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Unservice: Reconceptualizing the Utility Duty to Serve in Light of Climate Change

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UNSERVICE: RECONCEPTUALIZING THE UTILITY DUTY TO SERVE IN LIGHT OF CLIMATE CHANGE

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"*No task more profoundly tests the capacity of our government, both in nation and state, than its share in securing for society those essential services which are furnished by public utilities*."

—*Justice Felix Frankfurter* [1]

INTRODUCTION

Many facets of utility monopoly regulation are approaching a minimum of eight decades as part of our legal landscape. A bedrock principle of state utility regulation is the duty to serve, which demands that utilities provide nondiscriminatory service to all those within their geographic territory for the specific service for which they have been granted a monopoly.[2] Within its exclusive territory, a utility is required "to serve all present and reasonably to be anticipated future users."[3] Each state has adopted some form of this for its regulated monopolies, although formulations differ. This

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1. FELIX FRANKFURTER, THE PUBLIC AND ITS GOVERNMENT 81 (2d prtg. 1931).

2. *See* Duncan Campbell, *Franchise Rights*, DER TASK FORCE, at 1:05:30 (May 4, 2020), https://www.dertaskforce.com/podcast/1 [https://perma.cc/PMW5-HE57]. Franchise rights give the right to be a monopoly in a specific territory. For electric utilities, for example, this also gives the right over grid infrastructure in that territory—which translates into private entities being unable to string lines between themselves if it would cross a public right of way. *Id.* at 04:48.

3. Daniel Wm. Fessler & Cynthia McArthur Morelli, *Franchise Modification and Constitutional Confrontation: An Avoidable Crisis of Consumer Expectations and Investor Trust*, 44 S.D. L. REV. 552, 558 (1999).

Article argues that in light of climate change impacts, the duty to serve must change.

This would require a sea change in utility regulation. Historically, the duty to serve has been successful at providing essential services to a significantly high portion of the population at reasonable cost.[4] Since the seminal utility monopoly cases,[5] regulatory changes in traditional "natural monopoly" utilities have occurred: electricity generation has been restructured in some parts of the country; there is competition in natural gas midstream pipelines; and, for many, the telecommunications provider they primarily use is not considered a monopoly provider.[6] But many core features of regulation remain intact—and, to a large degree, unquestioned. It is time to more specifically address whether these key features are still appropriate in our changing world, or whether they should change with the changing climate.

Scholarly work has demonstrated that utilities face many climate-related vulnerabilities.[7] Transmission and distribution lines will be impacted by higher temperatures, generation plants will be impacted by droughts and storm surges, pipelines are subject to disruption, and water and sewer lines are already seeing impacts during more extreme weather events, to name a few.[8] This will require major changes in our utility system, such as "hardening" of utility infrastructure to deal with increasingly extreme weather events. At the same time, climate change is prompting other changes in our electricity system, like more renewable generation

4. *See* Jim Rossi, *The Common Law "Duty to Serve" and Protection of Consumers in an Age of Competitive Retail Public Utility Restructuring*, 51 VAND. L. REV. 1233 (1998).

5. *See* Fed. Power Comm'n v. Hope Nat. Gas Co., 320 U.S. 591 (1944); Pub. Utils. Comm'n v. Attleboro Steam & Elec. Co., 273 U.S. 83 (1927); Bluefield Water Works & Improvement Co. v. Pub. Serv. Comm'n, 262 U.S. 679 (1923).

6. Michael H. Ryan, *Telecommunications Carriers and the "Duty to Serve"*, 57 MCGILL L.J. 519, 538 (2012) ("Where the common law is concerned, however, the situation seems clear: the existence of a monopoly or near-monopoly is critical to the existence of a duty to serve and once that condition no longer obtains the common law duty to serve no longer arises") (noting how telecommunications are no longer a monopoly and therefore the duty to serve has disappeared).

7. *See, e.g.*, *Climate Impacts on Water Utilities*, EPA, https://www.epa.gov/arc-x/climate-impacts-water-utilities [https://perma.cc/L7KU-825B] (discussing water utilities).

8. And it is going to be expensive. *See* Utility Dive Team, *Climate Risks Are Accelerating. Here's What Duke, PG&E and 16 Other Utilities Expect to Pay.*, UTIL. DIVE (Nov. 18, 2020), https://www.utilitydive.com/news/climate-risks-accelerating-heres-what-costs-duke-pge-and-16-other-utilities-expect/588860 [https://perma.cc/EN8Z-ZDT9].

and energy efficiency, phasing out natural gas,[9] and building out grid technology to enable more demand response and flexibility.[10]

Some scholars have considered how all this might impact utility regulation.[11] They have largely centered their proposals within the current regulatory construct, advocating changes within that framework instead of fundamentally altering the overarching concepts of how we regulate utility monopolies.[12] However, climate change will require more than this. Without modification, the duty to serve will continue to exert force on utility actions and

9. Jeff St. John, *PG&E Gets on Board With All-Electric New Buildings in California*, GREENTECH MEDIA (June 26, 2020), https://www.greentechmedia.com/articles/read/pge-gets-on-board-with-all-electric-new-buildings-in-california [https://perma.cc/5ACC-GCKL] ("Pacific Gas & Electric has become the first combined natural gas and electric utility in California to express support for an emerging plan to require 'efficient, all-electric new construction' in the state, telling regulators that it wants to 'avoid investments in new gas assets that might later prove underutilized' under the state's long-term decarbonization goals.").

10. William Boyd, *Public Utility and the Low-Carbon Future*, 61 UCLA L. REV. 1614, 1623 (2014) ("Several of these identify 80 percent reductions in GHG emissions by 2050 as a benchmark—a very ambitious target that would require substantial increases in investment across all aspects of the power sector over the next several decades, regardless of the ultimate mix of technologies and resources."). As more of our electricity is generated using carbon-free means and more of our energy use is electrified, we will need more energy efficiency, so our electric load does not increase substantially. Maggie Molina, *Electrification and Efficiency: Crafting an Enduring Relationship*, AM. COUNCIL ENERGY-EFFICIENT ECONOMY (Jan. 31, 2019), https://www.aceee.org/blog/2019/01/electrification-and-efficiency [https://perma.cc/P33T-EET6].

11. *See, e.g.*, PAYAL NANAVATI & JUSTIN GUNDLACH, COLUM. L. SCH. SABIN CTR. FOR CLIMATE CHANGE L., LEGAL TOOLS FOR CLIMATE ADAPTATION ADVOCACY: THE ELECTRIC GRID AND ITS REGULATORS—FERC AND STATE PUBLIC UTILITY COMMISSIONS 6–7, 21 (2016), https://climate.law.columbia.edu/sites/default/files/content/docs/Nanavati-Gundlach-2016-09-Adaptation-Chapter-re-Elec-Grid_0.pdf [https://perma.cc/5D9P-RKZ8]; STEVEN WEISSMAN & ROMANY WEBB, U. OF CAL., BERKELEY, SCH. OF L. CTR. FOR L., ENERGY & THE ENV'T, ADDRESSING CLIMATE CHANGE WITHOUT LEGISLATION 1–3 (2014); Boyd, *supra* note 10, at 1623; Jim Rossi, *The Political Economy of Energy and Its Implications for Climate Change Legislation*, 84 TUL. L. REV. 379, 380–81 (2009).

12. *See* Boyd, *supra* note 10, at 1618 ("The planning, sequencing, and financing of hundreds of billions of dollars in new investments needed to modernize the electric power grid and build new low carbon generation will require a level of certainty . . . ."). Note that this Article will not be detailing the risks to specific generation resources that may exist and should also be addressed through appropriate regulatory forums, such as potential impact of climate risks on nuclear plants. *See, e.g.*, Jared Anderson, *Nuclear Plant Climate Change Risk Assessment, Action Plans Needed: Researchers*, S&P GLOBAL, (Nov. 12, 2019, 21:59 UTC), https://www.spglobal.com/platts/en/market-insights/latest-news/electric-power/111219-nuclear-plant-climate-change-risk-assessment-action-plans-needed-researchers [https://perma.cc/YWL2-TE92]. While ratepayers may be tasked with paying for resilience improvements at certain plants in vertically integrated markets, that will not be universally true. Therefore, I am limiting my discussion here to those assets which remain regulated as a natural monopoly everywhere in the United States. This is not to argue that no changes have been made in the past century to the utility model, especially with generation. *See, e.g.*, Fessler & Morelli, *supra* note 3, at 558 (discussing how the Public Utility Regulatory Policies Act "concept destroyed the utility monopoly on generation . . .").

regulatory decisions, regardless of any steps utilities take to address climate impacts.[13]

The concept of the duty to serve is coming up against another core feature of utility regulation: prudency. A utility may only recoup those costs which were prudently incurred.[14] But at present, no utility can decide that any specific expense taken to respond to climate impacts is imprudent; if that customer is within their geographic service territory, the utility has a duty to serve them. Climate change is demonstrating that this traditional view of the duty to serve is, in fact, imprudent, and is leading utilities to make imprudent decisions. The concept of prudency, ever nebulous, will need to be put to new use, where prudent decisions can be re-evaluated due to climate change's impacts on utility infrastructure.

This Article argues that we should not automatically assume that always serving every customer in a utility's service territory is prudent. In some situations, the socialized cost of service is simply too high, and the certainty around further climate impacts is too certain. That is, prudent decisions around utility service going forward may have to allow the utility to stop serving some customers, or never start serving them in the first place.

Making the doctrinal change will not be easy. The justifications for the duty to serve make it difficult to modify. As is well documented by Professor Jim Rossi, the duty to serve consists primarily of two interrelated obligations: (1) "the duty to interconnect and extend service if requested"; and (2) the duty to continue service once it has commenced.[15] This Article argues that the reasons we would want the duty to serve to remain fully intact do not address the reality we are facing with climate change and that we now need to look at how we should modify the duty to serve. Climate change realities mean legislatures and regulators must address both

13. The action should be legislative or regulatory rather than judicial—with the common law underpinnings of the duty to serve, explicit actions will be better, with legislative preferred over regulatory for political accountability reasons.

14. Scott Hempling, *Regulatory Expense: Is Asymmetry Inevitable?*, SCOTT HEMPLING, ATT'Y AT L. LLC (Feb., 2015), https://www.scotthemplinglaw.com/essays/regulatory-expense [https://perma.cc/Y55R-3CB9] ("Those legal sources entitle the utility to charge rates calculated to give the utility a reasonable opportunity to recover its prudent costs and earn a fair profit."); *see also* Sonnet C. Edmonds, *Retail Electric Competition in Kansas: A Utility Perspective*, 37 WASHBURN L.J. 603, 604 (1998) ("The utility must serve all customers within its designated service territory. In return for undertaking this obligation to serve, the KCC allows an electric utility to recover all prudent expenses incurred to provide service.").

15. Jim Rossi, *Universal Service in Competitive Retail Electric Power Markets: Whither the Duty to Serve?* 21 ENERGY L.J. 27, 29 (2000).

prongs of the duty to serve—expansion and continuation of utility service. The implications and equity concerns around each will be unique.

Addressing these intertwined issues would allow regulators to give utilities more certainty that expenses made in responding to climate change are prudently incurred. But, we can only get to that point by allowing public utility commissions ("PUCs") to determine sooner, rather than later, that climate impacts make the socialized cost of serving some individual customers too high.[16] Without this, utilities will simply argue that existing obligations require them to provide service in all circumstances in which it can be safely done—and that addressing existing obligations is prudent.[17] It is therefore clear that utilities would think that "the prudency of such action should be relatively easy to defend."[18]

Part I explains the duty to serve, the reasons for departing from it in some cases, and the common issues that regulators will need to address and that they should start thinking about them now, including how and when the duty to serve becomes too expensive for utilities to fulfill. At its core, modifying the duty to serve is a regulatory response to a utility-law-specific problem. But at the same time, it is much more than that: it is an enabler to broader strategies of adaptation, managed retreat, and infrastructure spending.[19] Without modifying the duty to serve, waste is likely to

16. J. Gregory Sidak & Daniel F. Spulber, *Deregulatory Takings and Breach of the Regulatory Contract*, 71 N.Y.U. L. REV. 851, 986 (1996) ("If regulators pursue predictable policies and if investors do not anticipate fluctuations in earnings caused by disallowances of capital expenditures through prudency reviews, endogenous risk is minimized.").

17. Without modifying the duty to serve, that restoration is prudent because utility management has no "substantial control" over whether or not to do it: they must. *See generally* ROBERT BURNS, ROBERT POLING, MICHAEL WHINHAN & KEVIN KELLY, NAT'L REGUL. RSCH. INST., THE PRUDENT INVESTMENT TEST IN THE 1980S vi (1985) (discussing how regulators use the prudence test "to hold utilities responsible for the risks over which management has substantial control").

18. JUDITH M. MATLOCK, ROCKY MTN. MIN. L. FOUND., CONTRACT CONSIDERATIONS FOR ALL BUYERS AND SELLERS (1993).

19. *See Managed Retreat Toolkit: Crosscutting Legal Considerations*, GEO. CLIMATE CTR., https://www.georgetownclimate.org/adaptation/toolkits/managed-retreat-toolkit/crosscutting-legal-considerations.html [https://perma.cc/5ELM-2GCY] (noting potential for takings issues and that managed retreat "must take account of applicable law"). Additionally, even when a community does retreat, utility infrastructure is still present. *See* KATIE SPIDALIERI, ISABELLE SMITH & JESSICA GRANNIS, GEO. CLIMATE CTR., MANAGING THE RETREAT FROM RISING SEAS: LESSONS AND TOOLS FROM 17 CASE STUDIES (2020), https://www.georgetownclimate.org/files/MRT/GCC_20_FULL-3web.pdf [https://perma.cc/CS8G-Y9BC]. Eventually, however, retreat is unavoidable. U.S. GOV'T ACCOUNTABILITY OFFICE, HIGHLIGHTS OF GAO-20-488 CLIMATE CHANGE: A CLIMATE MIGRATION PILOT PROGRAM COULD ENHANCE THE NATION'S RESILIENCE AND REDUCE FEDERAL FISCAL EXPOSURE (2020), https://www.gao.gov/assets/gao-20-488-highlights.pdf [https://perma.cc/JX2D-HRPX]; *see*

occur. Part II explains this and discusses how a regulatory framework with a reconceptualization of the duty to serve will, in the end, be more prudent, economic, and fair for all ratepayers. It accomplishes this by discussing when a utility action to meet the duty to serve is no longer prudent (which requires redefining "prudent"); what criteria must be used to re-evaluate prudency; and when PUCs should step in to require utilities to bypass their profit motives and modify the duty to serve.

When looking to modify the duty to serve, legislatures and regulators can learn from other areas of the law that have addressed similar socialized risk problems. Part III looks to the National Flood Insurance Program and the Price-Anderson Act for lessons that could be applied (or actions that should be avoided) as the duty to serve is modified. Modifying the duty to serve will have differing impacts on utilities, on regulators, and on customers. This Article argues that given the accelerating impacts of climate change, costs associated with keeping the duty to serve as is will eventually bring about economic injustice, and reconceptualizing it may ameliorate these impacts. Part IV discusses this, and how the modification of the duty to serve should not be considered a regulatory taking.

I. THE DUTY TO SERVE

While multiple models exist for monopoly utility ownership—investor-owned, municipal, cooperative, service-specific utility districts[20]—they are all united in that each utility, regardless of ownership structure, operates within a monopoly service territory, within which no other utility of the same type may function.[21] How those territories are set is a state-by-state determination.[22]

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also Christopher Flavelle, *U.S. Flood Strategy Shifts to 'Unavoidable' Relocation of Entire Neighborhoods*, N.Y. TIMES (Aug. 26, 2020), https://www.nytimes.com/2020/08/26/climate/flooding-relocation-managed-retreat.html [https://perma.cc/BDT3-BSPE].

20. JIM LAZAR, THE REGULATORY ASSISTANCE PROJECT, ELECTRICITY REGULATION IN THE US: A GUIDE 11–12 (2d ed. 2016), http://www.raponline.org/wp-content/uploads/2016/07/rap-lazar-electricity-regulation-US-june-2016.pdf [https://perma.cc/XBK5-MJ4D].

21. *See* John Farrell, *How Market Power Gives Electric Utilities Political Power*, INST. FOR LOC. SELF-RELIANCE (Nov. 11, 2019), https://ilsr.org/how-market-power-gives-electric-utilities-political-power/ [https://perma.cc/YJ4J-29G4] (discussing the differences between the models and providing a map of where electric cooperatives are located).

22. *See* Richard C. Bellack & Martha Carter Brown, *Drawing the Lines: Statewide Territorial Boundaries for Public Utilities in Florida*, 19 FLA. ST. U. L. REV. 407, 412–13 (1991) ("In the electric and gas industries, utilities submit agreements with other utilities that propose boundaries between their respective service territories. The Commission reviews

The common feature among the states is that, in exchange for monopoly rights within a specific territory, the utility both "submits to price regulation" and has a duty to serve customers in that territory in a nondiscriminatory way.[23] All customers within that service territory have the expectation of utility service by that monopoly entity.[24]

In addition to the current statutory or regulatory formulations, the duty to serve has a long history in common law.[25] Indeed, courts have recognized that "the duty to serve would exist without the statute, for it results from the acceptance of the franchise of a public service corporation."[26] "For hundreds of years, public utilities have assumed obligations to extend service to customers within their service territories and to continue providing service once service has commenced."[27] While feudal mills and ferries provided much of the initial background against which American courts described the duty to serve, many of the early U.S. cases dealt with railroads.[28] The duty to serve was then expanded to gas companies and water suppliers, often based on the common law and without any independent statutory authorization.[29]

While the duty for utilities may have been enshrined in law decades (or even centuries) ago,[30] it has rarely been commented on in

each agreement and may or may not approve the allocation of territory. Where disputes arise between electric or gas utilities, the service territories are allocated through Commission resolution of the dispute.").

23. Rossi, *supra* note 15, at 27; *see also* Rossi, *supra* note 11, at 383 ("Under the traditional approach to natural monopoly regulation of gas and electric utilities, regulators define a franchise service area for a public utility, guaranteeing it access to customers within this area.").

24. Rossi, *supra* note 4, at 1252–53 ("Although the states differ in the details, the basic modern rule for the extension of service generally accepted by all fifty states is that a utility can be required by a regulatory authority to make all reasonable additions within the area to which it has dedicated its services, but that no extensions can be mandated outside of that area.").

25. *Id.* at 1239 ("Although it has been largely supplanted in the modern age by regulations implemented by utility governing boards or by voluntary tariffs, the public utility duty to serve has some foundation in the common law regulation of mills, ferries and the like.").

26. Tismer v. N.Y. Edison Co., 228 N.Y. 156, 161 (1920).

27. Rossi, *supra* note 4, at 1236.

28. *Id.* at 1244–48.

29. *Id.* at 1248–49.

30. "To use the familiar phraseology of Lord Hale, when does a business 'cease to be *juris privati* only' and become 'affected with a public interest,' so that it may be regulated as a public service? Before attempting to answer this question, which has been variously answered by various authorities and is not yet definitely settled, it will be well to remember that all businesses, private and public, are, of course, subject to governmental regulation of a sort. But there is in one respect an important difference between the sort of governmental regulation to which private businesses may be constitutionally subjected and the sort of

the literature since its outlines were agreed upon.[31] We have seen even more clearly how, with a pandemic like COVID-19, regulatory policies around service, connections, and disconnections can impact citizens.[32] Without electricity, it is impossible to work or attend school remotely. Without running water, it is impossible to wash hands frequently to minimize spread of the virus. And yet, we must address whether the basic idea of the duty to serve, even as it has taken on added importance, needs to develop given climate change and our increased exposure to natural disasters.

Importantly, the modification of the duty to serve due to climate change must impact both prongs—it must address both service expansion and service continuation. While these bring up different issues for legislators, regulators, and the public, both prongs present challenges to living in a changing world.

To understand how the duty to serve should be modified to account for climate change and the new risks associated with it, this section will start by looking at how the duty is defined by the states, and how infrequently it has been found not to apply or has been allowed to be modified.

A. *How the Duty Is Defined*

Some form of the obligation or duty to serve exists basically everywhere in the United States, adopted through statute, regulation, or by court opinion.[33] For as significant as energy law scholars view

governmental regulation to which public businesses may be constitutionally subjected. The difference is not merely one of degree; it is one of kind. Generally speaking, governmental regulations in regard to private business are negative in character; governmental regulations in regard to public business, that is, in addition to negative regulations generally applicable to private business, are positive in character. The law says to those engaged in private enterprises: In conducting your business you must not do this or that, e.g., *sic utere tuo ut alienum non laedas,* which maxim is in essence a negative requirement not to use one's own so as to injure another. But to those engaged in 'public businesses the law also says (or may say): In conducting your business you must do this or that, e.g., you must serve all, as a rule, and you must serve for a reasonable compensation." T.P.H., Note, *New Public Utilities*, 28 W. VA. L. REV. 213–14 (1922) (journal known as *West Virginia Law Quarterly* when Article was published).

31. Of course, with the very notable exception of Jim Rossi's work.

32. *Summary of State Utility Shut-Off Moratoriums Due to COVID-19*, NAT'L ENERGY ASSISTANCE DIRS. ASS'N, https://neada.org/utilityshutoffsuspensions/ [https://perma.cc/86HH-T2T2] (noting that "[a]n estimated 205.4 million people across the U.S. are already at risk of utility disconnections").

33. *See* App. A. Nebraska, interestingly, does not term the duty they have adopted as either a duty to serve or an obligation to serve, but rather uses the "public policy to serve" as the basis for requiring utilities to provide nondiscriminatory service within their geographic territories. NEB. REV. STAT. § 70-1101 (1963).

the duty to serve in monopoly utility regulation,[34] the duty is rarely expressed clearly in the state law which governs the obligations of public utilities. The pronouncements also focus much more on the extension prong of the duty to serve, with basically nothing statutorily defining the continuation prong.

> Although the states differ in the details, the basic modern rule for the extension of service generally accepted by all fifty states is that a utility can be required by a regulatory authority to make all reasonable additions within the area to which it has dedicated its services, but that no extensions can be mandated outside of that area.[35]

Most frequently, the contours of the duty discuss that the utility is to provide sufficient facilities to promote health and safety.[36] Another common requirement is that utility service is to be just and reasonable.[37]

Other states are more prescriptive when determining utility requirements under the duty to serve. Some specifically mention geographic territories when discussing the duty to serve.[38] Others are more explicitly antidiscriminatory,[39] although New Jersey phrases

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34. *See, e.g.*, JOEL B. EISEN, EMILY HAMMOND, JIM ROSSI, DAVID B. SPENCE & HANNAH J. WISEMAN, ENERGY, ECONOMICS AND THE ENVIRONMENT 57 (Saul Levmore et al. eds., 5th ed. 2020) ("Courts have used four different rationales [in imposing] the obligation to furnish adequate supply or service without discrimination: . . . (2) The duty to serve all equally, inferred from and recognized as an essential part of natural monopoly power; (3) The duty to serve all parties alike, as a consequence of the grant of the privileged power of eminent domain; and, finally, (4) The duty to serve all equally, flowing from consent, expressed or (more frequently) implied." (emphasis omitted)); *see also id.* at 69 (noting the duty to serve as one of six key features of public utilities).

35. Rossi, *supra* note 4, at 1252–53.

36. *See, e.g.*, ARK. CODE ANN. § 23-3-113 (2021) ("Every public utility shall furnish, provide, and maintain such adequate and efficient service, instrumentalities, equipment, and facilities as shall promote the safety, health, comfort, requirements, and convenience of its patrons, employees, and the public.").

37. *See, e.g.*, GA. CODE ANN. § 46-2-20(c) (2021) ("The commission may, either by general rules or by special orders in particular cases, require all companies under its supervision to establish and maintain such public services and facilities as may be reasonable and just."); IDAHO CODE § 61-302 (2021) ("Every public utility shall furnish, provide and maintain such service, instrumentalities, equipment and facilities as shall promote the safety, health, comfort and convenience of its patrons, employees and the public, and as shall be in all respects adequate, efficient, just and reasonable.").

38. *See* ALA. CODE § 37-1-49 (2021) ("[A]s may be necessary to meet the growth and demand of the territory which it is under the duty to serve."); CONN. GEN. STAT. § 16-20(b) (2021) ("If any public service company or private water company unreasonably fails or refuses to furnish adequate service at reasonable rates to any person within the territorial limits . . . ."); 220 MASS. CODE REGS. 11.04(9)(a) (2019) ("Each Distribution Company shall have the obligation to provide Standard Offer Generation Service and Default/Basic Generation Service to Customers within its Service Territory . . . .").

39. *See* FLA. STAT. § 366.03 (2021) ("No public utility shall make or give any undue or unreasonable preference or advantage to any person or locality, or subject the same to any under or unreasonable prejudice or disadvantage in any respect."); 220 ILL. COMP. STAT.

this obligation as a negative—the inability to withhold service.[40] Some states do condition the duty to serve: Louisiana, on the ability of the utility to make money in providing that service;[41] Minnesota, by placing a time limit on how long a utility may take before it provides service;[42] Tennessee, on any extension of service being reasonable and practicable;[43] Virginia, on the lines already being installed.[44]

Service expansion may be required even when serving that specific customer would not be profitable for the utility[45]—service may be required "when the cost of providing service to a customer is in excess of the anticipated revenue from that customer."[46] "The

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ANN. 5/8-101 (2021) ("A public utility shall, upon reasonable notice, furnish to all persons who many apply therefor and be reasonably entitled thereto, suitable facilities and service, without discrimination and without delay."); WYO. STAT. ANN. § 37-3-112 (2021) ("It shall be unlawful for any public utility to make or permit to exist any unjust discrimination or undue preference with respect to its service, facilities or service regulations."); Okla. Gas & Elec. Co. v. Wilson & Co., 288 P. 316, 322 (Okla. 1930) ("Where a public utility has undertaken and professes to serve the inhabitants of certain cities and towns within the state with natural gas, the Corporation Commission has power within constitutional and reasonable limitations to compel such utility to serve all inhabitants thereof who may apply for such service.").

40. N.J. STAT. ANN. § 48:3-3(a) (West 2021) ("No public utility shall provide or maintain any service that is unsafe, improper or inadequate, or withhold or refuse any service which reasonably can be demanded or furnished . . . .").

41. LA. STAT. ANN. § 45:122 (2021) ("The Louisiana Public Service Commission has authority to require electric public utilities furnishing electricity to make extensions of their services and facilities whenever the revenues to be derived from the proposed extensions will be sufficient to provide a fair return upon the fair value of the facilities used and useful in rendering additional service.").

42. MINN. STAT. § 216B.04 (2021) ("Every public utility shall furnish safe, adequate, efficient and reasonable service; provided that service shall be deemed adequate if made so within 90 days after a person requests service.").

43. TENN. CODE ANN. § 65-4-114 (2021) ("The commission has the power . . . to require every public utility . . . to . . . [e]stablish, construct, maintain, and operate any reasonable extension of its existing facilities where, in the judgement of the commission, such extension is reasonable and practicable, and will furnish sufficient business to justify the construction, operation, and maintenance of the same, and when the financial condition of the public utility affected reasonably warrants the original expenditure required in making such extension . . . .").

44. VA. CODE ANN. § 56-234(A) (Repl. Vol. 2019) ("It shall be the duty of every public utility to furnish reasonably adequate service and facilities at reasonable and just rates to any person, firm or corporation along its lines desiring same.").

45. Rossi, *supra* note 4, at 1255–56 ("Utility extension cases tend to focus on the financial burden of extension, but most cases preclude a utility from refusing to extend service simply because it is not profitable. In fact, the main distinguishing feature of the utility duty to extend service that does not apply to an ordinary, unregulated business is that service extension may be compelled even where it is not profitable to the utility in the short term.").

46. Rossi, *supra* note 4 at 1236. This idea has been recently affirmed; a presentation on behalf of the National Association of Regulatory Utility Commissioners ("NARUC") stated that "[a] public utility must hold itself out to provide service on reasonable terms to all who desire service within the utility's franchised territory" and "[a] public utility is not free to

extension duty requires public utilities to build facilities at least to a property line and to provide adequate pressure or power to transport service to the customer, even if the customer could not pay for the cost of extending service."[47]

This made sense from a nondiscriminatory perspective. As monopolies, utilities could use their power to maximize profit rather than promote the general welfare, while regulatory commissions (and courts) ensured that they did not only serve profitable customers. "Corporations which devote their property to a public use may not pick and choose, serving only the portions of the territory covered by their franchises which it is presently profitable for them to serve and restricting the development of the remaining portions by leaving their inhabitants in discomfort without the service that they alone can render."[48] However, whether we want each parcel of land developed is a question that may need to be answered differently as we address a changing climate.

While the extension prong of the duty to serve is typically thought of as an affirmative duty—that utility service must be available to customers within the utility's franchise area—there is also the flip side. The duty to serve also encompasses a second prong—an obligation to continue service after it has commenced. As noted above, there is much less discussion of the continuation prong of the duty to serve, either in statute or in court cases. However, at least one recent case noted that utilities were not responsible for damages when they did not shut off service during a weather event made more extreme by climate change—indeed, it found that utilities have no statutory or regulatory duty to preemptively suspend service to address climate threats, and instead that the duty to serve mandated continuing service to those residents who failed to heed the mandatory evacuation order.[49]

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choose to serve only those customers which it is convenient." Robert W. Kehres, *Obligation to Serve and Economic and Legal Incentives,* NAT'L ASSOC. OF REG. UTIL. COMM'RS (Nov. 30–Dec. 6, 2008), https://pubs.naruc.org/pub.cfm?id=53858446-2354-D714-5131-AC518E6391BC [https://perma.cc/6ASU-8C7Y].

47. Rossi, *supra* note 4, at 1252.

48. New York ex rel. New York & Queens Gas Co. v. McCall, 245 U.S. 345, 351 (1917).

49. Roudi v. Jersey Cent. Power & Light, Nos. A-1505-18T1, A-1513-18T1, A-1516-18T1, 2020 N.J. Super. Unpub. LEXIS 608, at *2, *14–15 (N.J. Super. Ct. App. Div. Apr. 3, 2020). *But cf.* STATE OF HAW. PUB. UTIL. COMM'N, GEN. ORDER NO. 7, STANDARDS FOR ELECTRIC UTILITY SERVICE IN THE STATE OF HAWAII § 4.6(a), https://puc.hawaii.gov/wp-content/uploads/2013/04/General-Order-7.pdf [https://perma.cc/LZ8K-8WCP] (noting that utilities may deny service "[w]ithout notice in the event of a condition determined by the utility to be hazardous").

Temporary shut-offs for nonpayment were also treated differently by regulators—they were not analyzed under the continuation prong of the duty to serve—as these did not modify the potential for that location to receive utility service in the future.[50] While some consumer protections were put in place—mandating continuing service while there was a payment dispute, for example—these situations were not seen as implicating the duty to serve because the property could return to full utility service simply with the debt owed being paid.[51]

B. *Ability of Duty to Be Modified or Service to Permanently Cease*

Calls for modifying the duty to serve have occurred in other monopoly industries but have not yet occurred in the electric or natural gas realm, or with water or sewer utilities.[52] There have been a very limited number of instances in which regulators have allowed any modification of a duty to serve in the past. Modifications of the duty to serve have generally happened in only two ways: first, where utility service would be provided by another utility;[53] and second, where the utility initiated abandonment proceedings.[54] Modifications with changes in utility geography—basically, when service would shift from one utility to another—did happen, but those were mostly transparent to the customer, as they still had service.[55] That service was simply being provided by another entity. Given the lack of impact on the customer, the change was minimal. While it modified the duty to serve for both utilities, it did not have any real impact.

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50. *See* Rossi, *supra* note 4, at 1258–59. For more information on this topic, see Brad Plumer & Ivan Penn, *Climate Crisis Catches Power Companies Unprepared*, N.Y. TIMES (Jul. 29, 2021), https://www.nytimes.com/2021/07/29/climate/electric-utilities-climate-change.html [https://perma.cc/YQ3R-5PS4] (addressing the issues regulators must face when utilities must be temporarily disconnected due to wildfire or other potential issues).

51. Rossi, *supra* note 4, at 1258 ("Modern regulatory commissions and courts distinguish between abandonment—permanent suspension of service to customer—and shut-off—temporary discontinuation of service.").

52. *See, e.g.*, Michael H. Ryan, *Telecommunications Carriers and the "Duty to Serve,"* 57 MCGILL L.J. 519 (2012) (detailing arguments for modifying telecommunications companies' duty to serve).

53. *See, e.g.*, Bellack & Brown, *supra* note 22, at 408–12.

54. *See, e.g.*, Pennsylvania Public Utility Commission, No. A-2011-2239521, 2012 Pa. PUC LEXIS 1361 (Application of NRG Energy Center Harrisburg LLC for approval to abandon steam service, joint settlement); Pennsylvania Public Utility Commission, Docket No. C-20032233 (UGI Utilities, Inc.—Gas Division, Statement of the Office of Consumer Advocate in Support of the Joint Stipulation in Settlement of Consolidated Proceedings).

55. *See* Bellack & Brown, *supra* note 22, at 420–21.

The other way a utility could modify its duty to serve was through abandonment proceedings. In abandonment proceedings, the utility regulator would determine what was required by the utility in order to allow the utility to cease service to specific customers. The cases that arose tended to focus on "standards of reasonableness in the event of a utility abandonment or cut-off of all or part of its service."[56] Regulators "generally grant permission to abandon if the utility can show it no longer has a franchise to serve, public demand is minimal, a shortage of supplies exists, operation is at a substantial economic loss, or customers have failed to meet necessary conditions for receiving service."[57]

With these very limited exceptions, once monopoly utility service begins, the traditional understanding of the duty to serve eliminated any possibility of service being removed by the utility.[58] For the reasons discussed below, both prongs of the duty to serve—the expansion prong and the continuation prong—may need to change as we adapt our utility regulatory framework to climate change.

C. *Social Waste and Moral Hazard*

While the brute force impacts from climate change—wildfire, sea level rise, more extreme storms—provide one basis for modifying the duty to serve, the economic efficiency arguments for the duty to serve and the moral hazard involved provide others. This section will first review the efficiency arguments, detailing how the assumptions made are no longer valid, and follow with the discussion around moral hazard.

1. Economic Efficiency/Social Waste

The common expectation of service—both of service expansion and of service continuation—allows the utility to socialize the costs of serving hard-to-serve (or expensive-to-serve) customers across their entire customer base. The duty to serve was in fact designed to do precisely that: to ensure that all customers would have access

56. Rossi, *supra* note 4, at 1257.

57. *Id.* at 1258.

58. I say the possibility of service because the utility may disconnect customers or properties for specific reasons temporarily. These may be due to inaction by the customer (lack of bill payment) or for safety reasons (Public Safety Power Shutoffs during high winds in California, for example). But these events do not permanently modify the ability of the property to be served by the monopoly utility going forward. Abandonment proceedings do, removing the requirement for service permanently.

to the "necessities of life," rather than just those to whom it might be granted profitably from the utility's perspective.[59]

Socializing the costs of utility infrastructure has worked well and has enabled those who would otherwise be priced out of utility service to be served. "The common law duty to serve, encompassing both service extension and continuation obligations, has a strong basis in economic efficiency."[60] But it has also enabled utilities to build what has become dangerous infrastructure and then socialize those costs across all ratepayers.

Indeed, the original economic efficiency arguments provided, especially for the service continuation prong of the duty to serve, are no longer valid under the climate change scenarios utilities are currently facing. Continuing service—in addition to providing benefits for the specific customers who continued to have access to utilities—was actually seen as a benefit for the rest of the ratepayers.[61] The argument went like this: so long as the potentially cutoff customer was paying at least as much as the marginal rate—so, for electricity, for the fuel use to produce that electricity, or for gas, for the cost of the gas consumed—they were covering the "consumable" (operations and maintenance) part of their charges, and *anything* that they paid in addition to that was going to pay for the capital invested in the system.[62] Any amount being paid toward the capital was a benefit for other ratepayers since otherwise, the cost of the capital invested by the utility in equipment was going to be paid for by them.[63] So keeping a customer, even if they were not paying their entire fair share, made it so the remaining customers paid slightly less.[64]

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59. When utility law and the duty to serve were being developed, many of those who lacked electricity were rural customers—and they had not had service extended to them precisely because they were harder and more costly to serve, based on the longer distribution infrastructure that was necessary to provide them service. The duty to serve was partially designed to ensure these customers had access.

60. Rossi, *supra* note 4, at 1234, 1273; *see also* Amy L. Stein, *Distributed Reliability*, 87 U. COLO. L. REV. 887, 902 (2016) ("Imposing a duty to serve on electric utilities made sense for practical reasons as well. For a hundred years, reliability of the electric grid was handled primarily 'in house' by a vertically integrated utility. This utility controlled all three components of the electric grid: generation, transmission, and distribution facilities. The utility provided electricity for ratepayers within a state-defined service territory, owning the assets that provided these services and obtaining rate-based compensation for them.").

61. Rossi, *supra* note 11, at 390.

62. *See id.*

63. *See id.* at 389–90.

64. *See id.* ("Under the natural monopoly regulatory framework, the duty to provide service, even where it is not immediately profitable, presented some benefits to producers as well as to consumers. An electric or gas utility was allowed to seek compensation for the

The challenge with this analysis is that it assumes new capital will not be required to be spent to continue service for that particular customer, but rather that all capital needed to continue service for that customer has already been spent and is already part of the rate base. With climate change, that will not be the case. It will be necessary for utilities to spend capital—and then more capital—on the infrastructure necessary to continue service to these customers.[65] The cost of that capital will then—as with all other capital spent by the utility—be socialized to other customers within that same rate class. I argue that if this is the situation, the economic efficiency argument for continuing the duty to serve no longer makes sense. With climate change, the continuing service prong is not just dealing with marginal costs, but much more significant outlays of capital.

Essentially, customers who do not need similar, frequent outlays of capital will be subsidizing those that do. So, customers who are cheaper to serve will be paying higher bills to cover the cost to serve customers who are living in locations subject to frequent climate change impacts, leading to significant cross-subsidization within a given customer class.

This is, by no means, a unique circumstance. Think of the U.S. Postal Service. Political interference notwithstanding, I can put a first-class stamp on a letter, drop it in the mail, and it will be

costs of providing service through regulated rates . . . . The service continuation obligation facilitated intra-class cross-subsidization by building into all customers' rates the costs of customers who cannot afford to pay the full costs of their bills. Although this likely led to mismatches between any one customer's costs and rates, it allowed utilities to spread these risks among all customers and thus was not necessarily inefficient. When a utility removed a customer who could not afford full payment from its system by disconnecting service, two things occurred. First, the utility avoided the variable costs of producing energy, typically the price of the fuel required to deliver the units of energy to the customer. Second, because service continuation gave the utility leverage in collection, the utility forewent any revenue that it might have been able to collect from the household if service were continued. So, assuming excess capacity, there may have been a general economic advantage to all ratepayers in keeping as many customers as possible on the system. Service continuation obligations allowed the utility to spread fixed costs (for existing capacity) over a larger number of customers and to reduce the portion of each customer's bill allocated to fixed costs. Thus, even in the event of 'nonpayment, it may be cost-effective for a utility with excess capacity to continue service to a customer and to accommodate the nonpaying customer by working out a partial payment plan, so long as it [is] reasonably expected that the customer can pay at least the variable cost of service.'").

65. *See* Julie McNamara, *Utility Restoration Workers a Large Factor in Speed—and Cost—of Hurricane Response,* THE EQUATION (Sept. 24, 2019), https://blog.ucsusa.org/julie-mcnamara/utility-restoration-workers-speed-cost-hurricane-response/ [https://perma.cc/B4CX-VVVM]; Sarah Ravits, *New Orleans Could See Entergy Bill Hike to Cover Company's Ida Recovery Costs*, GAMBIT (Sept. 1, 2021), https://www.nola.com/gambit/news/the_latest/article_6cd4242c-0b61-11ec-9041-43468ba150c6.html [https://perma.cc/W65Z-3YJF].

delivered anywhere in the United States. If the origin of the letter is New Jersey, it will cost significantly different amounts to deliver that letter to New York, California, or Alaska—but I pay the same price, regardless of the destination. All the letters being mailed short distances with relatively dense delivery routes which therefore cost less than the price of the stamp to process and deliver, subsidize the letters that need to go vast distances and be delivered by floatplane, the processing and delivery of which cost more than the price of the stamp.

Cross-subsidization is also not unique in the energy sphere. It has long been accepted that cross-subsidization occurs within rate categories (dense urban customers, for example, often subsidize service for suburban or rural customers) and cross-subsidization has frequently been invoked by utilities as the reason to stop paying distributed energy resources the full retail rate for the energy they produce.[66]

This Article is not suggesting that all cross-subsidization in utility rates should end—although this is a long-held but seldom-realized goal of many utility regulators—but rather that current capital assumptions, and therefore rates within set rate classes, are premised on equal burdens of service. Those assumptions are not

66. *See* Boyd, *supra* note 10 at 1676–79 ("As more customers take advantage of incentives and support programs for these various distributed energy resources, systems costs are increasingly shifted to nonparticipating customers . . . ."); *see also* Shelley Welton & Joel Eisen, *Clean Energy Justice: Charting an Emerging Agenda*, 43 HARV. ENV'T L. REV. 307, 325 (2019). Even with the complaints from utilities, however, full retail rate net metering continues to exist. There are even some studies that suggest the cross-subsidization occurs the other way—that homeowners with distributed generation are providing more value to the grid than the retail rate, and therefore that those homeowners are subsidizing customers without solar. *See, e.g.*, Herman K. Trabish, *How Two Value-of-Solar Studies Add Up to No Clear Value of Solar*, UTIL. DIVE (May 10, 2018), https://www.utilitydive.com/news/how-two-value-of-solar-studies-add-up-to-no-clear-value-of-solar/522892/ [https://perma.cc/BWG9-HNVK]; *Value of Solar*, SOLAR UNITED NEIGHBORS, https://www.solarunitedneighbors.org/learn-the-issues/value-of-solar/ [https://perma.cc/9GKC-5AWN]; LINDSEY HALLOCK, FRONTIER GRP. & ROB SARGENT, ENV'T AM. RSCH. & POL'Y CTR., SHINING REWARDS THE VALUE OF ROOFTOP SOLAR POWER FOR CONSUMERS AND SOCIETY 4 (2015), https://environmentamerica.org/sites/environment/files/reports/EA_shiningrewards_print.pdf [https://perma.cc/4QZP-HSCZ] ("A review of 11 recent analyses shows that individuals and businesses that decide to 'go solar' generally deliver greater benefits to the grid and society than they receive through net metering."). What is certainly true is that "utilities and solar advocates differ on the cost-benefit balance at the higher penetrations now forecast by the U.S. Energy Information Administration, the Solar Energy Industries Association (SEIA), and others." Herman K. Trabish, *The Search for the Next Net Metering Policy Takes Center Stage in California*, UTIL. DIVE (Dec. 23, 2020), https://www.utilitydive.com/news/the-search-for-the-next-net-metering-policy-takes-center-stage-in-californi/589060/ [https://perma.cc/9HXY-B67U] (also noting that discussions are premature in most places due to low solar penetration).

true today and will become less true with climate change.[67] I am positing that if there are differentiated requirements for service, especially capital outlay or frequency, due to climate change, those should be taken into account in rates, and as a result, cross-subsidization in those instances should be ceased accordingly.

2. Moral Hazard

Utilities serving properties that will be impacted by climate change are almost a textbook example of moral hazard[68]—they have every incentive not to guard against risk as they are protected from consequences by the ability for their costs to be borne by captive customers, with all prudent costs allowed to be recovered. As discussed below, utilities will, especially without any modification to the duty to serve, assume that every customer they serve today is a customer forever.

There are also multiple moral hazards on the customer side in terms of location and not addressing the impacts of climate change. The National Flood Insurance Program,[69] federal funding for beach renourishment,[70] federal expenditures for wildfire suppression and fighting,[71] and disaster recovery funds[72] all lessen the individual financial implications of climate change for living on property at higher risk. In the private market, homeowners' insurance can similarly insulate from the full burden of living in risky locations,

67. I am not arguing, for example, that rural customers should be charged more for the same service, just because they are rural.

68. "Moral hazard, the risk one party incurs when dependent on the moral behavior of others. The risk increases when there is no effective way to control that behavior. Moral hazard arises when two or more parties form an agreement or contractual relationship and the arrangement itself provides the incentive for misbehavior by insuring one party against responsibility." *Moral Hazard*, ENCYC. BRITANNICA, https://www.britannica.com/topic/moral-hazard [https://perma.cc/GRR8-AZXD].

69. *Flood Insurance*, RISK MGMT. & PROCESSES CTR., WHARTON, UNIV. OF PA., https://riskcenter.wharton.upenn.edu/flood-insurance/ [https://perma.cc/V8HT-7FVW].

70. *See generally*, COMM. ON BEACH NOURISHMENT & PROT. MARINE BD., COMM'N ON ENG'G & TECH. SYS. & NAT'L RES. COUNS., *The Federal Role in Beach Nourishment*, *in* BEACH NOURISHMENT & PROTECTION 58 (1995); Lisa Song & Al Shaw, "*A Never-Ending Commitment": The High Cost of Preserving Vulnerable Beaches*, PROPUBLICA (Sept. 27, 2018), https://www.propublica.org/article/the-high-cost-of-preserving-vulnerable-beaches [https://perma.cc/V3GE-D9PR].

71. *Wildfire*, NAT'L ASS'N OF STATE FORESTERS, https://www.stateforesters.org/where-we-stand/wildfire/ [https://perma.cc/UQ8P-PTF2].

72. WILLIAM L. PAINTER, CONG. RSCH. SERV., R45484, DISASTER RELIEF FUND: OVERVIEW AND ISSUES (2020).

especially with government actions mandating lower rates or continuation of coverage.[73]

On the customer side regarding utility service, customers think that once they have service, they will always have service regardless of changing conditions or what they individually do. The duty to serve therefore protects property owners from poor decisions of which arguably they should have to bear the consequences, rather than having those costs pushed onto fellow ratepayers.

Quite simply, the current duty to serve presumes a level of stability that climate change undercuts—and we need to modify based on our new reality.[74] Changes in the duty to serve may also necessitate changes in how we determine prudency.

II. PRUDENCY

For investor-owned utilities, the driving reason to expand and continue service—including into places where it may actually not make sense—is to increase their rate base and in so doing increase

73. North Carolina mandates insurers write homeowners policies for the entire state at the same price, and therefore requiring inland homeowners to subsidize those living at the coast; an insurance company cannot write policies for only the noncoastal parts of the state, which would have lower rates. *See, e.g.*, MIKE CAUSEY, N.C. DEP'T OF INS., A CONSUMER'S GUIDE TO HOMEOWNER'S INSURANCE 18 (2010), https://files.nc.gov/doi/consumers-guide-to-homeowners-insurance.pdf [https://perma.cc/ R79J-LUHZ] ("If you try several insurers and cannot find coverage, you may obtain coverage through either the FAIR Plan or the Coastal Property Insurance Pool (formerly known as the Beach Plan). The North Carolina Joint Underwriting Association (NCJUA) is the administrator of the FAIR (Fair Access to Insurance Requirements) Plan. The Coastal Property Insurance Pool is administered by the North Carolina Insurance Underwriting Association (NCIUA). These plans are risk-pooling arrangements in which all companies selling property insurance in the state share the risk of property owners who have difficulty securing insurance from usual sources."); ELI LEHRER, JOHN LOCKE FOUND., NORTH CAROLINA'S BEACH PLAN: WHO PAYS FOR COASTAL PROPERTY INSURANCE? 4 (2008), https://www.johnlocke.org/wp-content/uploads/2016/06/beach_plan_reform.pdf [https://perma.cc/4N5E-RCRC] ("Many coastal North Carolina residents do not pay sufficiently high rates. In the long run, they must pay more for insurance while many of those inland should pay less."); *see also* Press Release, Cal. Dep't of Ins., Insurance Commissioner Lara Protects More Than 2 Million Policyholders Affected by Wildfires from Policy Non-Renewal for One Year (Nov. 5, 2020), https://www.insurance.ca.gov/0400-news/0100-press-releases/2020/release113-2020.cfm [https://perma.cc/P5MZ-C7EJ] (discussing California's decision to require the re-issuance of all policies, even where insurance companies would not have issued policies due to recent wildfire activity); Kathleen Pender, *Wildfires Make it Harder for California Homeowners to Get Insurance*, S.F. CHRON. (Apr. 20, 2019, 7:16 AM), https://www.sfchronicle.com/business/networth/article/Wildfires-make-it-harder-for-California-13781879.php [https://perma.cc/Q5GJ-PH9N] (discussing how California homeowners were turning to Lloyd's of London and other nontraditional insurers after wildfires).

74. *See* Victor B. Flatt, *Unsettled: How Climate Change Challenges a Foundation of Our Legal System, and Adapting the Legal State*, 5 BYU L. REV. 1397 (2016).

profit to shareholders. Investor-owned utilities make money by investing capital into the business. That capital pays for the infrastructure needed to provide utility service—plants, poles, wires, piping, and pumps. Ratepayers must pay for the use of this capital with the addition of a rate of return—a profit that is added based on the amount of capital.[75] The current average rate of return is right around ten percent nationwide for investor-owned utilities.[76] Investors only get this profit on capital put into the business, which leads to an incentive on the part of the utility to overinvest in capital infrastructure.[77]

Utilities do not receive a profit on operations and maintenance ("O&M") expenses—things like salaries and benefits and consumables like fuel. These costs are passed on to ratepayers without the additional rate of return adder. This also drives specific utility behavior—investor-owned utilities will push to have expenditures categorized as capital rather than O&M and will try to find solutions which they can capitalize when, in other businesses—even non-investor-owned utilities—those solutions would be considered less than ideal but better solutions would be categorized as expenses rather than categorized as capital.[78]

While capital investments generally are included in utility rate base and investors earn a return on those investments, there is one

75. *See* Fessler & Morelli, *supra* note 3, at 564–65 ("The classical approach to meeting this obligation was to secure Commission permission to build generation facilities in anticipation of future demand occasioned by the rising incidence of demand in an expanding population. The capital needed for these projects was raised in a combination of equity and debt financing. Once the facility was completed and operational, it was deemed 'used and useful.' At that juncture the project was reviewed for prudency as a final step to adding the cost to the utility's rate base. In order to prevent rate shock to consumers, the capital investment in the utility infrastructure was amortized for lengthy periods, typically thirty or more years. During this period of time the rates would reflect the risk-adjusted time cost of this money in a component known as the cost of capital.").

76. *See* Heather Payne, *Private (Utility) Regulators*, 50 ENV'T L. 999, 1025 (2021).

77. Rossi, *supra* note 11, at 396 ("[I]t is commonly recognized that many firms in the electric power industry over-invested in certain types of capital, such as power generation.").

78. Software as a service is a great example of this, especially around customer-facing systems. While nonutility businesses and some municipal utilities or electric cooperatives are most interested in ensuring the best customer experience, investor-owned utilities are more interested in ensuring their profit. So other businesses are led to adopt customer solutions from vendors with expertise in customer experience that will continuously update (and upgrade) the customer portal, data analytics, customer segmentation, etc. Investor-owned utilities have long recognized that they cannot make a profit on software-as-a-service—it's considered an expense. So instead of purchasing a product which is best-in-class, they create their own customer systems, which—since they are created only for that particular utility and are designed to last more than five years, can be capitalized. This leads to degraded functionality and poor customer experience over time, as customer systems designed more than twenty years ago are still commonplace in the industry.

caveat: typically only prudent investments can be included and will be approved by regulators.[79] The concept of prudency—that utility expenditures have been made per plan "according to sound management practices, and at a reasonable cost and with reasonable care"[80]—is what allows regulators to deny recovery of capital spent.[81] If spending is imprudent, then it cannot be recovered from ratepayers.

A. *How Prudency Is Determined*

It is well settled that prudence is not universally defined—neither prudent investments nor prudent costs.[82] Prudent investment theory, first suggested by the Public Service Commission in Massachusetts in 1914,[83] then by Justice Brandeis in 1923[84] and adopted by the Supreme Court of the United States in 1944,[85] has been widely used by regulators to approve or disallow rate recovery of utility capital spending ever since.[86] "The regulatory authority approves the utility's investment projects through prudency

79. Fessler & Morelli, *supra* note 3, at 555 ("Once completed, the project was reviewed by the agency under a prudency standard and, unless disallowed, the cost of the infrastructure improvement or addition was included in the base upon which shareholders were permitted to earn a reasonable return. In an effort to protect consumers from rate shock, the capital investments are amortized over several decades as the capital component in the agency's periodic redetermination of tariffs to be offered to various classes of ratepayers.").

80. LAZAR, *supra* note 20, at 31.

81. *See* Petition of Aquarion Water Company of Massachusetts, Inc., 2012 Mass. PUC LEXIS 25, 28 (Mass. D.P.U. Mar. 30, 2012) [hereinafter Petition] ("For costs to be included in rate base the expenditures must be prudently incurred and the resulting plant must be used and useful to ratepayers. The prudence test determines whether cost recovery is allowed at all, which the used and useful analysis determines the portion of prudently incurred costs on which the utility is entitled to a return." (internal citations omitted)).

82. *See* Promoting Wholesale Competition Through Open Access Non-Discriminatory Transmission Services by Public Utilities; Recovery of Stranded Costs by Public Utilities and Transmitting Utilities, 61 Fed. Reg. 21,540, 21,664 (May 10, 1996) (to be codified at 18 C.F.R. pts. 35, 385) ("Prudence of costs, depending upon the facts in a specific case, may include different things: e.g., prudence in operation and maintenance of a plant; prudence in continuing to own a plant when cheaper alternatives become available; prudence in entering into purchased power contracts, or continuing such contracts when buy-outs or buydowns of the contracts would result in savings.").

83. BURNS ET AL., *supra* note 17, at iv.

84. *See* Missouri *ex rel.* Sw. Bell Tel. Co. v. Pub. Serv. Comm'n, 262 U.S. 276, 308–09 (1923) (Brandeis, J., dissenting).

85. *See* Fed. Power Comm'n v. Hope Nat. Gas Co., 320 U.S. 591, 605–06 (1944); *see also* Charles W. Smith, *Prudent Investment Theory in Public Utility Rate Making*, 21 ACCT. REV. 288, 291–94 (1946) (discussing the shifting of the Supreme Court between 1923 and 1944).

86. *See, e.g.*, Albert L. Dietz, Jr., *Public Utilities—Rate Making—Prudent Investment Theory— Non Utility Functions*, 13 LA. L. REV. 617, 618 (1953) (discussing how the prudent investment theory was adopted by the Louisiana Public Service Commission in 1946).

reviews and used-and-useful hearings."[87] Although its use by commissions has waxed and waned through the decades and seemingly increases when there is discontent with utility actions,[88] "[c]ourts have defined prudence circularly,"[89] never describing a consistent test to determine prudency.[90]

Unfortunately for ratepayers, though, prudency is more often assumed rather than truly investigated.[91] Any prudency inquiry is rarely a thorough one;[92] rather, it is just the "final step" to include capital expenditures into the utility's rate base.[93] For example, in one of the cases where prudency might have been in question—the take-or-pay contracts which natural gas pipelines entered into and then found themselves with too much natural gas due to changes in the market—the Federal Energy Regulatory Commission

87. Sidak & Spulber, *supra* note, 16 at 907. It is well accepted in the literature that prudence typically goes along with some other test, such as the used-and-useful test. *See, e.g.*, BURNS ET AL., *supra* note 17, at v ("Review of recent state commission prudence inquiries involving electric and gas utilities reveals that in only a few cases do commissions rely clearly and solely on the concept of prudence for reaching a judgment. Rather, in most cases commissions also reference the used-and-useful test or some other test when deciding if questionable costs should be included in rates."). It has also been noted that there is a need for clarity in "the relationship of the prudence standard to the used-and-useful standard." *Id.* at vii.

88. BURNS ET AL., *supra* note 17, at iii ("Prudence is an old regulatory concept being put to new use. The frequency of use of the concept by state utility regulatory commissions has increased greatly in the last 10 years.").

89. Hempling, *supra* note 14.

90. *See* BURNS ET AL., *supra* note 17, at iii. The best scholars have been able to do is suggesting "guidelines for successful use" which include: (1) a presumption that utility investments are prudent; (2) to use a standard of reasonableness; (3) not to use hindsight or allow second guessing; and (4) to use a retrospective, factual inquiry. It is left for the reader to determine whether these are straightforward or their application would also be considered circular.

91. *See, e.g.*, William Boyd & Ann E. Carlson, *Accidents of Federalism: Ratemaking and Policy Innovation in Public Utility Law*, 63 UCLA L. REV. 810, 859 (2016) (discussing ex ante prudency reviews for proposed investments).

92. There are, of course exceptions. *See, e.g.*, Arturo Gándara, *Contracts in Wonderland: A Fable Regarding the Administrative Adjudication of Qualifying Facility Contracts in California*, 31 SAN DIEGO L. REV. 307, 445 (1994) ("[T]he CPUC has, at most, rattled sabers by disallowing major fuel expenses, launching major prudency reviews, and finding major fuel contracts by one utility imprudent, which led the others to breach their contracts. Those that breached their contracts were reimbursed for litigation and settlement costs since those decisions were considered prudent."). This may be changing, but it is far too early to say there is a trend. *See* Bryan Jacob, *South Carolina PSC Courageously REJECTS Dominion IRP*, S. ALL. FOR CLEAN ENERGY (Dec. 16, 2020), https://cleanenergy.org/blog/dominion-irp-rejected/ [https://perma.cc/G889-NGCX] (discussing South Carolina PSC's rejection of Dominion's proposed integrated resource plan, finding "too many deficiencies to satisfy the Commission that the proposed plan was indeed the most reasonable and prudent."); *see also* PACIFICORP, Request for a General Rate Revision, 2020 Ore. PUC LEXIS 704 (Or. P.U.C. Dec. 18, 2020) (Oregon PUC disallowing recovery for scrubbers at coal plant, finding decision to move forward in error).

93. Fessler & Morelli, *supra* note 3, at 564–65.

specifically did not hold prudency hearings to "decide how much pipelines were to 'blame' for buying gas that they could not resell without government help."[94] Instead, the Commission allowed the pipelines to recover most of their costs from captive consumers rather than determining each pipeline's imprudence in planning or foresight.[95]

For climate change and its impacts, perhaps the most important aspect of prudence is knowledge. The Massachusetts Department of Public Utilities explained the importance of knowledge to its prudence review process:

> A prudence review involves a determination of whether the utility's actions, based on all that the utility knew or should have known at that time, were reasonable and prudent in light of the extant circumstances. . . . A prudence review must be based on how a reasonable company would have responded to the particular circumstances and whether the company's actions were in fact prudent in light of all circumstances that were known, or reasonably should have been known, at the time a decision was made.[96]

At this point, scientists have told us far more about climate change than what utilities are taking action based upon. Utilities should be tasked with that knowledge. While the question of "who suffers the consequences of an error—utility customers or utility investors?"[97] has been one public utility commissions have always had to answer, we should not be rewarding profit-making enterprises with captive customers for sticking their heads in the proverbial sand.[98]

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94. John Burritt McArthur, *The Irreconcilable Differences Between FERC's Natural Gas and Electricity Stranded Cost Treatments*, 46 BUFF. L. REV. 71, 78 (1998).

95. *Id.* ("In formulating the proposed policy, the Commission consciously sought to avoid, to the extent possible, lengthy and potentially complex hearings involving an attempt to quantify and ascribe blame for the accumulation of pipeline take-or-pay liabilities. In the Commission's judgment, the principal objective should be to design and implement procedures to deal quickly, effectively, and positively with the take-or-pay problem. To this end, the Commission proposed a rebuttable presumption that a pipeline's agreement to assume an equitable share of take-or-pay costs would be sufficient to take account of any imprudence on the part of that pipeline in incurring take-or-pay liability."); *see also* EISEN ET AL., *supra* note 34, at 595 (discussing how many groups shared in the TOP transition costs, FERC allowed pipelines to pass costs on to customers, who "then sought to recoup these costs from their end-use customers in retail rates regulated by the state PUC. The state courts were called upon to police the rate formulas that the PUCs designed to allow their LDCs to recover the costs . . . .").

96. Petition, *supra* note 81, at 29.

97. BURNS ET AL., *supra* note 17, at vi.

98. *See*, Leslie Glustrom, *Privatizing the Risks and Not Just the Profits: How to TRULY Retire Coal Plants and Fossil Fuel Assets Early AND More Equitably*, CLEAN ENERGY ACTION: CITIZEN POWER, (Jan. 13, 2021), https://www.cleanenergyaction.org/blog/privatizi

B. *Changing Prudency for Climate Change*

If we take it to heart that prudent investments in infrastructure should take climate change into account, that will lead to many questions around utility decision-making. This is true even if prudence is assessed as it has been in the past—where "many regulators choose not to hold utilities responsible for risks affecting the electric industry as a whole[,]" but rather "hold utilities harmless, except for the consequences of decisions that were unreasonable at the time they were made."[99] Are plants sited in such a place that climate change will not impact them negatively and therefore not lead to additional modifications for storm barriers, flood walls, and additional cooling needs due to drought or higher surface temperatures, among other potential issues? If plants are not adequately addressing potential climate change impacts, any capital investment in those plants may be imprudent, as the plants may need to shut down earlier than anticipated or may be unable to produce electricity when needed. Are decisions around main replacements taking into account that we will need to cease all natural gas use in the not too distant future?[100] If not, then that capital spending may be imprudent. Are transmission lines being put in areas where, due to the impacts from climate change, it will be impossible for them to operate safely? Utility management has substantial control over these decisions and the actions taken (or not taken) in response to them. Regulators will have to address these questions—and many, many more—as they assess the prudence of utility investment going forward.

The impact of a finding of "not prudent" on utility infrastructure could be significant for utility investors. "Indeed, prudency disallowances generally are interpreted as stricter regulation—a tightening of controls on the regulated utility."[101] But I argue that a prudence determination in the face of climate change must be both more granular and more encompassing. Letting utilities recoup poor investments because the entire industry is facing the impacts

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ng-the-risks [https://perma.cc/GSA9-5EGW] (arguing that "utilities should bear some accountability for their stranded assets and that future generations of utility customers should not be responsible" for poor past utility decisions); *see also* Jess Del Fiacco, *Should Big Utilities Pay for Their Bad Choices?*, INST. FOR LOC. SELF-RELIANCE, (Jan. 7, 2021), https://ilsr.org/securitization-coal-plants-episode117/ [https://perma.cc/Q86F-EUS4].

99. BURNS ET AL., *supra* note 17, at vi.

100. *See* Heather Payne, *The Natural Gas Paradox: Shutting Down a System Designed to Operate Forever*, 80 MD. L. REV. 693 (2021).

101. Sidak & Spulber, *supra* note 16, at 983.

from climate change is simply unacceptable. Like other recent innovations in utility regulation, prudency must be channeled "in new directions."[102]

One of the biggest reasons that utilities will be spending money—both that can be capitalized and that will be passed through as operations and maintenance expenses—is for what could broadly be termed natural disaster restoration: those activities that exist in the hours, days, or weeks after a large hurricane, nor'easter, flood, or wildfire passes through an area.[103] During these times and when the bills come due for those costs to be passed to the ratepayers, utilities (or their regulators) infrequently—if ever—question the prudency of the money that is being spent.[104] We have always assumed that the most important thing to do is get everyone utility service again.[105] So, we have always considered reconnecting a current customer after a natural disaster prudent.

The question is whether, with all the impacts of a changing climate, we should automatically assume that reconnecting every customer in a utility's service territory is prudent.[106] I argue that

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102. Boyd, *supra* note 10, at 1660.

103. *See* BRADLEY W. JOHNSON, EDISON ELEC. INST., AFTER THE DISASTER: UTILITY REPLACEMENT COST RECOVERY v (2005), https://www.efis.psc.mo.gov/mpsc/commoncomponents/viewdocument.asp?DocId=4048185 [https://perma.cc/W42W-SX8K]; *see also* Sarah Brody, Matt Rogers, & Giulia Siccardo, *Why, and How, Utilities Should Start to Manage Climate-Change Risk*, MCKINSEY & CO. (Apr. 24, 2019), https://www.mckinsey.com/industries/electric-power-and-natural-gas/our-insights/why-and-how-utilities-should-start-to-manage-climate-change-risk# [https://perma.cc/NVD3-WD2G] ("[A] typical utility saw $1.4 billion in storm-damage costs and lost revenues due to outages caused by storms over a 20-year period. . . . [W]e estimated that by 2050, the cost of damages and lost revenues would rise by 23 percent ($300 million) . . . . Combined, these estimates give us a baseline: $1.7 billion in economic damage for each utility by 2050.").

104. *See* AM. PUB. POWER ASS'N, RESTORATION BEST PRACTICES GUIDEBOOK 35–37 (2018), https://www.publicpower.org/system/files/documents/Restoration_Best_Practices_Guidebook_2018.pdf [https://perma.cc/5N67-5GP6] (noting that some costs are reimbursable by FEMA, at least for public power agencies).

105. *See*, *e.g.*, Kent Davidson, *The Importance of Utility Preparation and Response to Natural Disasters*, WESCO INT'L (Mar. 4, 2019), https://blog.wesco.com/utility-response-to-natural-disasters [https://perma.cc/T8N5-854S].

106. Regulators should also consider that increasing utility bills—especially if the duty to serve remains unmodified—will be stressing individual economic security at the same time that governments—and, therefore, taxpayers—are seeing increased spending from disaster recovery needs, including (unless modified significantly) continuing to subsidize flood insurance and potentially another mortgage crisis. *See generally* Michael Pappas & Victor B. Flatt, *Climate Changes Property: Disasters, Decommodification, and Retreat*, 82 OHIO ST. L.J. 331 (2021) (including suggestions for the flood insurance program). *See also* Zack Colman & Katie O'Donnell, *Borrowed Time: Climate Change Threatens U.S. Mortgage Market*, POLITICO (June 8, 2020), https://www.politico.com/news/2020/06/08/borrowed-time-climate-changemortgage-market-304130 [https://perma.cc/8NV9-AGU4] (discussing the issues facing the housing market because of climate change).

we should not; there are going to be situations where the socialized cost of service is simply too high, and the certainty around further climate impacts too certain. The challenge is that the utility, at this point in time, does not have the ability to determine that spending that money would be imprudent; if a customer is within their geographic service territory, they have a duty to serve that customer.[107] So, if we want prudent decisions around service going forward, the utility needs the ability to stop serving that customer. Regulators can give utilities more certainty that the money they are spending will be considered prudently spent by determining sooner when that socialized cost of service is too high based on climate impacts.[108] We can only get to that point by modifying the duty to serve. Without modification, utilities will simply argue that existing obligations require them to restore service in all circumstances in which it can be safely done—and that addressing existing obligations is prudent. Without modifying the duty to serve, that restoration is prudent because utility management has no "substantial control" whether or not to do it; they must.[109] It is therefore clear that utilities would think that "the prudency of such action should be relatively easy to defend."[110]

These questions, of course, focus on capital that is currently being spent. There is a corresponding issue which also needs to be addressed: at what point, if ever, should capital that was spent earlier and deemed prudently invested in an earlier rate case now be found imprudent and remaining recovery of those funds disallowed? Scholars have advocated against re-opening prudency determinations, arguing that such a review would be economically inefficient with high transaction costs, open to retroactive justifications, and potentially lead investors to require risk premiums to hedge against other investments being found imprudent in the future.[111] However, even with those potential costs, re-opening prudency determinations may be necessary.

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107. *See* discussion *supra* section I.A.

108. Sidak & Spulber, *supra* note 16, at 986 ("If regulators pursue predictable policies and if investors do not anticipate fluctuations in earnings caused by disallowances of capital expenditures through prudency reviews, endogenous risk is minimized.").

109. BURNS ET AL., *supra* note 17, at vi (discussing how regulators use the prudence test "to hold utilities responsible for the risks over which management has substantial control").

110. MATLOCK, *supra* note 18.

111. *See* J. Gregory Sidak & Daniel F. Spulber, *Givings, Takings, and the Fallacy of Forward-Looking Costs*, 72 N.Y.U. L. REV. 1068, 1135–39 (1997); *see also* Sidak & Spulber, *supra* note 16, at 925–26 (discussing reopening of past prudency reviews).

III. LEARNING FROM OTHER AREAS OF THE LAW

As regulators consider changes to the duty to serve, two other instances, where costs were broadly socialized, may prove instructive. In both cases, the examples show how continued socialization of risk has driven continued risky—and perhaps even prompted riskier—behavior.

A. *NFIP Repetitive Loss Properties*

As Professor Christine Klein, one of the foremost scholars on the National Flood Insurance Program ("NFIP"), summarizes:

> [T]he NFIP was never intended as a permanent federal subsidy for flood-prone properties along rivers and coastlines abandoned as commercially unviable by the private insurance industry. Instead, Congress provided flood insurance at below-cost rates as only an interim solution until state and local governments enacted permanent self-help land-use regulations that would restrict development in risky areas. By encouraging local governments to enact floodplain regulations, Congress intended to shift the costs of development in known flood areas back to those who chose to occupy them, thereby sending a strong signal of danger. But despite its lofty goals, the NFIP has failed miserably: it was more than twenty billion dollars in debt to the U.S. treasury as it turned fifty. At the same time, the nation continues to build in floodplains and to suffer death and devastating property loss from recurrent floods.[112]

One of the issues with the NFIP is that of "repetitive loss" properties—where "a small number of high-risk properties take up a disproportionately large proportion of insurance payouts."[113] Technically defined as "any insurable building for which two or more claims of more than $1,000 were paid by the National Flood Insurance Program (NFIP) within any rolling ten-year period, since 1978," there are more than 122,000 of them nationwide.[114] They collectively are "the biggest draw" on the NFIP, with "almost $3.5 billion" in claims paid to repetitive loss property owners.[115] Additionally, there are more than 6000 properties where the

112. Christine Klein, *The National Flood Insurance Program at Fifty: How the Fifth Amendment Takings Doctrine Skews Federal Flood Policy*, 31 GEO. ENV'T L. REV. 285, 285 (2019).

113. *Id.* at 333.

114. *National Flood Insurance Program: Frequently Asked Questions: Repetitive Loss*, FEMA, https://www.fema.gov/txt/rebuild/repetitive_loss_faqs.txt [https://perma.cc/2AW7-Y89K].

115. *Id.*

cumulative amount that has been paid exceeds the value of the property.[116] However, simply being a repetitive flood property does not impact your flood insurance premium; that property will pay the same amount for flood insurance as a property that has a much lower risk level.[117] Severe repetitive loss properties socialize risk even more—these are properties that "receive four or more payments from separate flood events or two payments each worth more than the total value of the property."[118] In one county, Passaic, New Jersey, $170 million has been paid out in insurance claims to 810 properties.[119]

The duty to serve today basically allows the equivalent of repetitive loss properties under the NFIP. Part of the challenge—which also was the case of severe repetitive loss properties for many years—is that we do not know with certainty which properties are costing more to serve, or to what extent properties may be impacted in the future. Thankfully for federal taxpayers who are currently backstopping the NFIP, that work has been done; a tracking tool now exists that maps severe repetitive loss properties.[120] The challenge is that it is completely backward facing—and modifications to both prongs of the duty to serve will require taking future projections of climate risk into account to accurately minimize socialization of the costs of the utility equivalent of severe repetitive loss properties.

B. *Nuclear Disasters / The Price-Anderson Act*

The Price-Anderson Act was passed initially due to a lack of data.[121] Since insurers did not know what they might be looking at

116. *Id.*

117. *Id.* ("Flood insurance premiums will not increase merely because a property is on the RL list.").

118. Leslie Kaufman, *Tracking Tool Spotlights Repetitive Flood Loss Homes Receiving U.S. Taxpayer Funds*, INS. J. (Sept. 15, 2020), https://www.insurancejournal.com/news/national/2020/09/15/582713.htm [https://perma.cc/K9VG-NTH2].

119. *Id.* That translates to more than $209,000 per property; the average home price in Passaic County in January 2020 was $363,000, but has been as low as $286,000 in January 2013. *See Passaic County Home Values*, https://www.zillow.com/passaic-county-nj/home-values/ [https://perma.cc/QQ5W-ZZGV]. Therefore, it is likely that the $209,000 per home has far surpassed the value of the properties to which it has been paid since the NFIP came into existence in 1968.

120. Kaufman, *supra* note 118.

121. Anthony F. Earley Jr., *Price-Anderson Act Under Attack*, 53 NOTRE DAME LAW. 954, 954– 55 (1978) ("By 1956 the first reactor facility was within one year of being operational. At this point serious questions arose about the availability of liability insurance for the various nuclear projects then under way or in the planning stages. The problem encountered

in the case of a nuclear disaster when the industry was first developing, Congress passed a limited liability scheme to encourage the development of the industry.[122] Despite decades of data that now would enable the insurance industry to adequately value the actuarial risk of a nuclear disaster, the Act has been extended multiple times, currently set to expire again in 2025 (with, no doubt, a heavy lobbying effort that will attempt to garner a further extension).[123] The Act provides that a nuclear plant is only required to keep a (minimal) insurance policy. The entire civilian nuclear fleet would chip in with secondary insurance if a disaster totaled up to around $12 billion.[124] Anything more—and everything over that $12 billion—is paid for by the U.S. taxpayer.[125]

This risk socialization is significant; the Japanese government has raised the cost of the Fukushima disaster to $202.5 billion, although private estimates expect the cost to be between $470 and $660 billion.[126] One could also conclude that, because the risk—especially from climate change impacts like sea level rise, higher storm surges, and more extreme hurricanes—around plants is socialized, nuclear plant operators are not adequately addressing the

was the lack of any available data on the risks involved in nuclear power. Individual and commercial liability policies excluded losses caused by nuclear contamination because of insurers' inability to determine the potential losses.").

122. DEP'T OF ENERGY, REPORT TO CONGRESS ON THE PRICE-ANDERSON ACT 1 (1999), https://www.energy.gov/sites/prod/files/gcprod/documents/paa-rep.pdf [https://perma.cc/6FV4-EEZ6] ("In 1957, Congress enacted the Price-Anderson Act as an amendment to the Atomic Energy Act of 1954 to encourage the development of the nuclear industry and to ensure prompt and equitable compensation in the event of a nuclear incident. Specifically, the Price-Anderson Act established a system of financial protection for persons who may be liable for and persons who may be injured by a nuclear incident . . . . Private insurance is most likely not available for many DOE activities. Even when available, it would be extremely expensive, limited, and restricted.").

123. *See* MARK HOLT, CONG. RSCH. SERV., IF10821, PRICE-ANDERSON ACT: NUCLEAR POWER INDUSTRY LIABILITY LIMITS AND COMPENSATION TO THE PUBLIC AFTER RADIOACTIVE RELEASES (2018) ("Price-Anderson's authority for NRC to indemnify additional reactors periodically expires and has been extended four times, most recently through 2025 by the Energy Policy Act of 2005 (P.L. 109-58)."), https://www.everycrsreport.com/files/2018-02-05_IF10821_d366bd897fe1f7e7517c1d9094eaf9a8890fbc4f.pdf [https://perma.cc/CF6L-ZFVR].

124. *Id.*

125. *Id.*

126. Tim Hornyak, *Clearing the Radioactive Rubble Heap that was Fukushima Daiichi, 7 Years On*, SCI. AM. (Mar. 9, 2018), https://www.scientificamerican.com/article/clearing-the-radioactive-rubble-heap-that-was-fukushima-daiichi-7-years-on/#:~:text=In%202016%20the%20government%20increased,billion%20to%20%24660%20billion%2C%20however [https://perma.cc/LX7N-2XVG].

potential of those impacts on their operations, downplaying them in regulatory filings and public statements.[127]

Similar to both expansion and continuation under the duty to serve, costs are socialized in both severe repetitive loss properties under the NFIP and potential nuclear incidents covered by the Price Anderson Act, rather than internalized, even though the costs can now be quantified in all three situations. Legislators and regulators should determine whether socialization—and perhaps additional risk-taking by those benefiting from the decreased risk that socialization provides—should continue.

IV. A NEW PARADIGM—MODIFYING THE DUTY TO SERVE

Based on the examples of failed socialization of costs and to guard against moral hazard, the duty to serve should be modified. Modifying the duty to serve will have different impacts based on which prong is being modified, and the implications are different for utilities, for regulators, and for property owners. If the expansion prong of the duty to serve is the one being modified, it is relatively easier to understand the general situation: with a modified duty to serve, that particular utility service will simply not be available in that area going forward. Since it was not there previously, there are no current uses (or users). If the continuation prong of the duty to serve is the one being modified, then current, existing customers of that utility service will no longer have access to that service, depending on the rules and procedures set out either in legislation or by regulation. Especially for regulators and property owners, which utility service is being impacted will also have specific ramifications.

A. *Implications For Utilities*

This part will focus first on utilities, looking at specific ways climate change will impact electric, gas, water, and sewer utilities, current utility business models and how those climate impacts will

127. *See, e.g.*, Mario Alejandro Ariza & Kate Stein, *Calm Before the Storm: How the American Nuclear Industry Downplays the Threat of Climate-Induced Flooding*, THE NEW REPUBLIC (Sept. 30, 2019), https://newrepublic.com/article/154942/america-nuclear-power-plants-climate-change-risk-fukushima [https://perma.cc/9ZY8-F4US]; Caroline Reiser, *With Climate Change, Aging Nuclear Plants Need Closer Scrutiny. Turkey Point Shows Why.*, BULL. OF THE ATOMIC SCIENTISTS (Sept. 14, 2020), https://thebulletin.org/2020/09/with-climate-change-aging-nuclear-plants-need-closer-scrutiny-turkey-point-shows-why [https://perma.cc/U2X3-TRGB].

drive utility behavior, and how a modified duty to serve may alter that corporate behavior. Different public utilities will be impacted by climate change in different ways. Let us look at each in turn.

Electrical utilities are already seeing major impacts from climate change. The fires that have burned in successive years on the West Coast were, in some cases, sparked by utility equipment.[128] While deferred maintenance may have led to the specific failures, increasing temperatures and drought caused by climate change certainly led to increased fuel loads and the conditions which allowed the fires to spread rapidly.[129] Electric utilities will also be faced with increased storm response costs, as storms become both stronger due to higher ocean temperatures and larger, impacting wider geographic scope and therefore decreasing the ability to rely for help on mutual aid agreements.[130] Heat events—both hotter and longer in duration—will stress infrastructure and lead to increased failures.[131]

For areas of the country with vertically-integrated utilities, those utilities will also need to address the risks to specific generation facilities.[132] Nuclear plants, for example, face the potential of

128. *See, e.g.*, 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), https://www.wsj.com/articles/pg-e-knew-for-years-its-lines-could-spark-wildfires-and-didnt-fix-them-11562768885 [https://perma.cc/4F2T-MWPG].

129. Anne C. Mulkern, *Wildfire Season is Coming. Is the New PG&E Ready?*, E&E NEWS (July 1, 2020, 6:53 AM), https://www.eenews.net/stories/1063482919 [https://perma.cc/P254-F7BF]; Pippa Stevens, *Utilities are Struggling to Keep the Lights On as Fires, Drought Plague California*, CNBC (Aug. 1, 2021), https://www.cnbc.com/2021/08/01/utilities-are-struggling-to-keep-the-lights-on-as-fires-drought-plague-california.html [https://perma.cc/ENY8-MHTU].

130. *See* Justin Auciello, *N.J. Utility Company Seeks 8.5 Percent Rate Increase to Recoup Storm Damage Costs, Support Enhancements*, WHYY (Feb. 19, 2020), https://whyy.org/articles/n-j-utility-company-seeks-8-5-percent-rate-increase-to-recoup-storm-damage-costs-support-enhancements/ [https://perma.cc/DF2L-V3X5] (discussing increased storm response costs); Stephanie Osmanski, *Are Hurricanes Actually Getting Stronger? Scientists Think So*, GREEN MATTERS (Dec. 1, 2020, 4:02 PM), https://www.greenmatters.com/p/are-hurricanes-getting-stronger#:~:text=Hurricanes%20are%20becoming%20more%20frequent,includes%20tropical%20storms%20and%20hurricanes [https://perma.cc/8X8A-43HB] (discussing stronger storms); Jeff Platsky, *Who Pays for Utility Repairs from Storm Damages? You Do*, PRESS CONNECTS (Mar. 10, 2018, 4:35 PM), https://www.pressconnects.com/story/news/local/2018/03/09/who-pays-utility-repairs-storm-damage-you-do-through-higher-ny-nyseg-rates/399191002/ [https://perma.cc/J28P-GBAD] (discussing impact on mutual aid).

131. NANAVATI ET AL., *supra* note 11, at 13–15.

132. Vertically integrated utilities are often tasked with reliability responsibilities, in addition to the duty to serve. *See* Amy L. Stein, *Distributed Reliability*, 87 U. COLO. L. REV. 887, 902–03 (2016) ("Imposing a duty to serve on electric utilities made sense for practical reasons as well. For a hundred years, reliability of the electric grid was handled primarily 'in house' by a vertically integrated utility. . . . The utility provided electricity for ratepayers within a state-defined service territory, owning the assets that provided these services and

premature closure from changing climactic conditions which require large capital investments such as for new cooling water systems to deal with higher surface temperatures, better flood barriers, and coping with inundation from storms which are slow-moving and bring higher rainfall totals than have previously been experienced.[133] Rising sea levels could also pose problems for spent fuel storage facilities, often located at or close to sea level, until a national nuclear waste repository is actually completed.[134]

The issues with water temperatures impact all generation facilities that use the steam cycle to generate electricity—nuclear, but also coal-fired, natural gas combined cycle units, and some concentrating solar power designs.[135] Drought, more likely in parts of the United States due to climate change, will also require these facilities to reduce the amount of electricity they are generating due to

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obtaining rate-based compensation for them. These utilities functioned under a regulated cost of service model where their investments in generation, transmission, and distribution facilities were judged by state public utility commissions (PUCs) for their prudence, with corresponding rate increases for qualifying investments. Utilities would make a determination about what assets were necessary for the grid based in part on reliability considerations, and their job was made easier by the centralized ownership and control of all the assets.").

133. *See, e.g.*, Matthew Bandyk, *For Nuclear Plants Operating on Thin Margins, Growing Climate Risks Prompt Tough Choices*, UTIL. DIVE (Sept. 10, 2020), https://www.utilitydive.com/news/for-nuclear-plants-operating-on-thin-margins-growing-climate-risks-prompt/584883/?utm_source=Sailthru&utm_medium=email&utm_campaign=Newsletter%20Weekly%20Roundup:%20Utility%20Dive:%20Daily%20Dive%2009-12-2020&utm_term=Utility%20Dive%20Weekender [https://perma.cc/X8N9-75FB]; Christopher Flavelle & Jeremy C.F. Lin, *U.S. Nuclear Power Plants Weren't Built for Climate Change*, BLOOMBERG BUSINESSWEEK (Apr. 18, 2019, 4:00 AM), https://www.bloomberg.com/graphics/2019-nuclear-power-plants-climate-change/ [https://perma.cc/2ZJK-BYN7].

134. Bandyk, *supra* note 133. Yucca Mountain, currently on hold, is not forecast to be operational until at least 2048, assuming construction would restart immediately. It is therefore unlikely that a national nuclear waste repository will be completed prior to mid-century. *See* Jeff McMahon, *U.S. Launches 35-Year Quest for a New Yucca Mountain*, FORBES (Jan. 17, 2013, 1:00 PM), https://www.forbes.com/sites/jeffmcmahon/2013/01/17/us-launches-35-year-quest-for-a-new-yucca-mountain/?sh=bd0041d97181 [https://perma.cc/HKK5-NUNX].

135. *See* Erin Meyer & Julie Wernau, *Power Plants Releasing Hotter Water*, CHI. TRIB. (Aug. 20, 2012), https://www.chicagotribune.com/news/ct-xpm-2012-08-20-ct-met-nuclear-water-20120820-story.html [https://perma.cc/YWJ3-A55G]; Robert Siegel, *Nuclear Plant May Be in Hot Water Over its Cooling System*, NAT'L PUB. RADIO (July 23, 2014, 4:08 PM), https://www.npr.org/2014/07/23/334494701/nuclear-plant-may-be-in-hot-water-over-its-cooling-system [https://perma.cc/DYE4-ALR9]; *Electricity Explained: Howe Electricity is Generated*, U.S. ENERGY INFO. ADMIN., https://www.eia.gov/energyexplained/electricity/how-electricity-is- generated.php [https://perma.cc/K48S-4WDT]; *see also* N. Madden, A. Lewis & M. Davis, *Thermal Effluent from the Power Sector: An Analysis of Once-Through Cooling System Impacts on Surface Water Temperature*, 8 ENV'T RES. LETTERS 1 (July 3, 2013), https://iopscience.iop.org/article/10.1088/1748-9326/8/3/035006 [https://perma.cc/7RND-V5EE] (noting that, even in 2005, power plant cooling discharges had a high enough water temperature to potentially impact aquatic life at more than half of the facilities studied).

a lack of available water.[136] Drought will also be an increasing problem for hydroelectric facilities.[137]

Gas utilities will likewise need to address increased risk. Increased rainfall and flooding could lead to erosion, which in turn increases the likelihood for leaks and ruptures.[138] Leaks make climate change worse by allowing methane to escape into the atmosphere.[139] Ruptures can cause explosions, leading to loss of life and significant property damage.[140] Sea level rise and coastal erosion will also lead to risks for transmission pipelines built close to shore.[141] Sea level rise and extreme storms will impact distribution pipelines, potentially rupturing when houses are impacted in extreme weather events.[142]

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136. Indeed, this is already happening. *See, e.g.*, Poulomi Ganguli, Devashish Kumar & Auroop R. Ganguly, *U.S. Power Production at Risk from Water Stress in a Changing Climate*, SCI. REP. 1, 8 (Apr. 18, 2018), https://www.nature.com/articles/s41598-017-12133-9 [https://perma.cc/254U-G5GH].

137. STAN. SCH. OF EARTH, ENERGY & ENV'T SCI., *Drought Boost Emissions as Hydropower Dries Up*, SCIENCEDAILY (Dec. 21, 2018), https://www.sciencedaily.com/releases/2018/12/181221123659.htm#:~:text=Summary%3A,new%20study%20quantifies%20the%20imp act [https://perma.cc/K3VC-VVLT].

138. *See* Erica Jackson, *Heavy Rains and Risks to Pipelines*, FRACTRACKER ALL. (Sept. 13, 2018), https://www.fractracker.org/2018/09/heavy-rains-risks-to-pipelines/ [https://perma.cc/2CSZ-3WZV].

139. *Infographic: The Climate Risks of Natural Gas*, UNION OF CONCERNED SCIENTISTS (Feb. 3, 2014), https://www.ucsusa.org/resources/climate-risks-natural-gas [https://perma.cc/W7DF-FWXV] ("Methane—a primary component of natural gas—leaks from drilling sites and pipelines. It is 34 times more potent than carbon dioxide at trapping heat. An estimated one to nine percent of all natural gas produced escapes into the atmosphere . . . .").

140. *See* Catherine Morehouse, *Enbridge Natural Gas Pipeline Explosion Kills 1, Injures 5 in Kentucky*, UTIL. DIVE (Aug. 2, 2019), https://www.utilitydive.com/news/enbridge-natural-gas-pipeline-explosion-kills-1-injures-5-in-kentucky/560126/ [https://perma.cc/6UT8-JU38]; *see also* Matt Kelso, *Pipelines Continue to Catch Fire and Explode*, FRACTRACKER ALL. (Feb. 21, 2020), https://www.fractracker.org/2020/02/pipelines-continue-to-catch-fire-and-explode/ [https://perma.cc/7REZ-9YRJ].

141. *See* U.S. DEP'T OF ENERGY, OFF. OF ELEC. DELIVERY & ENERGY RELIABILITY, EFFECT OF SEA LEVEL RISE ON ENERGY INFRASTRUCTURE IN FOUR MAJOR METROPOLITAN AREAS 1, 17–18, 20 (2014), https://www.energy.gov/sites/prod/files/2014/10/f18/DOE-OE_SLR%20Public%20Report_Final%20_2014-10-10.pdf [https://perma.cc/S48T-XTPF]; AUBREY JAHELKA, UNIV. OF PA., PIPELINE RESILIENCE AGAINST COASTAL EROSION IN LOUISIANA—A CASE STUDY (2017), https://issuu.com/aubreyjahelka/docs/enmg_502_-_louisiana_wetlands _case_ [https://perma.cc/U3A6-763Z].

142. *See, e.g.*, *Video Captures Home Explosion in N.J. After Flood Prompts Evacuation*, EYEWITNESS NEWS (Sept. 2, 2021), https://abc7ny.com/house-explosion-rahway-new-jersey-pseg/10993898/ [https://perma.cc/5E6Z-SPLR] (discussing how a home exploded due to natural gas leakage into the house during heavy flooding from Hurricane Ida); *Flood Possibly Caused Gas Leak Before Rahway, NJ Home Exploded, Police Say,* CBS NEW YORK (Sept. 2, 2021), https://newyork.cbslocal.com/2021/09/02/rahway-house-explosion/ [https://perma.cc/N8WV-VXUP] ("Rahway Police said the explosion remains under investigation, but it appears flooding caused a gas leak that led to the blast.").

Water and sewer utilities will also face increased risks.[143] With increasing temperatures, water utilities face impacts from larger (and potentially deadly) algae blooms, leading to increased treatment costs.[144] At a minimum, increased treatment is needed to address taste and odor concerns.[145] Droughts will make supply increasingly difficult to procure, potentially leading to the need for significant capital investments in direct or indirect reuse.[146] Increasing breaks from extreme weather and erosion will also stress the water utility distribution system.[147] Breaks not only lead to a decrease in available supply, but also can allow contaminants into the drinking water system, leading to orders to completely cease use of water from the system due to health concerns or boil orders.[148] Extreme rainfall events can also trigger emergency situations at reservoir dams, which could lead to catastrophic flooding and loss of life if dam safety protocols do not take increased variability and extreme conditions into account.[149]

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143. *See, e.g.*, Richard Luscombe, *Will Florida be Lost Forever to the Climate Crisis?,* THE GUARDIAN (Apr. 21, 2020), https://www.theguardian.com/environment/2020/apr/21/florida-climate-crisis-sea-level-habitat-loss [https://perma.cc/UQ8G-TVKB] (discussing water contamination and issues with sewers as sea level rises and other climate impacts that occur in Florida).

144. *See World Water Week: Climate Change and its Effect on Algal Blooms and Local Water Quality*, QUENCH (Aug. 24, 2020), https://quenchwater.com/blog/world-water-week-climate-change-and-its-effect-on-algal-blooms-and-local-water-quality/ [https://perma.cc/S6SU-XRLZ].

145. *See id.*

146. Implementing direct or indirect reuse will take enabling legislation or regulation in most states. There is also significant public opposition. *See* Heather Payne, *A Fix for a Thirsty World: Making Direct and Indirect Reuse Legally Possible*, 42 WM. & MARY ENV'T L. & POL'Y REV. 201, 205–06 (2017).

147. AM. WATER WORKS ASS'N & WATER ENV'T FED'N, INVESTMENT IN INFRASTRUCTURE TO SUPPORT CLIMATE CHANGE RESILIENCE: THE SOONER WE ACT, THE LOWER THE COST AND RISK, https://www.wef.org/globalassets/assets-wef/5---advocacy/water-week/climate-change-investment-fact-sheet_2017.pdf [https://perma.cc/C9D8-CKTY].

148. *See* C. Lin, Tim Wade, E. Hilborn, L. Engel & D. Richardson, *Hospital Visits for Gastrointestinal Illness After a Major Water Main Break in 2010*, INT'L SOC. OF ENV'T EPIDEMIOLOGY CONF., https://cfpub.epa.gov/si/si_public_record_report.cfm?Lab=NHEERL&dirEntryId=337907 [https://perma.cc/S6NE-RCZR] ("Water main breaks are becoming increasing common in the U.S. as our drinking water distribution systems age and soils shift in response to droughts and floods. Main breaks are an emergency as they disrupt normal operations and have potential health consequences due to contamination of drinking water supplies."); *see also* Michael Timm, *Water Main Breaks Expose Public to Waterborne Disease Risk*, CTR. FOR WATER POL'Y, SCH. OF FRESHWATER SCI., U. OF WIS.-MILWAUKEE, https://uwm.edu/centerforwaterpolicy/wp-content/uploads/sites/170/2016/11/Climate-Change-and-Disease_Water-main-breaks-expose-public-to-waterborne-disease-risk.pdf [https://perma.cc/XC4F-9WCX]; *Why do Water Utilities Issue Boil Water Orders?*, PORTLAND WATER DIST., https://www.pwd.org/faqs/why-do-water-utilities-issue-boil-water-orders [https://perma.cc/3V3T-AND8].

149. *See, e.g.*, Daisy Schadlich, *Dam Safety for Downstream Safety: Revisiting the Oroville Dam Spillway Failure*, AM. RIVERS (Mar. 4, 2020), https://www.americanrivers.org/

For sewer utilities, the main threats are health and environmental. With systems that have combined stormwater and sewer piping, extreme rainfall events will lead to increasing combined sewer overflows.[150] Even noncombined systems may have challenges with increased rainfall due to infiltration of sewer pipes.[151] Flooding can impact lift stations, leading to release of untreated sewage.[152] Erosion is also a concern, both for mains and at houses that are impacted by severe storms and sea-level rise.[153] A lack of electricity impacts both water and sewer utilities, although backup generators are often located at both water and wastewater treatment plants.[154] However, sewer pump stations or water intake pumps

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2020/03/dam-safety-for-downstream-safety-revisiting-the-oroville-dam-spillway-failure/ [https://perma.cc/W4HS-YSG6].

150. *See* Emma Edmund, *In Focus: As Climate Change Worsens, Combined Sewers Pose New Issues*, THE DAILY NW. (May 26, 2020), https://dailynorthwestern.com/2020/05/26/city/in-focus-as-climate-change-worsens-combined-sewers-pose-new-issues/#:~:text=According%20to%20CARP%2C%20scientific%20data,overwhelms%20the%20sewage%20treatment%20system [https://perma.cc/9MMN-VFH5]; Daniel Berti, *More Rainfall, A Consequence of Climate Change, Expected to Make Sewage Overflows Worse*, VA. MERCURY (Apr. 15, 2019), https://www.virginiamercury.com/2019/04/15/more-rainfall-a-consequence-of-climate-change-expected-to-make-sewage-overflows-worse/ [https://perma.cc/S23J-AWS3].

151. *Climate Impacts on Water Utilities*, U.S. ENV'T PROT. AGENCY, https:// www.epa.gov/arc-x/climate-impacts-water-utilities#storms [https://perma.cc/7CNV-HS6U] ("More extreme storm events will increase the amount of wet weather infiltration and inflow into sanitary and combined sewers.").

152. *See* James Hughes et al., *Impacts and Implications of Climate Change on Wastewater Systems: A New Zealand Perspective*, 31 CLIMATE RISK MGMT. 100262 (2021) https://www.sciencedirect.com/science/article/pii/S2212096320300528 [https://perma.cc/FM48-AUBY].

153. Andrea Riquier, *Climate Change Means Public Utilities Will Need Billions in Upgrades Over the Next Decade, Report Says*, MKT. WATCH (May 12, 2021, 6:05 AM), https://www.marketwatch.com/story/climate-change-means-water-and-sewer-utilities-will-need-billion-of-upgrades-over-the-next-decade-report-says-11620753790 [https://perma.cc/VD45-JLDT] (showing where climate changes will impact water and sewer utilities); *Climate Adaptation and Erosion & Sedimentation*, ENV'T PROT. AGENCY (May 26, 2021), https://www.epa.gov/arc-x/climate-adaptation-and-erosion-sedimentation [https://perma.cc/FAL6-BW3G] (more frequent storms and intense rain can increase erosion); *8 Warning Signs of Underground Pipe Damage After a Flood in Your Modesto Home*, BELL BROS., https://bellbroshvac.com/blog/8-warning-signs-underground-pipe-damage-after-flood-modesto/#:~:text=But%2C%20once%20the%20waters%20have,plumbing%20to%20crack%20and%20break [https://perma.cc/FT5R-VBHQ] ("What most homeowners don't realize, though, is that flooding can also cause your underground plumbing to crack and break.").

154. *See, e.g.*, William Atkinson, *Backup Generators for Water and Wastewater Utilities*, WATERWORLD (Oct. 6, 2015), https://www.waterworld.com/home/article/14069961/backup-generators-for-water-and-wastewater-utilities [https://perma.cc/5GJV-LFF3] (discussing generators at water and sewer utilities); ENV'T PROT. AGENCY, POWER RESILIENCE: GUIDE FOR WATER AND WASTEWATER UTILITIES 0-1 to -2, 3-1 to -12 (June 2019), https://www.epa.gov/sites/default/files/2016-03/documents/160212-powerresilienceguide508.pdf [https://perma.cc/75LP-4TYF] (discussing "Emergency/Standby Generators" as one way water utilities can increase power resilience); ENV'T PROT. AGENCY, IS YOUR WATER OR WASTEWATER SYSTEM PREPARED? WHAT YOU NEED TO KNOW ABOUT GENERATORS 1 (2009), https://www.epa.gov/sites/default/files/2016-03/documents/waterwastewatersystemgeneratorpreparedn

are often more susceptible to long-term electrical outages, and generators need fuel, which may become an issue if the weather event that caused the electrical outage is widespread.[155]

While many of these risks are common across certain types of utilities, how each utility will be impacted will depend on where they do business and whether they are allowed to proactively manage these risks going forward. So individual utilities will all have slightly different liabilities due to climate change, but regardless of that, they will all face similar challenges in business terms.

1. How Utilities Make Money—and How It Will Be Impacted by Climate Change

Once the economics of utilities are understood, it can become much easier to see why they would not want a change in the duty to serve, and why they would not stop service expansion or continuation on their own.[156] In fact,

> [f]or all the rhetoric in American law about "universal service" and the "duty to serve," during the era of rate regulation consumer service obligations were frequently undertaken voluntarily by utilities as opposed to by legal mandate. . . . Universal service was considered a key part of the natural monopoly franchise bargain even where it was not an express term of the bargain.[157]

As noted in the section on prudency,[158] utilities make money by spending capital.[159] Through rate cases, that capital is added to

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ess.pdf [https://perma.cc/9C59-QKG6] (recommending generators as backups for water and wastewater utilities); *Generators for Wastewater Treatment Facilities*, TOTAL ENERGY SOLS., https://totalenergysolutions.com/project/generators-for-wastewater-treatment-facilities/ [https://perma.cc/LJ6T-E828] (discussing why power is necessary for water and wastewater utility operations).

155. *See Climate Impacts on Water Utilities, supra* note 151 (noting a need for utilities to "[p]lan and establish alternative or on-site power supply").

156. This is not to indicate that a utility would never want to stop serving a customer, even one who is up-to-date on payments to the utility. However, based on historical experience, this seems like it would be a much smaller proportion of accounts/properties, as abandonment proceedings—already in place for precisely such a situation—are rarely used. It is much more likely that a utility would want to continue to serve that customer due to the additional capital that could be spent and, therefore, the additional profit that could be made.

157. Rossi, *supra* note 11, at 388–89.

158. *See supra* Part II.

159. And they are investing record amounts. Charlotte Cox & Jason Lehmann, *U.S. Energy Utility Capex Undeterred by Coronavirus to Date, Slated to Reach $141B*, S&P GLOB. MKT. INTEL. (June 8, 2020), https://www.spglobal.com/marketintelligence/en/news-insights/research/us-energy-utility-capex-undeterred-by-coronavirus-to-date-slated-to-reach-141b [https://perma.cc/LD65-RV7D] ("Projected 2020 capital expenditures for the energy utilities

their rate base. Utilities then earn a profit on that rate base. There is no question that the utility business—and utility infrastructure—will be impacted by climate change. But investor-owned utilities have one way, based on profit, that they would like to address any climate change risk: through increased infrastructure.[160]

This is already starting to happen and is taking many forms.[161] One of the most visible is the accelerated gas pipe replacements.[162] As noted above, methane leakage creates environmental damage. Older gas pipes are also more likely to rupture.[163] Every time those pipes are replaced—and natural gas pipes have a typical lifespan of up to eighty years—ratepayers are expected to pay for the full

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universe currently stands at roughly $140.9 billion, well above 2019's $121.3 billion in capital investment.").

160. *See* Brody et al., *supra* note 103 (noting "harden the grid" as the first theme for utilities improving preparedness and resiliency); *see also* Utility Dive Team, *supra* note 8 (discussing how much it is going to cost to mitigate climate risk for utilities).

161. *See, e.g.*, KAVITA HEYN & WHITNEY WINSOR, PORTLAND WATER BUREAU, CLIMATE RISKS TO WATER UTILITY BUILT ASSETS AND INFRASTRUCTURE 24 (2015), https://www.wucaonline.org/assets/pdf/pubs-asset-infrastructure.pdf [https://perma.cc/SF7M-NZUK] ("The water and wastewater utilities interviewed emphasized the challenges of managing inevitable rate increases brought on by the changes to asset management, operations and capital projects due to extreme weather events and climate change preparation. For many utilities, including DW, the financial costs of meeting service levels are already perceived to be expensive, and preparing for extreme events will only increase costs. CAP is bracing for increases in rates despite a projected decrease in supply due to the drought. CAP would be selling less water but would still have a fixed cost to operate and maintain the same infrastructure. A few providers are spending more money to meet certain levels of service. TRWD customers require as close to 100% reliability of the TRWD transmission system as is possible to achieve, and TRWD internal leadership work closely with customers to ensure that capital improvement and O&M spending realizes this goal."); TIFFANY FINLEY & RYAN SCHUCHARD, BUS. FOR SOC. RESP., ADAPTING TO CLIMATE CHANGE: A GUIDE FOR THE ENERGY AND UTILITY INDUSTRY 1, https://www.bsr.org/reports/BSR_Climate_Adaptation_Issue_Brief_Energy_Utilities.pdf [https://perma.cc/WF5Z-CFS3] ("Climate change is expected to bring warmer temperatures, a rise in sea levels, ice melting in the Arctic, more frequent and severe extreme weather events, and decreased availability of natural resources such as fresh water. While the full impact of climate change on business is not entirely certain, these and other climate-related effects may result in new engineering challenges and increased capital costs for accessing and developing energy resources. They may also affect the reliability of transportation, logistics, and distribution channels to end users. In addition to the direct effects of climate-induced volatility, E&U companies will continue to experience increased political pressure as well as rising consumer and investor expectations for emissions accountability and expansion of the contribution of renewable energy-to-energy supply portfolios.").

162. *See* ANDREAS THANOS & KIERA ZITELMAN, NAT'L ASS'N OF REG. UTIL. COMMR'S, NATURAL GAS DISTRIBUTION INFRASTRUCTURE REPLACEMENT & MODERNIZATION: A REVIEW OF STATE PROGRAMS 7 (2020), https://pubs.naruc.org/pub/45E90C1E-155D-0A36-31FE-A68E6BF430EE [https://perma.cc/W6HM-NP79] (stating how accelerated pipeline replacement has been prioritized).

163. Garance Burke & Jason Dearen, *Aging Gas Pipes at Risk of Explosion Nationwide,* NBC NEWS (Sept. 13, 2010, 6:49 PM), https://www.nbcnews.com/id/wbna39159597 [https://perma.cc/5UKU-42MV].

cost of that infrastructure.[164] Utilities certainly want to replace them—that guarantees profits for them long into the future.[165] But we are not asking whether, given our carbon-constrained world, those pipes should be put into the ground at all.[166] Part of the reason that we need to discuss that infrastructure investment now is that regulators have a history of allowing utilities to profit on their stranded assets.[167]

Hardening of electrical infrastructure is another example of where utilities are spending significant amounts of capital. While many of these projects make sense based on demographics and geography—densely populated areas where risks to underground wires are low—that is certainly not universally the case. Undergrounding in Florida leaves infrastructure susceptible to saltwater intrusion and corrosion, and in California, susceptible to earthquakes.[168]

Another—and perhaps less well recognized—way that generation facilities and utilities will make money off the transition to low- and no-carbon generation is the increase in capital—not just in pure terms for new projects, but in the capital to fuel mix of those assets during their lives.[169] More of the total percentage of the cost

164. *See* Mike Henchen & Kiley Kroh, *A New Approach to America's Rapidly Aging Gas Infrastructure*, ROCKY MTN. INST. (Jan. 6, 2020), https://rmi.org/a-new-approach-to-am ericas-rapidly-aging-gas-infrastructure/ [https://perma.cc/DW9D-J7VV].

165. *See* U.S. DEP'T OF ENERGY, OFF. OF ENERGY POL'Y & SYS. ANALYSIS, NATURAL GAS INFRASTRUCTURE MODERNIZATION PROGRAMS AT LOCAL DISTRIBUTION COMPANIES: KEY ISSUES AND CONSIDERATIONS 6 (2017), https://www.energy.gov/sites/prod/files/2017/01/f 34/Natural%20Gas%20Infrastructure%20Modernization%20Programs%20at%20Local%20 Distribution%20Companies—Key%20Issues%20and%20Considerations.pdf [https://perma. cc/RRQ4-5JRZ] ("While there is increasing interest in accelerating replacement of cast iron and unprotected steel gas distribution pipe for safety, reliability and environmental benefits, there are a variety of barriers. For example, main replacement programs can be costly, with cost per mile to replace pipe from $1 to $5 million. The relatively high cost of pipeline repair and replacement means that LDCs are unlikely or unable to undertake replacement programs without some prior guarantee of timely cost recovery. However, since costs associated with replacement programs are passed on to natural gas consumers, rate-payer impact is always a consideration, particularly for low- and fixed-income consumers.").

166. *See* Henchen & Kroh, *supra* note 164.

167. EISEN ET AL., *supra* note 34, at 775–77.

168. That doesn't mean utilities won't try, given the capital involved. *See* Marcia Heroux Pounds, *Plan to Bury Power Lines Advances—at a Cost to Residents*, S. FLA. SUN SENTINEL (Apr. 26, 2019, 4:20 PM), https://www.sun-sentinel.com/business/fl-bz-fpl-undergrounding-bill-20190422-story.html [https://perma.cc/9Q4M-BRG2].

169. Boyd, *supra* note 10, at 1634 ("Building a low-carbon electric power system will also require enormous investment. Any effective institutional framework for managing this transition will need to mobilize substantially increased amounts of capital. It also seems likely that the resulting system will have a higher capital intensity than the current system. On the generation side in particular, renewables, nuclear power, and fossil generation with carbon capture and storage all are more capital-intensive (that is, they have a higher fixed to

of renewable electricity comes from capital, since the fuel is essentially free.[170] So while the cost of electricity generated from a source like natural gas has part of that cost as capital (the assets in the plant), a good bit also comes from the cost of fuel, which is charged to customers as an operations expense and on which the utility does not earn a profit. For electricity from renewables like wind and solar, almost the entire cost is capital upon which the utility can make a profit.[171] So, as we make this transition, a higher percentage of what the utility spends money on will be capable of earning a profit for the utility, further increasing prices for consumers.

The costs for this infrastructure and new generation are socialized across all a utility's ratepayers.[172] Therefore, specific utility customers whose service may be adding significant cost to the overall customer base will not internalize those costs—they are externalized. The utility is more than happy to provide that service—the additional capital provides them profit.

Given how utilities make money, there are a very limited number of ways that bills could be reduced: decreasing capital spending and decreasing operation and maintenance spending are the two largest. Certainly, operations and maintenance spending, with proper fiscal oversight, could be reduced.[173] But capital—where the utility makes a profit—is more highly sought by utilities and the zeal to overinvest in capital assets has been well documented, leading to little hope for utility self-restraint.[174]

Regulators, then, must be the ones to ask whether climate change requires a different question to be answered—whether that infrastructure spending, and maintaining service to each of those customers—is appropriate and prudent.[175]

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variable cost ratio) than the current fleet of coal and gas plants, in which a substantial share of the cost of electricity is driven by fuel costs.").

170. Seth Blumsack, *Basic Economics on Power Generation, Transmission, and Distribution*, EME 801: ENERGY MKTS. POL'Y & REGUL. (2020), https://www.e-education.psu.edu/eme801/node/530 [https://perma.cc/S3V3-9ZDW].

171. *See* EISEN ET AL., *supra* note 34, at 481 (discussing rate revenue formula).

172. Boyd, *supra* note 10, at 1690 (discussing utilities' socialization of costs through rates and subsidies).

173. *See* Payne, *supra* note 76, at 1039, 1041–43 (describing ways that regulators could require increased utility fiscal transparency and accountability).

174. This is especially true given the recent political scandals, amply demonstrating the acceptance of at least some utilities to pay off legislators or regulators for continued favorable treatment.

175. There are already examples of a utility attempting to maintain service to a group of customers where risk would say it is imprudent. "Pacific Gas and Electric Company (PG&E) on June 7 marked the commissioning of its first hybrid renewable standalone power system,

2. Impacts on Customer Bills

Utility bills are rising faster than the general cost of goods.[176] That burden is not borne equally—multiple studies have demonstrated that low-income citizens and communities of color have a higher energy burden.[177] The increasing customer rates—due to capital investments in replacements, hardening, grid modernization, but also for increase repair work after storms and increasing expenses for activities like tree trimming—come at a time when customers may least be able to afford higher bills due to the global pandemic.[178]

Without increased focus on efficiency and improved building codes (and retrofits), customer bills will also be increasing due to increased electrical load as buildings and transportation become increasingly electrified.[179] As temperatures increase, more energy will be used to keep homes, businesses and institutions at a comfortable and safe temperature. So not only will bills be going up for the same amount of electricity usage—due to increased utility spending—but it is unlikely that customers will be able to maintain their current level of usage. Instead, both load and price per unit of electricity will be increasing. Natural gas will have similar but slightly different challenges. Paired with the potential for certain parts of the utility customer base to voluntarily cease service—by having, for example, their natural gas line capped at the street and the meter removed—which will spread the utility's

built and installed by BoxPower Inc. The remote grid, which permanently replaces the overhead distribution powerlines that once served a handful of customers in the Briceburg community, a High Fire-Threat District (HFTD) area of the Sierra Nevada foothills outside Yosemite National Park, improves reliability and significantly reduces wildfire risk." Clarion Energy Content Directors, *PG&E Commissions Remote Power Grid in Mariposa County*, POWERGRID INT'L (June 11, 2021), https://www.power-grid.com/td/pge-commissions-remote-grid-in-mariposa-county/?utm_medium=email&utm_source=powergrid_weekly_newsletter&utm_campaign=2021-06-17 [https://perma.cc/46B9-6898].

176. *See* Payne, *supra* note 76, at 1016–18 (charting the cost of electricity versus other household goods).

177. *See* Heather Payne, *Electrifying Efficiency,* 40 STAN. ENV'T L.J. 57, 102–03 (2021).

178. *See* Herman K. Trabish, *Utility Customers Owe Up to $40B in COVID-19 Debt, but Who Will Pay It?*, UTIL. DIVE (Dec. 3, 2020), https://www.utilitydive.com/news/customers-owe-billions-in-covid-debt-to-their-utilities-and-somebody-has-to/589525/ [https://perma.cc/7WKG-Z4BT]; Lauren Lee, *An Estimated 205 Million Americans Are at Risk of Utility Disconnection. Here's How You Can Get Help*, CNN (Nov. 12, 2020, 2:57 PM), https://www.cnn.com/2020/11/12/us/utility-disconnection-help-covid-iyw-trnd/index.html [https://perma.cc/ZQ4R-26WK].

179. *See* Justin Gerdes, *'Electrification of Everything' Would Spike U.S. Electricity Use, but Lower Final Energy Consumption*, GREEN TECHMEDIA (July 30, 2018), https://www.greentechmedia.com/articles/read/widespread-electrification-could-increase-u-s-electricity-consumption [https://perma.cc/SQK9-XH5Y].

revenue requirement over fewer customers, bills will also be increasing for the same usage. And, since water and sewer utilities have electricity and natural gas as two of their largest expenses, customers should expect rate increases from those utilities as well. Given how significant the impact might be for utilities and customers, regulators will have a large role in determining the outcome.

B. *Implications for Regulators*

More than for utilities, for regulators which utility service is involved and which prong of the duty to serve is being modified will have significant implications. This section will discuss the main implications for regulators around changes to the duty to serve. While not proposing a model process or a list of potential options, this section will highlight specific considerations that regulators should take into account when deciding whether to modify the duty to serve.

If an area is no longer going to be expanded into—so the expansion prong is being modified, and the utility territory being shrunk—then the utility will likely attempt to claim that the profit on the capital they *would have* spent to serve the area should be allowed to be earned by shareholders.[180] For already existing utility infrastructure which will now no longer be replaced or service will not be continued—depending on the processes and procedures developed and adopted by legislators and/or regulators—it is more likely that the issue raised by utilities will be stranded assets. Across all utilities, regulators will need to address how they mandate that utilities do not profit off stranded assets. Of course, one way to do this is to treat installed assets which are no longer serving customers as no longer used and useful. As has been suggested for natural gas system decommissioning, regulators are traditionally likely to take one of three approaches with these assets, allowing capital recovery by the utility's shareholders, even if they decide not to award them a continuing profit in addition to the recovery of capital.[181] However, given the knowledge about climate change and the impacts of climate change, it is also possible that

180. *See* Gudrun Thompson, Kathleen Sullivan, Michael Regan, Ben Moore & Christina Honkonen, *Duke Energy's Save-a-Watt Program Rejected*, S. ALL. FOR CLEAN ENERGY (Feb. 26, 2009), https://cleanenergy.org/news-and-resources/duke-energys-save-a-watt-program-rejected/ [https://perma.cc/4T6S-PSRE] (discussing Duke's Save-A-Watt proposal including a similarly ludicrous statement).

181. Payne, *supra* note 100, at 731.

regulators could deem these investments imprudent—whether or not they had been deemed prudent in the past and put into rate base.[182]

As with investments in generation facilities that were no longer deemed part of monopoly service during restructuring in the electric utility sector, it is possible that utilities will claim either finding some previous investments imprudent—whether or not they had been deemed prudent in the past—or reducing the size of the utility's franchise or service territory is a taking.[183] While there is some intrinsic comfort to this logic, it is likely to fail. Utilities were given service territories by regulators, and regulators can alter or remove those franchises.[184] Additionally, it is well settled from a constitutional standpoint that utilities do not have the constitutional expectation of a profit.[185] They would have the ability to ask to recoup any prudently incurred costs for assets that were used and useful. If they are unhappy with the response from regulators, they could challenge the overall ratemaking in court, at which point the courts will determine if, indeed, the regulatory response

182. *See id*. at 730–31 (providing examples of where assets have been removed from rate base).

183. *See generally* Fessler & Morelli, *supra* note 3.

184. *See, e.g*., KEVIN MCCARTHY, OLR RESEARCH REPORT, 2011-R-0395: REORGANIZING ELECTRIC COMPANY/TERRITORIES POSSIBLE STATE TAKEOVER OF ELECTRIC COMPANIES (2011), https://www.cga.ct.gov/2011/rpt/2011-R-0395.htm [https://perma.cc/6H8B-5YDH] (noting that utility franchises and territories are a product of state action and so state action can alter them). While this has not been done recently for an electric utility, there are examples in other utility areas. *See* Ryan Randazzo, *Regulators Slap Johnson Utilities With a 600K Fine, Threaten to Revoke Territory,* AZ CENT. (Aug, 14, 2018), https://www.azcent ral.com/story/money/business/energy/2018/08/14/arizona-utility-regulators-fine-johnson-utilities-valley-water-company/989793002/ [https://perma.cc/V5PH-8XLS]; *EPCOR USA Completes Johnson Utilities Acquisition*, INTRADO GLOB. NEWSWIRE (Aug. 14, 2018), https://www.globenewswire.com/en/news-release/2021/01/29/2166866/0/en/EPCOR-USA-Completes-Johnson-Utilities-Acquisition.html [https://perma.cc/5VHX-H2M2] (finalizing transfer of utility assets in water utilities). There have also been threats to end electric franchises due to poor disaster performance. *See* Robert Walton, *Following Botched Utility Response to Hurricane Isaias New York Governor Proposes Stricter Penalties,* UTIL. DIVE (Aug. 26, 2020), https://www.utilitydive.com/news/following-botched-utility-response-to-hurricane-isaias-new-york-governor-p/584153/?utm_source=Sailthru&utm_medium=email&utm_campaign=Issue:%202020-08-26%20Utility%20Dive%20Newsletter%20%5Bissue:29299%5D&utm_term=Utility%20Dive [https://perma.cc/2CMM-JJNF]; Robert Walton, *Following Outrage over Hurricane Isaias Response Connecticut Bill Would Put Utilities on the Hook for Outage Costs,* UTIL. DIVE (Aug. 20, 2020), https://www.utilitydive.com/news/following-outrage-over-hurricane-isaias-response-connecticut-bill-would-pu/583769/?utm_source=Sailthru&utm_medium=email&utm_campaign=Issue:%202020-08-20%20Utility%20Dive%20Newsletter%20%5Bissue:29195%5D&utm_term=Utility%20Dive [https://perma.cc/WM 2N-5GSS] (explaining how there have also been threats to end electric franchises due to poor performance after disaster responses).

185. Jersey Cent. Power & Light Co. v. Fed. Energy Regul. Comm'n, 810 F.2d 1168, 1180–81 (D.C. Cir. 1987) ("A regulated utility has no constitutional right to a profit . . . .").

is confiscatory.[186] However, given the likely limited nature of these actions in comparison with the entire rate base, it is unlikely that any regulatory response would rise to the level of being unconstitutional.[187]

Data will also be critical for determining which individual investments are helpful for dealing with the impacts of climate change, which costs should be socialized, and those costs not a good investment from a climate change perspective, which should not be socialized. If dealing with these during the initial conversation of adding them into the rate base, regulators can deem the latter imprudent at that point, and ensure those costs are not being passed onto consumers. This data is critical for another reason, however: it will enable regulators to determine which currently served or soon-to-be-served properties are truly outside the bounds of reasonableness for other utility ratepayers to subsidize. Regulators should consider those specific properties when looking at implementing the modified duty to serve.

Aside from dealing with the utility impacts, regulators will need to develop processes and procedures to determine when a duty to serve should be modified. It is likely that those will be different for the expansion prong versus the continuation prong; I suspect that utility regulators will be more comfortable not giving utility service at all rather than removing it from users who already have it. The biggest caution here, of course, must be around adequate data. This proposal is for modification to be made specifically on climate change impacts. Regulators must also address the fact that utilities or others may try to propose modifying the duty to serve based on other factors, which could be improper. Adequate consumer protections and involvement could aid in these decisions.[188] Unfortunately, though, the vast majority of utility dockets with minimal customer involvement caution against relying on customers for this self-protection.

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186. *See, e.g.*, Duquesne Light Co. v. Barasch, 488 U.S. 299, 307 (1989).

187. *Id.* at 314 ("[A]n otherwise reasonable rate is not subject to constitutional attack by questioning the theoretical consistency of the method that produced it. . . . The Constitution protects the utility from the net effect of the rate order on its property.").

188. For example, regulators may want to address different categories of property differently; so residential would have one process while C&I properties might have another. Additionally, regulators might want to view second homes or rental properties differently than owner-occupied primary dwellings, similar to the NFIP. It would also be possible for these processes to be in the form of a rebuttable presumption. That presumption would then shift the burden, which might be more politically palatable in certain situations to a more formalized, set process.

One decisive way that regulators could positively impact customers is by taking action and providing sufficient notice. Notice will not be as dramatic around the expansion prong, as property owners are not currently being provided service at that location. However, if modifying the duty to serve will end up ceasing utility service at a location, the timing and duration of notice will be important to enable the property owner to have sufficient time to obtain self-sufficient options to replace the utility service. For example, if electric service is not going to be reestablished to a given property the next time the service is made inoperable by a storm, it would be beneficial for the property owner if they were provided sufficient notice to procure adequate distributed generation and storage before the storm hit, rather than being told they were not going to have service reestablished immediately after the storm came through. While it will take planning by regulators to understand climate change impacts in their geographies and to have developed and established the specific triggers for the duty to be modified, this will provide the most notice to property owners and will aid in any transition.

Regulators will also obviously need to be very concerned about the environmental justice, social justice, and economic justice impacts of their actions. The public health impacts of not having running water and sewer are well documented, as, unfortunately, is the history of providers not extending service based on racial or socioeconomic factors.[189] One of the most concerning implications could be the denial of service (or cessation) based on racial animus.[190] While those with sufficient income might be able to meet their electricity needs with a large solar array and sufficient

189. *See* Catherine Coleman Flowers, Opinion, *Mold, Possums and Pools of Sewage: No One Should Have to Live Like This*, N.Y. TIMES (Nov. 14, 2020), https://www.nytimes.com/ 2020/11/14/opinion/sunday/coronavirus-poverty-us.html [https://perma.cc/S63P-T2U3]; Catherine Coleman Flowers, Opinion, *A Country Where the Sewer is Your Lawn*, N.Y. TIMES (May 22, 2018), https://www.nytimes.com/2018/05/22/opinion/alabama-poverty-sewers.html [https://perma.cc/M86G-RK8G].

190. *See, e.g.*, Gregory A. Kalscheur, Book Note, *Haar & Fessler: The Wrong Side of the Tracks: A Revolutionary Rediscovery of the Common Law Tradition of Fairness in the Struggle Against Inequality*, 85 MICH. L. REV. 1124, 1127–28 (1987) (discussing the problem of inequitable distribution of municipal services); *see also* Note, *The Antidiscrimination Principle in the Common Law*, 102 HARV. L. REV. 1993, 2004 (1989) (noting how the duty to serve has been used in nonutility circumstances to enforce nondiscrimination); Paul Vincent Courtney, Comment, *Prohibiting Sexual Orientation Discrimination in Public Accommodations: A Common Law Approach*, 163 U. PA. L. REV. 1497, 1524 (2015) (making a similar argument around sexual orientation discrimination); Naikang Tsao, *Ameliorating Environmental Racism: A Citizens' Guide to Combatting the Discriminatory Siting of Toxic Waste Dumps*, 67 N.Y.U. L. REV. 366, 390, 401–02 (1992) (applying the duty to serve to municipal actions such as siting and land use).

storage, every citizen does not have those means. Equity and justice will therefore need to be addressed within whatever process or procedure is developed.[191]

Once the duty to serve is modified by regulators, regulators should mandate that regulated utilities will not have the option of serving that customer or piece of property. To ensure the change, the utility's territory would be modified to remove the properties which would have been deemed outside the duty to serve. That part of the territory would also be designated specifically as removed due to the rules around the duty to serve, so another utility would not be able to start providing regulated service there.

However, that may not solve the challenge that some nonutilities (or other utilities, IOUs, municipal, or cooperatives) may *want* to take over the customers or territory that is being removed from an already-existing service territory by modifying the duty to serve. Whether that modification is of the extension prong or the continuation prong, regulators must not allow this to happen. That would, in effect, nullify the action modifying the duty to serve. Especially for extension, there is no reason to allow any sort of collective infrastructure to be built going forward, and regulators should resist any pressure that would allow any to occur. In effect, once that modification decision is made, those areas should be completely off-limits to any sort of collective development.[192]

If properties are being removed from monopoly service that have already been served, regulators may be more hesitant to stop any type of collective infrastructure; should the residents want to form their own utility, that could potentially be a possibility. However,

191. On the other hand, this should not be used as a reason to require disadvantaged communities to stay where they may be harmed. In a dystopian future, I could see a well-meaning regulatory commission writing rules that protected disadvantaged property owners from a modified duty to serve, requiting the utility to provide service regardless of cost or the impacts on the bills of others. Unfortunately, I could also see that mandate then being used as a reason to leave those property owners at the mercy of whatever climate change impacts they might be subjected to, as others—who are subject to the modified duty to serve—have their utilities removed and therefore argue that they should be prioritized for any relocation rather than those who may be facing more dire consequences from climate change but who still must be provided utility service. Regulators must not allow their processes and procedures to be used to skew adaptation and result in a further degradation of justice in this way.

192. This is not the first instance of a proposal of this sort. Parts of the North Carolina Outer Banks may not have any federal funds used for utility development, and therefore minimal expansion has occurred. *See* Shana Campbell Jones, Thomas Ruppert, Erin L. Deadly, Heather Payne, J. Scott Pippin, Ling-Yee Huang & Jason M. Evans, *Roads to Nowhere in Four States: State and Local Governments in the Atlantic Southeast Facing Sea-Level Rise*, 44 COLUM. J. ENV'T L. 67, 101, 120 (2019).

in order to not have exactly the same situation occur again, regulators would need to mandate two things: (1) no structures other than existing ones with current utility service could ever be added to the system, thereby making the problem worse; and (2) any and all interconnections with any other system would need to be destroyed (for the ones that currently existed) and no new ones would ever be permitted. This would completely island those properties.[193] Unlike other utilities, these entities should have no right of eminent domain, and should not be able to expand their use of or have access to additional rights-of-way.[194] Additionally, a deed restriction would also be recorded, in the nature of a permanent *lis pendens*, enabling all those who might be interested in the property to know before purchasing the property that it would not be furnished with standard utility service.

One potential path that regulators may consider pursuing is abandonment: the process used when utilities decide they want to permanently cease service to a customer. This may seem alluring from a regulatory and political perspective: the procedures already exist,[195] and it is typical that the utilities must compensate the owner sufficiently to put them in a similar position. For example, if the utility was ceasing to provide customers with steam service which they had been using for home heating purposes, the utility would be responsible for providing the necessary furnace or boiler which would enable the property owners to have heat. If the utility had been supplying piped natural gas and wanted to cease service due to low customer volumes and high line maintenance or

193. Of course, there are many other questions the utility commission would need to answer before a proposal like this could be put in place. Would the residents need to pay the utility for the infrastructure that they were leaving behind, since it would still be useful? If so, how would the valuation occur? Would the group need to file with the PUC as a utility, and be subject to the same rules and things like reporting requirements that utilities are subject to? Typically, only utilities can cross public rights-of-way; a group cannot cross a public road, for example, in most states without being considered a utility. So either that requirement would need to be modified or the roads would need to become private (which may also be happening based on adaptation actions). *See id.* at 107–08, 115–16. Would property owners who did not want to partake in the collective infrastructure be required to do so, or would it be purely voluntary? While there are insufficient room to address all the complexities, if they would like to make this available as an option, PUCs would need to address these questions and more.

194. This is again necessary to ensure that these do not end up causing the same issues—astronomical service costs—as the utility whose service territory has been modified to stop mandated service.

195. *See, e.g.*, ARIZ. ADMIN. CODE § R14-2-202(B) (2021) (discussing electric abandonment); *id.* § R14-2-302(B) (2021) (discussing gas abandonment); *id.* § R14-2-402(C)-(D) (2021) (discussing water abandonment); *id.* § R14-2-502(B) (2021) (discussing telephone abandonment); *id.* § R14-2-602(D)-(E) (2021) (discussing sewer abandonment).

replacement costs, then the utility would be responsible for providing the funds to set up a propane tank on the property and ensure all appliances that had been working on natural gas were either compatible with propane or switched over to electricity.

I would caution regulators from taking the seemingly straightforward and easy path of abandonment, however, at least in the cases where the continuation prong is the one being modified.[196] This is for two main reasons: first, the utility, in many cases, may be perfectly happy to continue serving that customer, and it is a decision by the regulator for the economic good of other customers that they are being told not to do so; and second, abandonment would automatically add the cost of supplying those customers with alternate methods of self-sufficiency (solar panels, batteries, a well, reverse osmosis water filtration system) to the rate base. Adding that cost to the rate base for others to pay for would be counterproductive and, in many cases, simply unfair. The precise reason for the need to modify the duty to serve for these properties is the outsize subsidy they have received or would be receiving due to the required capital to serve them and the economic impact of that utility investment on others' rates. Allowing the costs of private systems to be added to the rate base would simply continue to make other ratepayers pay for these customers, yet again providing them a continued subsidy at the expense of others.

Of course, one could argue that it would be a one-time payment rather than continuing, growing payments based on the duty to serve remaining in an unmodified form; but that hardly is sufficient to mandate that it occur as a matter of policy in all cases. This is not to say that there should be no path for individuals to request help. Especially based on socioeconomic or environmental justice concerns, public utility commissions may want to have programs that would help in certain circumstances. But it should not be universally applied with the costs added for other rate payers to assume, as it would be if abandonment proceedings were utilized.

Another option regulators may choose as an alternative to modifying the duty to serve is to attempt to put certain ratepayers into a separate rate class to deal with the cross-subsidization issue. Separate rate classes are often used in utility rate case proceedings to divide up the utility's revenue requirement and therefore the

196. Abandonment proceedings may be fine where the extension prong is being modified, as there would be no substitute utilities, systems, or appliances to be offered, with the costs passed onto other ratepayers.

costs that should be borne by specific groups of customers.[197] I would caution against taking this step for several reasons. First, it does nothing to solve the underlying problem of unsustainable utility infrastructure spend. Even if those customers are segmented out and paying for the infrastructure, it will continue to be an ongoing problem. Second, this solution would assume that ever-increasing utility bills are sustainable for the properties that would continue to be served by the monopoly utility. This may not be true. It may be more economical for the properties to become self-sufficient and cease paying utility bills completely rather than pay extraordinarily high monopoly utility bills with a guaranteed profit margin for the utility included. Finally, if done appropriately, this rate class may be one that is constantly increasing, leading to an administrative burden that would not exist if the utility duty to serve were modified instead. Once the utility duty to serve is modified and a property either cannot have services expanded to it or has notice that services either have or will cease upon a given occurrence, that property does not need to be handled administratively again. If a separate rate class were to be used, that would not be the case; rather, it would be moved into a separate rate class not only once, but perhaps multiple times, as different rate classes proliferated to deal with different levels of risk.

Whatever processes and procedures are put in place, it is likely that regulators will be sued by property owners unhappy with the decision. In my opinion, the most likely cause of action against regulators would be a writ of mandamus to provide utility service, trying to force them to reverse a decision to modify both the duty to serve and the monopoly territory which must be served by the utility. The argument would be that modifying the territory was either a failure to perform a duty or an abuse of discretion.[198] For the reasons listed above, it is likely to fail.

197. Typically, these classes are residential, small commercial, and large commercial and industrial ("C&I"). It is also common to lump small commercial customers in with residential, so you essentially end up with residential and C&I as the two main groups. It is also possible to make different distinctions, with residential broken out into separate rate classes. *See, e.g.*, ROBERT HOGLUND, CONSOL. EDISON CO. OF N.Y., SCHEDULE FOR ELECTRICITY SERVICE (Apr. 1, 2012), https://www.coned.com/_external/cerates/documents/elecPSC10/electric-tariff.pdf [https://perma.cc/5ANZ-3W25]; STAFF SUBCOMM. ON RATE DESIGN, NAT'L ASS'N OF REGUL. UTIL. COMM'RS, NARUC MANUAL ON DISTRIBUTED ENERGY RESOURCES RATE DESIGN AND COMPENSATION 35, 86 (2016), https://pubs.naruc.org/pub.cfm?id=19FDF48B-AA57-5160-DBA1-BE2E9C2F7EA0 [https://perma.cc/ER7P-MUJ8].

198. *See generally Mandamus*, LEGAL INFO. INST., https://www.law.cornell.edu/wex/mandamus [https://perma.cc/L3T2-R8HU].

C. *Implications for Property Owners*

In addition to climate change impacts manifesting a need for regulators to undertake modification of the duty to serve, technological changes to our utility systems and appliances have made this a possibility in ways that were not true when our regulatory frameworks were developed a century ago. Based on available alternatives, there will be different challenges for property owners who find themselves without utility service based on a modified duty to serve, dependent on which utility they will no longer have access to (electricity, natural gas, water, or sewer).

The most common uses for natural gas, for example—heating, hot water, cooking, and clothes drying—all have electrical equivalents. Increasing energy efficiency and insulation technology means that similar results, comfort-wise, can be made with smaller, all-electric HVAC systems. Home water purification systems are available to treat whole-house quantities, whether supplied by wells, surface water bodies, or a municipal system.[199] Home-scale sewage treatment plants are also available, negating the need for connection to a community or municipal sewer treatment plant.[200] Systems can also be installed to treat grey water into potable water to be reused for all household uses.[201] These technological advances enable living comfortably without a utility connection to be an option.

The duty to serve is founded on the idea that a customer is a recipient of utility service. For all the "standard" utilities, that need no longer be an accurate characterization. It is possible for customers to have their own supply now—with electric appliances replacing any that were gas and batteries for when generation sources are off-line.[202] That electricity can also supply water and treat wastewater—all at the level of an individual home.

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199. *See, e.g.*, Erica Puisis, *The 7 Best Whole House Water Filters of 2021*, THE SPRUCE (Sept. 13, 2021), https://www.thespruce.com/best-home-water-filters-4159152 [https://perma.cc/5QSP-QXMA]; *Choosing Home Water Filters & Other Water Treatment Systems*, CTR. FOR DISEASE CONTROL & PREVENTION (Aug. 4, 2020), https://www.cdc.gov/healthywaterdrinking/home-water-treatment/water-filters/step1.html [https://perma.cc/BZ5U-5KTJ].

200. *See Off-Grid Waste*, COMPLETELY GREEN, https://completely-green.com/green-technologies/off-grid-home-systems/off-grid-waste/ [https://perma.cc/S83R-PE78].

201. *See* Clive Lipchin, *Water, Wastewater, and Energy Solutions for Off-grid Bedouin, Palestinian, and Jordanian Communities*, ARAVA INST., at 22, https://wrrc.arizona.edu/sites/wrrc.arizona.edu/files/Off-grid.pdf [https://perma.cc/93L4-KDTG].

202. *See* Campbell, *supra* note 2, at 01:01. We are in fact already seeing this occur: Green Mountain Power offers an off-grid rate when they determine that it is cheaper for the utility

While electricity may be what most people think of when they consider "off-grid" living, it is not just cutting the cord from an electric utility that is feasible now. Natural gas has never been considered a necessity; indeed, it is frequently only available in urban and suburban locations, with no connections for those in more rural areas.[203] While "town gas" has been a feature of urban living for more than a century,[204] as noted above, electrical replacements are available that render its use unnecessary.[205]

Water and sewer utilities may be harder for regulators to address due to public health concerns. While not having access to municipal or community sewer is already a fact for many, septic systems will have their own challenges suffering from the impacts of climate change: inundation from higher flood plains, flooding, erosion from sea level rise, all likely leading to an increasing number of plots which would be deemed uninhabitable without sewer access.[206] However, more sewer infrastructure may be exactly the opposite of what is needed. Water utilities will also face challenges,

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to solve those customer requirements off-grid than to connect them to the grid. *See* Press Release, Green Mountain Power, Green Mountain Power is First Utility to Help Customers Go Off-Grid with New Product Offering (Dec. 20, 2016), https://greenmountainpower.com/green-mountain-power-first-utility-help-customers-go-off-grid-new-product-offering/ [https://perma.cc/7PYR-QA32].

203. Amy Sisk, *Filling in the Natural Gas Gap*, INSIDE ENERGY (Apr. 6, 2017), http://insideenergy.org/2017/04/06/filling-in-the-natural-gas-gaps/ [https://perma.cc/2VT4-DYEU] ("Big gaps exist in rural America where natural gas does not reach.").

204. *See, e.g.*, AIR & ENERGY ENG'G RSCH. LAB., EPA, SURVEY OF TOWN GAS AND BY-PRODUCT PRODUCTION AND LOCATIONS IN THE U.S. (1880–1950) (1985), https://nepis.epa.gov/Exe/ZyPDF.cgi/20012XT3.PDF?Dockey=20012XT3.PDF [https://perma.cc/JF9C-DKJJ] (discussing locations that manufactured town gas from 1889 to 1950 and the environmental effects of that production).

205. Charcoal, wood, and propane are options if electricity does not provide an adequate substitute for specific non-necessary uses, such as grills or outdoor fireplaces.

206. *See*, *e.g.*, *Septic Systems—What to Do after the Flood*, EPA, https://www.epa.gov/ground-water-and-drinking-water/septic-systems-what-do-after-flood [https://perma.cc/DT59-6L67]; Zachary Hozid, *The Hidden Risk to Clean Water in the Age of Climate Change: Septic Systems*, CONSERVATION L. FOUND. (Feb. 24, 2017) https://www.clf.org/blog/climate-change-risks-septic-systems/ [https://perma.cc/W8LL-TFAV] ("In order for septic systems to properly filter wastewater, there must be enough unsaturated soil between the leachfield and the groundwater table. The system works so long as the groundwater levels remain relatively constant. But climate-change-induced sea level rise and increased precipitation are raising groundwater tables across New England. As water tables rise, the amount of unsaturated soil for the wastewater to filter through is reduced, making septic systems less effective. More frequent and intense rain- and snowfall also reduces the amount of oxygen in the soil. Oxygen is a key component of the chemical processes that break down pathogens in wastewater. Similarly, rising temperatures also result in less oxygen available for necessary aerobic treatment processes."); *see also* MELISSA CHALEK, MARINE AFFS. INST., MAINTENANCE OF WATER AND SEWER INFRASTRUCTURE IN RESPONSE TO SEA LEVEL RISE IN MASSACHUSETTS (2020), https://docs.rwu.edu/cgi/viewcontent.cgi?article=1004&context=law_ma_sp [https://perma.cc/7RWM-VM9U] (discussing impact of sea level rise on water and sewer utilities and infrastructure).

especially with sea level rise. However, wells and reuse technology provide an alternative.

Even with those alternatives, there will obviously be implications for properties subject to a modified duty to serve: potentially lower property values, inconvenience, more difficulty for resale, to name a few. While property owners are likely to bring various claims, it is unlikely, based on current jurisprudence, that they would be successful.

1. No, This Is Not a Taking

The most likely cause of action that would be brought and the reason that entities, especially municipal utilities, might be timid about taking action is for fear of takings claims.[207] However, under the Supreme Court's current regulatory takings jurisprudence, the modified duty to serve would not count as a regulatory taking, and therefore, neither the utility nor the regulatory body would be required to pay damages.

The first claim by a property owner contesting the modified duty to serve through takings would likely be that the regulatory action has rendered the property valueless, hoping to take advantage of the categorical rule set out in *Lucas v. South Carolina Coastal Council*.[208] In *Lucas*, the Supreme Court declared that a property owner is entitled to compensation when a "regulation denies all economically beneficial or productive use of land."[209] Based on all the technological options outlined above, however, the regulatory action would not render the land valueless. This would bring it out of the categorical takings' realm, and, if it were found that a taking occurred, it would need to be under a different constitutional theory.

The next likely claim a property owner might make is that any regulation which modifies the duty to serve is a facial taking. While rarely successful and suspect based on the Supreme Court's decision in *Lingle v. Chevron U.S.A. Inc.*,[210] a court would apply the

207. *See Adaption Resources*, SABIN CTR. FOR CLIMATE CHANGE L., https://climate.law.columbia.edu/content/adaptation-resources [https://perma.cc/E9RE-DSLU].

208. 505 U.S. 1003, 1015 (1992).

209. *Id.*

210. 544 U.S. 528 (2005); *see also* John D. Echeverria, *Making Sense of* Penn Central, 23 UCLA J. ENV'T L. & POL'Y 171, 199 (2005) ("[T]he issue in *Lingle* was the validity of the 'substantially advances' takings test. The Court concluded that this test 'prescribes an

two-part *Agins v. City of Tiburon* test, asking: "(1) does the regulation substantially advance a legitimate governmental interest? (2) does the regulation deprive the owner of economically viable use of property?"[211] The government has a legitimate interest in not forcing the heavily subsidized continued provision of services to areas when continued provision will provide hardships to those giving the subsidy, especially where it is already known that that subsidy will continue to increase over time due to the ravages of climate change. The government has a legitimate interest in the economic well-being of all its citizens, not just those paying greatly reduced rates in comparison to what the system is spending to serve them. Additionally, climate change adaptation writ large should be considered a legitimate governmental interest. As to the second part of the *Agins* test,[212] as noted above with regard to the *Lucas* test,[213] it is unlikely, based on the current state of technology, that the regulation would deprive the owner of all economically viable uses of the property.

Property owners would then likely attempt to claim a taking as the regulation is applied to their specific parcel and circumstances. This would be analyzed under the *Penn Central Transportation Co. v. New York City* framework.[214] As the Court itself noted in *Penn Central*, takings litigation thus far had been "unable to develop any 'set formula' for determining when 'justice and fairness' require" compensation.[215]

> In an apparent effort to begin to give *some* content to regulatory takings analysis, the Court identified three factors with 'particular significance' in a takings case: (1) the 'economic impact' of the government action, (2) the extent to which the action 'interferes with distinct investment-backed expectations,' and (3) the 'character' of the action.[216]

Continued litigation has not necessarily made the application of these factors any clearer.[217]

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inquiry in the nature of a due process, not a takings, test, and that it has no proper place in our takings jurisprudence.'").

211. 447 U.S. 255, 260 (1980); Wendie L. Kellington, *New Takes on Old Takes: A Takings Law Update*, ALI-ABA 17TH ANN. LAND USE INST. (2001), https://landuselaw.wustl.edu/takings_update.htm [https://perma.cc/ACN6-869M].

212. *Agins*, 447 U.S. at 260–63.

213. *See supra* note 208 (*Lucas* Test).

214. *See* 438 U.S. 104, 124 (1978).

215. *Id.* at 124.

216. Echeverria, *supra* note 210, at 171.

217. *See generally id.* at 209–10.

As noted above with discussions of the *Lucas* and *Agins* analyses, any economic impact is likely to be mitigated by available technologies. Absent "a very significant economic impact, a regulatory taking claim will generally fail; as the Supreme Court has explained, takings recovery is limited to 'extreme circumstances.'"[218] This factor is likely to weigh in favor of finding no taking.

The "interfer[ence] with distinct investment-backed expectations" is likely to vary much more on an individual parcel basis.[219] However, *Palazzolo v. Rhode Island* may be instructive here.[220] In *Palazzolo*, the Court held that notice of pre-existing regulations was not an absolute bar to a takings claim.[221] However, "advance notice of a regulatory constraint is a factor to be weighed, along with other factors, in assessing a claim."[222] Given that there is adequate scientific understanding of climate impacts such as sea level rise, and that climate impacts are still accelerating, courts should take high-impact climate models as proof of notice,[223] and act accordingly. If scientific projections exist, the court should deem this, at a minimum, as constructive notice. Actual notice should not be required. As "[t]akings claims brought by purchasers with notice continue to be rejected on a fairly routine basis,"[224] this would limit the compensation of anyone who paid significant sums without bothering to determine that their investment was at risk from climate change, or, even if they had actual notice, potentially overpaying for a risky investment and then attempting to claim a windfall when that risk materialized.

Courts have also taken into account "whether the adoption of new regulations was foreseeable."[225] Many things would seemingly be taken into account in this analysis. Climate change impacts are well documented. The increasing risks to property associated with those impacts are well known. The need for adaptive actions around climate change impacts is discussed (or, more often, argued

218. *Id.* at 178.

219. *Penn Cent. Transp. Co.*, 438 U.S. at 124.

220. *See* 533 U.S. 606 (2001).

221. *Id.* at 632.

222. Echeverria, *supra* note 210, at 183.

223. *E.g., Scenario Process for AR5, Representative Concentration Pathways (RCPs),* IPCC, https://sedac.ciesin.columbia.edu/ddc/ar5_scenario_process/RCPs.html [https://perma.cc/6SKA-47K4].

224. Echeverria, *supra* note 210, at 183–84.

225. *Id.* at 184.

about) at every level of government.[226] The spending by utilities in relation to climate change impacts is well documented. Rate increases by utilities to pay for the capital infrastructure necessary to address risks from climate change impacts is well documented. That those rates continue to cause energy poverty and that that energy poverty is increasing is also well known.[227] Put together, it cannot be anything other than foreseeable that regulators would determine actions focused on adaptation which would limit increasing bills by reducing further capital infrastructure spending by the utilities in those locations most impacted by climate change are necessary.

In *Penn Central* itself with the investment-backed expectation prong, the Court stressed that the railroad company could keep using the property for exactly what it had been using it for during the preceding decades: a railroad terminal.[228] Here, too, the test is likely to demonstrate a taking has not occurred. Again, based on the available technology, if a property was being used as a residence, it is likely after the duty to serve is modified it can still be used as a residence. Therefore, under any incarnation of the investment-backed expectation prong, it is unlikely that this prong would suggest a taking as occurred.

The third and final *Penn Central* factor, the "character of the action,"[229] has been described by Professor John Echeverria as "a veritable mess."[230] Having been used to describe multiple options in the past,[231] there are now essentially four definitions of character that must be discussed.[232] The first deals with a temporary

226. *See, e.g.*, Anne C. Mulkern, *Coastal City Refuses to Retreat*, SCI. AM. (Oct. 7, 2019), https://www.scientificamerican.com/article/coastal-city-refuses-to-retreat/ [https://perma.cc/85CL-LYNN] (discussing California Coastal Commission's decision regarding Del Mar, a coastal California town's decision not to retreat).

227. *See* Payne, *supra* note 177, at 102–04 (discussing inequitable energy burdens); ARIEL DREHOBL & LAUREN ROSS, AM. COUNCIL ENERGY-EFFICIENT ECON., LIFTING THE HIGH ENERGY BURDEN IN AMERICA'S LARGEST CITIES: HOW ENERGY EFFICIENCY CAN IMPROVE LOW INCOME AND UNDERSERVED COMMUNITIES 16–19 (Apr. 2016), https://www.aceee.org/sites/default/files/publications/researchreports/u1602.pdf [https://perma.cc/U5WA-EUYV] (documenting energy costs and burdens).

228. Penn Cent. Transp. Co. v. N.Y.C., 438 U.S. 104, 136 (1978) ("Its designation as a landmark not only permits but contemplates that appellants may continue to use the property precisely as it has been used for the past 65 years: as a railroad terminal containing office space and concessions. So the law does not interfere with what must be regarded as Penn Central's primary expectation concerning the use of the parcel.").

229. *Id.* at 130.

230. Echeverria, *supra* note 210, at 186.

231. *Id.*

232. *Id.* at 203.

physical occupation of the property.[233] That would not be an issue with a modified duty to serve. Second, "the character factor must include consideration of whether a regulation impairs the right to devise private property to one's heirs."[234] There would be no impact to the right to devise by modifying the duty to serve.

Third, the court will "focus[] on whether the regulation targets one or a few owners or is more general in application."[235] This is because of the long history of "reciprocity of advantage" in regulatory takings jurisprudence and the need for fairness in regulations.[236] The standard analysis has been that "examining the generality versus particularity of a regulation provides useful insight into whether a regulation imposes an unfairly onerous burden."[237] Interestingly for modifying the duty to serve, however, economic *injustice* would occur if the regulation were not enacted. The only way to have fairness and justice in utility rates, given the situation with climate change and the need to spend increasing amounts on capital infrastructure, is to have this regulation modify the duty to serve in relation to specific parcels and areas of utility territory. Rather than the burdens of regulating falling on a few, in this case, the burdens of not regulating fall on the many, with significant economic impacts.

Lastly, courts will assess "whether a regulation is benefit-conferring or harm-preventing. Everything else being equal, a regulation that is designed to protect neighboring owners and the community as a whole from serious harms should be less likely to generate a finding of a taking than a benefit-conferring regulation."[238] Modifying the duty to serve would certainly protect the remaining community from serious harms—economic harms, certainly, but also the detrimental operational impacts to the continued functioning of each utility system as a whole as well. For example, a water main break in one location can mean that every customer of the system loses potable water; the operational impacts are not necessarily limited to those closest to the break.

Provided with these four potential options for the focus of the character analysis, three of the four clearly point to a finding that

233. *Id.*
234. *Id.*
235. *Id.* at 204.
236. *See* Pa. Coal Co. v. Mahon, 260 U.S. 393, 415, 422 (1922) (both majority and dissent); Penn Cent. Transp. Co. v. N.Y.C., 438 U.S. 104, 139–40, 147 (1978).
237. Echeverria, *supra* note 210, at 204.
238. *Id.* at 207.

no taking has occurred. The only one that could potentially attempt to show a taking had occurred by modifying a duty to serve would attempt to say that the unfairness of all ratepayers continuing to heavily subsidize service to others indefinitely and at increasing expense is less unfair than having those particular parcels or areas find self-sufficient solutions which technology could provide. Provided the state has a process or procedure that addresses the concerns discussed above, it seems that would not be a winning argument either. Therefore, none of the three *Penn Central* factors are likely to weigh in favor of finding a regulatory taking has occurred.

A property owner might also attempt to sue either the public utility commission or the specific utility for negligence. Of course, to have a cause of action for negligence, you need to have a duty. So, the argument would be that the original duty mandated either a continuation of service or the ability to have service through the expansion prong of the duty to serve, and that any modification would be moot. Given that, as described above, the duty came from common law and regulatory or legislative action can modify the common law, it is unlikely that this cause of action would be successful.

Property owners might also attempt to sue the utility for breach of contract or breach of an implied contract. Of course, to have a breach of a contract, you need a contract in the first place. While the tariff filed with the state utility commission governing the terms of service for all ratepayers may qualify as a contract, that contract can be modified by the regulatory or legislative body based on public policy grounds. Modifying the duty to serve would be doing precisely that. Property owners, especially those currently receiving service from the utility, may try to claim that there is an implied contract to continue service based on custom and the course of trade. Current utility customers typically expect continued service. Additionally, property owners whose properties are not yet connected to the utility system typically expect extension upon request. However, contracts can be nullified by changes in public policy, and modifying the duty to serve would be precisely that. There is no guarantee of continued service. Once the duty to change is modified, the utility would have a defense of illegality—doing what a property owner would want would go against the scheme regulating them. Therefore, while it is likely that property owners would, indeed, attempt to claim that any modification of the duty to serve is a taking or that the decision should be reversed on other legal grounds, it is unlikely that their claims would be

successful. As this discussion demonstrates, it is critical to get the policy, processes, and procedures correct and implementing the values we want, because legal claims will not do that work for regulators and legislatures.

2. Equity and Other Concerns

As detailed above, the main concern with modifying the duty to serve is that some customers may be left without service—that the elimination of the duty to serve might jeopardize the continuation of service especially to geographically remote areas or areas especially hard hit by climate change impacts. This could have very different equity concerns depending on whether the expansion or the continuation prong of the duty to serve was the one being modified.

For areas where the expansion prong of the duty to serve is implicated, there are relatively fewer equity concerns. While the property value might decrease because it is no longer available for the same type of development, the climate risks that mandated the PUC's actions in removing the duty to serve likely made it unsuitable for this development already, at least in a reasonable and responsible way.

For areas where continuing service is being stopped, the equity concerns are more significant. Not replacing utility service, without the capital available to install replacements, would likely render a home uninhabitable. This could lead to the inability to resell the property, with a corresponding loss of equity. As noted above, this needs to be part of any process or procedure developed by a public utility commission.

Consumer protection—recognized as a potential issue when retail markets were opening—is therefore something that will need to be addressed.[239] At least for electrification, the very customers that a utility determines have a high cost to continue to serve would likely be the very locations that, if all costs were internalized, would be cheapest to serve with off-grid solutions. However, access to capital may be a challenge and will likely need to be addressed in the plan developed by regulators. While most current customers, if asked, would likely want to maintain their utility

239. Rossi, *supra* note 4, at 1237 ("With the growth of competition, regulators and courts face new issues regarding the protection of consumers, particularly residential customers who historically have purchased their service at retail from the incumbent public utility serving their community.").

service rather than not (even given the abysmal customer service ratings that utilities receive), having access to this market could spur new solutions and encourage competition to develop utility-free solutions.

CONCLUSION

With its foundations in common law, the duty to serve will remain unless legislative or regulatory action is taken to modify it, and it will lead to increasingly expensive actions on the part of utilities. Of course, the best way to address these concerns may not be with the PUC at all; a more comprehensive managed retreat program, coordinated across all agencies, at the federal, state, and tribal levels, could most certainly provide a more equitable solution. However, based on the buy-out programs offered through FEMA, it seems unlikely that state and local governments are going to be receptive to such programs, even when the majority of the funds are federal, until individual situations are truly dire.

At a minimum, modifying the duty to serve will need to be part of a larger process. That process will need to take differences in geography, the specific climate impacts, the situation of specific utilities, and so many more factors into account. As with much of utility law, there will likely be fifty slightly different processes and various factors for modifying the duty to serve taken into account, just as the current incarnation of the duty to serve is not uniform—nor uniformly defined—across the states.

This Article posits common issues that regulators will need to address, and that they need to start thinking about now: the duty to serve, as developed by common law, will become increasingly expensive for utilities to fulfill; a utility action to meet the duty to serve that was once prudent may no longer be prudent; a mechanism for reevaluating prudency needs to exist; because of their profit motives and desire to spend capital, utilities will not move to modify the duty to serve on their own; and, given the accelerating impacts of climate change, without modification, costs associated with the duty to serve will bring about economic injustice. While it is impossible, at this point in time, to say exactly what situations will develop where, it is enough to know now that they will occur, and that they will become obvious over time. We must be ready.

Appendix A—Duty/Obligation to Serve in Fifty States

State	Reference
Alabama	ALA. CODE § 37-1-49 (2021)
Alaska	ALASKA STAT. § 42.05.291 (2020)
Arizona	ARIZ. REV. STAT. § 40-361(B) (LexisNexis 2021)
Arkansas	ARK. CODE ANN. § 23-3-113 (2021)
California	CAL. PUB. UTIL. CODE § 451 (Deering 2021)
Colorado	COLO. REV. STAT. § 40-3.5-101(3) (2021)
Connecticut	CONN. GEN. STAT. § 16-20(b) (2021)
Delaware	DEL. CODE ANN. tit. 26, § 209 (2021)
Florida	FLA. STAT. § 366.03 (2021)
Georgia	GA. CODE ANN. § 46-2-20(c) (2021)
Hawaii	State of Haw. Pub. Util. Comm'n, General Order No. 7, Standards for Electric Utility Service in the State of Hawaii para. 1.2(a)
Idaho	IDAHO CODE § 61-302 (2021)
Illinois	220 ILL. COMP. STAT. 5/8-101 (2021).
Indiana	IND. CODE § 8-1-2-4 (2021)
Iowa	IOWA CODE § 476.8 (2021)
Kansas	KAN. STAT. ANN. § 66-101(b) (2020)
Kentucky	KY. REV. STAT. ANN. § 278.030(2) (LexisNexis 2021)
Louisiana	LA. STAT. ANN. § 45:122 (2021)
Maine	ME. STAT. tit. 35-A, § 301(1) (2020)
Maryland	MD. CODE ANN., PUB. UTIL. § 5-303 (LexisNexis 2021)
Massachusetts	220 MASS. CODE REGS. 11.04(9)(a) (2019)
Michigan	MICH. COMP. LAWS § 460.10 (2017)
Minnesota	MINN. STAT. § 216B.04 (2021)
Mississippi	MISS. CODE ANN. § 77-3-33 (2021)
Missouri	MO. REV. STAT. § 393.130 (2002)
Montana	MONT. CODE ANN. § 69-3-201 (2021)
Nebraska	NEB. REV. STAT. § 70-1101 (1963)
Nevada	NEV. REV. STAT. § 704.040 (2017)
New Hampshire	N.H. REV. STAT. ANN. § 374:1 (2021)
New Jersey	N.J. STAT. ANN. § 48:3-3(a) (West 2021).
New Mexico	N.M. STAT. ANN. § 62-8-2 (2021)
New York	N.Y. PUB. SERV. LAW § 65(1) (LexisNexis 2021)
North Carolina	N.C. GEN. STAT. § 62-131(b) (2021)
North Dakota	N.D. CENT. CODE § 49-04-01(2021)
Ohio	OHIO REV. CODE ANN. § 4905-22 (LexisNexis 2021)

Oklahoma	Okla. Gas & Elec. Co. v. Wilson & Co., 288 P. 316, 322 (Okla. 1930) (citing Okla. Gas Co. v. Corp. Comm'n, 211 P. 401 (Okla. 1922))
Oregon	OR. REV. STAT. § 757.020 (2021)
Pennsylvania	66 PA. CONS. STAT. § 1501 (2021)
Rhode Island	39 R.I. GEN. LAWS § 39-2-1(a) (2021)
South Carolina	S.C. CODE ANN. § 58-27-1510 (1962)
South Dakota	S.D. CODIFIED LAWS § 49-34A-2 (2021)
Tennessee	TENN. CODE. ANN. § 65-4-114 (2021)
Texas	TEX. UTIL. CODE ANN. § 186.002 (West 2021); TEX. UTIL. CODE ANN. § 38.001(West 2021)
Utah	UTAH CODE ANN. § 54-3-1(LexisNexis 2021)
Vermont	VT. STAT. ANN. tit. 30, § 219 (2021)
Virginia	VA. CODE ANN. § 56-234(A) (Repl. Vol. 2019)
Washington	WASH. REV. CODE. § 80.28.010 (2011)
West Virginia	W. VA. CODE § 24-3-1(2021)
Wisconsin	WIS. STAT. § 196.03 (2015)
Wyoming	WYO. STAT. ANN. § 37-3-112 (2021)