reduction Act of 2022, Pub. L. No. 117-169, § 13102, 136 Stat. 1818, 1913-21 (2022). Note also that the Infrastructure Investment and Jobs Act mentions "microgrids" five times in the contexts of (1) providing grants; (2) federal funding for research; (3) defining an "eligible project"; and (4) & (5) funding for the Federal Highway Administration Highway Infrastructure Program. Infrastructure Investment and Jobs Act, Pub. L. No. 117-58, §40101(1)(H)(i), 135 Stat. 429, 926 (2021) (within § 40101 on "Preventing Outages and Enhancing the Resilience of the Electric Grid"); *id.* § 40103(c)(3)(E), 135 Stat. at 929 (within § 40103 on "Electric Grid Reliability and Resiliance Research, Development, and Demonstration"); *id.* § 40106, 135 Stat. at 935 (defining "eligible project" as one "to connect an isolated microgrid to an existing transmission, transportation, or telecommunications infrastructure corridor" within § 40106 on "Transmission Facilitation Program"); *id.* at tit. VIII, 135 Stat. at 1425-26.

Because U.S. utility regulation at distribution, or grid-edge, is primarily controlled by states, state statutory definitions of what entities qualify as "public utilities" subject to regulation are critical. The author conducted a comprehensive review of state statutory definitions and categorized them, explaining some of the tests employed through illustrative cases. Next, the article explores how these statutory public utility definitions slowed the deployment of rooftop solar electricity generation in some states by prohibiting or regulating contracts with third-party solar providers. In states that were more supportive of promoting roof-top solar, the most effective solution was to allow free-market competition by explicitly excluding at least smaller arrays from the statutory definition of a public utility, and thus exempting them from regulation.

Finally, this Article examined statutes in all fifty states to determine which ones might explicitly exempt microgrids from public utility status or otherwise promote them. Although several states and territories are beginning to research or create microgrid roadmaps, only four have taken more concrete steps toward microgrid deployment. California, Hawai'i, and Puerto Rico have statutes that would minimize regulation and avoid the need for rate-setting by creating standardized pricing through tariffs. Only CPUC has made much progress on setting these tariffs, and yet even this agency is moving too slowly, years behind the statutory deadline. The fourth state to have a specific microgrid statute is Maine, but its case-by-case approach for approvals does not improve on what appears to be a cumbersome time-consuming process.

The good news is that federal financial assistance from the Inflation Reduction Act and other sources is pouring into the states to promote microgrids and related innovative climate-friendly technologies. Up to 40% of these funds are targeted to vulnerable communities through the Justice40 Initiative. In addition, states are also providing funding, such as California's Microgrid Incentive Program. Consequently, it is a promising time for the deployment of community microgrids. As this Article illustrates, however, unless the underlying regulatory incentives are corrected, these vital microgrids will be delayed, if not stymied completely, and their benefits both to the communities seeking them and to the planet may be lost.