FIGHTING FIRE WITH FIRE-HARDENED HOMES: THE ROLE OF ELECTRIC UTILITIES IN RESIDENTIAL WILDFIRE MITIGATION

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Wildfires throughout the West are a drastic consequence of climate change. In California especially, the costs of wildfires have become unbearable. Current statutory solutions, such as Assembly Bill 1054 (AB-1054), focus on apportioning liability for damages between insurance companies, government programs, and the electric utilities that often spark the fires, but legislation often fails to address the factors that make damages so astronomical in the first place. In the Wildland–Urban Interface, where forests and undeveloped land meet infrastructure and housing, many older, uninsured homes in low-income communities are built with flammable material, which accelerates the intensity and spread of wildfires. These homeowners, however, lack the funding and resources necessary to retrofit their homes to fire-safe standards and updated building codes. When more wildfires inevitably start, these homes will be completely destroyed, the costs of which will be borne by the entire state.

This Note offers a statutory solution that moves beyond shifts in liability. It argues that electric utilities in California should be required to engage in residential wildfire mitigation in the homes of their lowest-income ratepayers in order to be eligible for wildfire relief funds provided by AB-1054. Situating the Wildland–Urban Interface as a "commons" that requires collective investment, this Note proposes that each electricity user pay a statutory surcharge to fund equitable mitigation investments that will ultimately reduce California's overall wildfire-related costs. It finds precedent in California's earthquake home-retrofitting program and utility-run energy efficiency programs to argue that electric utilities are optimally situated to increase the safety of their most vulnerable citizens and are under a regulatory mandate to do so.

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INTRODUCTION

The need for decisive action to fight California's wildfires has never been clearer. The eerie, red-orange glow of California's skies and the 4.2 million acres burned in 2020 have made the consequences of climate change impossible to overlook.[1] The state must determine what mitigation, prevention, and safety measures it can require of those who play a role in wildfires and how it can regulate their relationships accordingly. Assembly Bill 1054 (AB-1054) is one attempt to redistribute

1. CAL FIRE, 2020 Incident Archive, CA.gov, https://www.fire.ca.gov/incidents/2020 [https://perma.cc/Z57K-PTGP] [hereinafter 2020 Archive] (last visited Jan. 28, 2022).

the burden of wildfires throughout the state.[2] In brief, it reduces the liability shouldered by electric utilities, creates a wildfire liability fund to pay victims' claims, requires electricity ratepayers statewide to chip in to defray the costs of wildfires, and mandates safety protocols in the electrical grid.[3] But AB-1054 misses a smaller yet essential piece of this puzzle: Older homes, made out of materials that burn more quickly than kindling, stand in the path of wildfires that electric utilities will inevitably ignite. These homes are likely to be underinsured and completely destroyed in future fires,[4] resulting in destruction and damages that the new wildfire fund will not be able to bear.

This Note argues that wildfires in California have become uninsurable at the state, industry, and individual levels. In order to live sustainably in the new reality of a year-round wildfire season,[5] statutory solutions should move beyond shifts in liability. Massive wildfires must be prevented from turning into massive damage claims in the first place. This Note proposes that AB-1054's utility mitigation requirements be expanded past the electrical grid and into the homes of ratepayers. Utilities should be required to retrofit their lowest-income customers' homes to fire-hardened standards in high-risk areas. Fire safety measures can determine the fate of neighboring homes—when one is reduced to ashes, others may stand intact.[6] An equitable investment into effective community-wide wildfire mitigation is essential to decrease the overall costs that the state must balance among individuals, utilities, insurance companies, and the government following a destructive fire. California must ensure that the burdens of climate change do not continue to rest on the individuals who are least able to bear it.[7] This Note applies lessons from the California earthquake home-retrofitting program and utility energy-efficiency programs to argue that electric utilities are optimally situated to increase

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2. A.B. 1054, 2019 Leg., Reg. Sess. (Cal. 2019).

3. Id.

4. See Lyle Adriano, Wildfire Victims Are Largely Underinsured, Ins. Bus. Am. (Nov. 19, 2018), https://www.insurancebusinessmag.com/us/news/catastrophe/wildfire-victims-are-largely-underinsured-116580.aspx [https://perma.cc/GRM2-P6GE] ("According to the latest figures, nearly 80% of the homes affected by the wildfires were underinsured—of which 60% were severely underinsured.").

5. Cal. Bd. of Forestry & Fire Prot., 2018 Strategic Fire Plan for California 10 (2018), https://static1.squarespace.com/static/5c7d9417f4e53167c963f109/t/5c9be105eb39315a34c73bf7/1553719561181/California+Fire+Plan+2018.pdf [https://perma.cc/6D3R-QJ3B] ("Climate change has rendered the term 'fire season' obsolete, as wildfires now burn on a year-round basis across the State.").

6. See infra notes 24–25 and accompanying text.

7. See News Release, EPA, EPA Report Shows Disproportionate Impacts of Climate Change on Socially Vulnerable Populations in the United States (2021), https://www.epa.gov/newsreleases/epa-report-shows-disproportionate-impacts-climate-change-socially-vulnerable [https://perma.cc/UE3Z-KSGS] ("EPA's analysis indicates that racial and ethnic minority communities are particularly vulnerable to the greatest impacts of climate change.").

safety and security for the most vulnerable while reducing the total damages from wildfires.

This Note unfolds in three Parts. Part I introduces the wildfire crisis in California and explains its main drivers: climate change and development in the Wildland–Urban Interface (WUI). Part I also reviews the consequences of this crisis from the perspective of electric utilities, insurance companies, and wildfire resilience advocates. It concludes with a critique of the legislative effort, AB-1054, through lenses of cost-efficiency and equity. Part II describes the opportunity that AB-1054 misses to overcome the interrelated obstacles to wildfire resilience by considering the challenges of living in the WUI, conceptualized as a tragedy of the commons. To instruct mitigation in the wildfire context, Part II surveys two model environmental initiatives: (1) earthquake retrofitting under the California Brace + Bolt Program (Brace + Bolt) and (2) utility-run energy efficiency programs. Part III presents a utility-run residential fire mitigation program as a statutory solution. This Note concludes that the California Public Utilities Commission's (CPUC's) standards support the establishment of a mitigation program despite the risks of moral hazard and barriers to meaningful individual participation.

I. CALIFORNIA'S WILDFIRE EMERGENCY AND LEGISLATIVE RESPONSE

Climate change and human development in fire-prone areas have together driven the frequency and severity of California's wildfires to a crisis point.[8] Meanwhile, the state has struggled to find sustainable measures to regulate the impacts of these fires.[9] Homeowners are left unable to obtain home insurance, and insurance companies operate with heavy losses.[10] The electric utilities face massive liability from wildfire claims, jeopardizing their ability to provide reliable power, as the victims of a fire wait endlessly for recovery.[11] Still, wildfires rage on throughout the state. This Part begins by explaining the magnitude of the crisis and its far-reaching, interdependent effects and continues by demonstrating how AB-1054 falters in balancing the necessary regulations. Throughout, it emphasizes that an overarching goal of fire-mitigation efforts should be

8. See Not Just Climate Change: Study Finds Human Activity Is a Major Factor Driving Wildfires, U.C. Berkeley Dep't of Env't Sci., Pol'y, & Mgmt. (May 6, 2016), https://ourenvironment.berkeley.edu/not-just-climate-change-study-finds-human-activity-major-factor-driving-wildfires [https://perma.cc/NMD9-HVUD].

9. See infra section I.B.

10. See, e.g., Tom Jacobs & Kris Elaine Figuracion, As US Wildfire Threat Grows, Insurance Capacity Shrinks, S&P Glob. Mkt. Intel. (July 21, 2021), https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/as-us-wildfire-threat-grows-insurance-capacity-shrinks-65478993 (on file with the *Columbia Law Review*) (noting that "the [insurance] market continues to restrict capacity to cover wildfires as the events become larger and more frequent").

11. See infra notes 46–47 and accompanying text.

equity among the lowest-socioeconomic and highest-risk communities pursuing sustainable life alongside wildfires.

A. *California's Wildfire Crisis*

California's wildfire crisis has grown exponentially with almost incomprehensible results. One fire, considered alone, demonstrates the attendant devastation. The Camp Fire, which started on November 8, 2018,[12] killed eighty-five people.[13] It burned over 153,000 acres and destroyed 18,800 structures in Paradise, California, including homes, businesses, schools, and a hospital, over the course of seventeen days.[14] But the true costs of the Camp Fire went much further than the headline statistics. Ninety percent of Paradise's population abandoned the town, leaving just 2,000 people behind.[15] The residents were forced to decide whether to find housing in nearby Chico (where prices skyrocketed), join the tent city that sprung up in a Walmart parking lot, or uproot their lives by starting over somewhere new.[16] Some victims were able to utilize state and federal aid programs or cash in on insurance policies; over $12 billion in insured losses were reported.[17] Importantly, however, many homeowners were uninsured, in part due to policy drops following the 2008 Humboldt Wildfire, and found themselves stuck, hoping for legal and financial assistance to materialize.[18] Today, hazardous and toxic materials released by the Camp Fire still threaten Paradise.[19] The town's water system was compromised by

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12. Colleen Hagerty, The Survivors, Vox, https://www.vox.com/the-highlight/2019/10/16/20908291/camp-fire-wildfire-california-paradise-survivors [https://perma.cc/GTP3-K8RG] (last updated Oct. 23, 2019).

13. Dan Brekke, In Remembrance: The Names of Those Lost in the Camp Fire, KQED (June 27, 2019), https://www.kqed.org/news/11710884/list-of-those-who-died-in-butte-county-paradise-camp-fire [https://perma.cc/C7ET-A48K] (last updated Sept. 25, 2019); cf. Camille Von Kaenel, Official Camp Fire Tally Is 85 Deaths, but We Found 50 More, Mercury News (Feb. 15, 2020), https://www.mercurynews.com/2020/02/15/official-camp-fire-tally-is-85-deaths-but-we-found-50-more/ (on file with the *Columbia Law Review*) (suggesting that there were actually up to 50 more deaths and highlighting the deficiencies in official counts of fire deaths).

14. Facts + Statistics: Wildfires, Ins. Info. Inst., https://www.iii.org/fact-statistic/facts-statistics-wildfires [https://perma.cc/4TEA-XRPN] (last visited Sept. 5, 2020); Hagerty, supra note 12.

15. Hagerty, supra note 12.

16. Id.

17. Petra Löw, The Natural Disasters of 2018 in Figures, Munich RE (Jan. 8, 2019), https://www.munichre.com/topics-online/en/climate-change-and-natural-disasters/natural-disasters/the-natural-disasters-of-2018-in-figures.html [https://perma.cc/5LES-MVH3].

18. See Hagerty, supra note 14 (noting that insurance companies cancel some homeowners' insurance in the areas surrounding severe wildfires because of increased risk).

19. Tony Bizjak, Rare Toxic Cocktail From Camp Fire Is Poisoning Paradise Water. It Could Cost $300 Million to Fix., Sacramento Bee (Apr. 18, 2019), https://account.sacbee.com/paywall/stop?resume=228969259 (on file with the *Columbia Law Review*) (last updated June 16, 2019).

a carcinogenic compound,[20] and severe respiratory illnesses are projected to continue rising rapidly in coming years.[21] The personal impacts will, of course, be felt for generations. Losses of family members, friends, livelihoods, and communities cannot be quantified.

The Camp Fire's effects were not felt equally. In the aftermath, remnants of completely incinerated homes lay next to fully intact homes, damaged only by the smoke.[22] A building code explains the incongruity. In 2008, California adopted fire-safe building code standards (Chapter 7A of the California Building Code), which mandate ignition-resistant materials in construction and prescribe vegetation management practices.[23] Compliance with Chapter 7A is the key to a home's survivability and the extent of the resulting costs on insurers, utilities, and its residents.[24] Of the homes in the path of the Camp Fire, over 80% of the homes built before 2008 suffered damage while the majority of homes built after 2008 were undamaged.[25]

Megafires like the Camp Fire are no longer anomalies nor unprecedented. In 2018, there were almost 8,000 fires in California, burning over 1,975,000 acres and surpassing records of destructiveness set only the year before.[26] The broader trend of more frequent and bigger fires is set to intensify as illustrated by the four million acres burned in 2020—more than doubling the previous record.[27] To protect more families and homes as this calamitous rise continues, lessons must be learned from what remained standing in the ashes.

1. *Climate Change.* — Our warming climate directly drives the increase in wildfire activity. When air heats up, even by a fraction of a degree,

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20. Id.

21. Robin Epley, Camp Fire's Effects on Air Quality Will Be Felt for Decades, Daily Democrat (July 14, 2019), https://www.dailydemocrat.com/2019/07/14/inhaled-were-years-if-not-decades-from-being-fully-away-from-the-effects-of-the-fire (on file with the *Columbia Law Review*) (last updated July 15, 2019).

22. See supra note 13 and accompanying text.

23. Cal. Bldg. Code § 701A (2016).

24. See Headwaters Econ., Building a Wildfire-Resistant Home: Codes and Costs 9 (2018), https://headwaterseconomics.org/wp-content/uploads/building-costs-codes-report.pdf [https://perma.cc/T3HD-4ZPM] ("Although the factors affecting whether a home survives a wildfire are complex—including weather, topography, fuels, and fire suppression capabilities—empirical research and laboratory experiments have demonstrated that building construction and design play a major role in home survival.").

25. Dale Kasler & Phillip Reese, 'The Weakest Link': Why Your House May Burn While Your Neighbor's Survives the Next Wildfire, Sacramento Bee (Apr. 11, 2019), https://www.sacbee.com/news/california/fires/article227665284.html (on file with the *Columbia Law Review*) (last updated Nov. 5, 2019).

26. CAL FIRE, 2018 Incident Archive, CA.gov, https://www.fire.ca.gov/incidents/2018 [https://perma.cc/NCK3-LKS2] (last visited Oct. 17, 2020).

27. See Kasha Patel, Rising Global Temperatures Influence California's Fire Season, Earth Observatory (Sept. 3, 2019), https://earthobservatory.nasa.gov/images/145534/rising-global-temperatures-influence-californias-fire-season [https://perma.cc/XM2N-FCXF]; 2020 Archive, supra note 1.

moisture evaporates from soils and vegetation, causing fires to spark more easily, burn longer, and spread further and faster.[28] California exemplifies this clear cause-and-effect relationship. Since 1980, temperatures statewide have risen more than two degrees Fahrenheit while precipitation rates have dropped by 30%.[29] The acreage burned annually has increased fivefold, hallmarked by the catastrophic destruction in the 2017 and 2018 wildfires.[30] To close the negative feedback loop, wildfires release large amounts of carbon dioxide, a key greenhouse gas that warms the atmosphere and poses a significant challenge in the fight against climate change.[31]

2. *Development in the Wildland–Urban Interface.* — Human development and settlement in the WUI work in concert with climate change to raise the costs of California's wildfires. Areas where human-made structures and infrastructure overlap with undeveloped land and vegetation, prone to wildfires, comprise the WUI.[32] Drawn by access to nature, recreation, and an escape from the housing crisis in urban areas, almost 30% of Californians have made the WUI their home.[33] These 4.5 million homes in California are not alone—the WUI is the "fastest-growing land use type"

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28. Although the interaction of many variables can promote wildfires (including natural climate cycles, vegetation cover, development patterns, and fuel buildup), the increased heat, drought, and insect outbreaks caused by climate change are the most impactful. See e.g., Kevin Krajick, Study Bolsters Case that Climate Change Is Driving Many California Wildfires, State of the Planet (July 15, 2019), https://blogs.ei.columbia.edu/2019/07/15/study-bolsters-case-that-warming-climate-is-driving-many-california-wildfires [https://perma.cc/SM3X-URXX]; see also Thomas Fuller & Christopher Flavelle, A Climate Reckoning in Fire-Stricken California, N.Y. Times (Sept. 10, 2020), https://www.nytimes.com/2020/09/10/us/climate-change-california-wildfires.html (on file with the *Columbia Law Review*) (last updated Oct. 27, 2020) ("Climate scientists say the mechanism driving the wildfire crisis is straightforward: Human behavior, chiefly the burning of fossil fuels like coal and oil, has released greenhouse gases that increase temperatures, desiccating forests and priming them to burn.").

29. Rob Jordan, Stanford Researchers Forecast Longer, More Extreme Wildfire Seasons, Stan. News (Apr. 2, 2020), https://news.stanford.edu/2020/04/02/increasing-risk-extreme-wildfire-weather/ [https://perma.cc/Q6SV-2H4B].

30. Krajick, supra note 28.

31. See News Release 07-163, Nat'l Sci. Found., U.S. Fires Release Enormous Amounts of Carbon Dioxide (Oct. 31, 2007), https://www.nsf.gov/news/news_summ.jsp?cntn_id=110580 [https://perma.cc/4WYZ-DMTH] ("A striking implication of very large wildfires is that a severe fire season lasting only one or two months can release as much carbon as the annual emissions from the entire transportation or energy sector of an individual state." (quoting Christine Wiedinmyer & Jason C. Neff, Estimates of CO2 From Fires in the United States: Implications for Carbon Management, 2 Carbon Balance & Mgmt. 10, 17 (2007)).

32. What Is the WUI?, U.S. Fire Admin., https://www.usfa.fema.gov/wui/what-is-the-wui.html [https://perma.cc/FB6J-TE66] (last visited Feb. 23, 2022).

33. Alice Hill & William Kakenmaster, "A New Normal": California's Increasing Wildfire Risk and What to Do About It, Hoover Inst. (May 24, 2018), https://www.hoover.org/research/new-normal-californias-increasing-wildfire-risk-and-what-do-about-it [https://perma.cc/SSQ7-FUHT].

nationwide, and it is where 60% of all new home construction between 1990 and 2016 occurred.[34]

Humans spark 95% of fires in California.[35] Fires caused by people are concentrated near the infrastructure that is necessary to support life and business in the WUI.[36] The structures themselves provide fodder for the fires because certain building materials ignite more easily and burn both hotter and longer than natural fuels such as vegetation.[37] Further, development and social constraints inhibit controlled burns, an effective fire suppression strategy, allowing natural fuel to accumulate.[38] Fighting fires in the WUI requires additional resources to protect inaccessible structures, costing firefighters thirty-times more than comparable fires on undeveloped land.[39] Buildings and homes threatened by fire must be evacuated in a disruptive process that disproportionately burdens elderly

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34. Id.

35. Isabella Isaacs-Thomas, California's Catastrophic Wildfires in 3 Charts, PBS (Sept. 14, 2020), https://www.pbs.org/newshour/science/californias-catastrophic-wildfires-in-3-charts [https://perma.cc/H6QW-FFP2]; see also Alexandra D. Syphard, Volker C. Radeloff, Jon E. Keeley, Todd J. Hawbaker, Murray K. Clayton, Susan I. Stewart & Roger B. Hammer, Human Influence on California Fire Regimes, 17 Ecological Applications 1338, 1390, 1396–99 (2007) ("Although both anthropogenic and lightning ignitions would be important to consider for fully understanding fire patterns in other regions, humans were responsible for ~95% of both the number of fires and area burned in California in the last century." (citation omitted)).

36. See Heather Anu Kramer, Miranda H. Mockrin, Patricia M. Alexandre & Volker C. Radeloff, High Wildfire Damage in Interface Communities in California, 28 Int'l J. Wildland Fire 641, 646–47 (2019) ("Interface WUI areas accounted for the majority of building destruction in California wildfires that destroyed at least one building.").

37. Dupont, ISET Int'l & Zurich N. Am., California Fires: Building Resilience From the Ashes 12 (2019), https://www.zurichna.com/-/media/project/zwp/zna/docs/kh/wildfire/california-wildfire-report.pdf?la=en&hash=AB77A5B3CFC40E2C50ADB7F728728001&hash=AB77A5B3CFC40E2C50ADB7F728728001 [https://perma.cc/9WUY-X4AA] ("Because structures contain synthetic or petroleum-based materials . . . they can burn hotter and longer, and generate larger embers.").

38. See Paulo M. Fernandes & Hermínio S. Botelho, A Review of Prescribed Burning Effectiveness in Fire Hazard Reduction, 12 Int'l J. Wildland Fire 117, 121 (2003) ("Fires occurring in fuel-reduced areas . . . tend to be smaller, less damaging to trees, and lower in fire suppression expenditures.").

39. See Bay City News, Wildland Development Escalates California Fire Costs, KQED (Dec. 18, 2018), https://www.kqed.org/news/11713393/wildland-development-escalates-california-fire-costs [https://perma.cc/6H59-UGFN] ("Fighting fires in the WUI costs $1,695 per acre, according to a 2015 Forest Service audit that examined several WUI fires from 2008 to 2010. That's more than twice the cost of putting out fires in a forest, and nearly 30 times the cost of fighting fire in undeveloped grassland or shrubbery."); see also Ross Gorte, Headwaters Econ., The Rising Cost of Wildfire Protection 7–8 (2013), https://headwaterseconomics.org/wp-content/uploads/fire-costs-background-report.pdf [https://perma.cc/3HRE-2AXF] ("[S]tructures . . . can significantly alter fire control strategies and raise costs, because protecting structures commonly requires additional, special firebreaks and because fire managers often rely on expensive aircraft to drop fire retardant on and around the structures.").

and disabled people.[40] Therefore, when a fire inevitably starts in the WUI, it is more dangerous, more difficult, and more costly to put out.[41] Despite this reality, new development continues expanding in the WUI. Wildfire safety requirements are enforced haphazardly and building density has grown to the point that houses are "stacked so close together, they're like sticks in a fireplace."[42]

3. *Electric Utilities.* — California's electric utilities have an obligation to provide reliable access to electricity to homes and businesses throughout the WUI,[43] even to those buildings located in remote areas where fire danger is highest and provision of this public service is the most hazardous.[44] The WUI comprises many high-risk areas serviced by electric utilities that are characterized by tinder-dry vegetation and "strong winds, low humidity and warm temperatures," as well as outdated and poorly maintained electricity lines.[45] Operating in the WUI presents a daunting problem for electric utilities, since "the conditions that cause power lines to start wildfires are the exact same conditions that make them spread rapidly and make them hard to contain."[46] Despite being vastly

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40. See e.g., Jill Tucker, Michael Cabanatuan & Ashley McBride, Tragic but Familiar Narrative in Camp Fire: Most Victims Were Older, Disabled, SFGate (Dec. 9, 2018), https://www.sfgate.com/california-wildfires/article/Camp-Fire-victims-13450654.php (on file with the *Columbia Law Review*) (last updated Dec. 11, 2018) (noting the disproportionate number of disabled, elderly, and infirm victims in the Camp Fire and explanatory factors such as lack of cognitive understanding of the danger, inability to independently escape due to physical limitations, and lack of cell phone or emergency alert access).

41. See Off. of Inspector Gen., W. Region, USDA, Audit Report: Forest Service Large Fire Suppression Costs, Report No. 08601-44-SF, at i (2006), https://www.fs.usda.gov/sites/default/files/media_wysiwyg/fs_large_fire_suppression_costs_oig_audit_final_report_11-20-06.pdf [https://perma.cc/GE2Q-TBVU] (noting that "[Forest Service's] escalating cost to fight fires is largely due to its efforts to protect private property in the wildland urban interface").

42. See Kasler & Reese, supra note 25 (quoting Dave Sapsis, a CAL FIRE wildland fire scientist).

43. Cal. Pub. Util. Code § 454 (2019) (setting forth electric utilities' "obligation to serve its customers at just and reasonable rates").

44. For example, tree trimming is one small cost of electricity provision in forested areas. Utility companies struggle to hire enough trimmers to clear the lines and maintain the grid due to the rising cost of insurance and massive potential liabilities from trimming accidents. See Lauren Hepler, California's Latest Wildfire Problem: Insuring the Tree Trimmers, N.Y. Times (Sept. 29, 2019), https://www.nytimes.com/2019/09/29/business/california-fire-insurance.html (on file with the *Columbia Law Review*) ("To work for PG&E, contractors must agree to absorb the liability for any lawsuits over death, injuries or property damage—during or after the fact—in areas where they work.").

45. News Release, California Dep't of Forestry & Fire Prot., CAL FIRE Investigators Determine Cause of the Camp Fire, CAL FIRE (May 15, 2019), https://www.fire.ca.gov/media/5121/campfire_cause.pdf [https://perma.cc/V2VK-NV6G]; see also 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), https://www.wsj.com/articles/pg-e-knew-for-years-its-lines-could-spark-wildfires-and-didnt-fix-them-11562768885 (on file with the *Columbia Law Review*).

46. Carolyn Kousky, Katherine Greig, Brett Lingle & Howard Kunreuther, Wildfire Costs in California: The Role of Electric Utilities, Wharton Risk Mgmt. & Decision Processes

outnumbered by fires started by people,[47] utility-caused fires tend to be the most destructive and thus the most expensive.[48] For instance, a 100-year-old Pacific Gas and Electric Company (PG&E) transmission tower in rural Paradise, faulty electrical distribution lines, and climate conditions joined forces to spark the devastating Camp Fire.[49] The resultant firestorm, marked by extreme spread and intensity, burned at a rate of eighty football fields per minute.[50] Faced with astronomical expected liability from this fire, PG&E filed for bankruptcy.[51] Multibillion-dollar wildfire liabilities like the Camp Fire continue to threaten the financial viability of California's utilities and access to safe, reliable, and affordable electricity for the state's residents.[52]

California electric utilities are uniquely susceptible to catastrophic losses from wildfires because of the doctrine of inverse condemnation.[53] Inverse condemnation entitles property owners to just compensation if their property is damaged by or taken for a public use in order to spread any individual losses arising from a public undertaking throughout the community that benefits from the public service.[54] Under the assumption that a utility could raise rates to redistribute costs among its ratepayers who

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Ctr. 3 (2018), https://riskcenter.wharton.upenn.edu/wp-content/uploads/2018/08/Wildfire-Cost-in-CA-Role-of-Utilities-1.pdf [https://perma.cc/24MW-YDDK] ("[W]hen [utility-caused] fires start, they are larger . . . because the probability of ignition from a power line increases with wind speed. Greater wind speed means conditions more favorable to the spread of wildfire, conditions where suppression is less effective, and conditions in which firefighters are likely to be spread thin.").

47. California's three largest investor-owned utilities sparked more than 2,000 fires in the past four years, accounting for around 5% of the state's ignitions. See Governor Newsom's Strike Force, Wildfires and Climate Change: California's Energy Future 2 (2019), https://www.gov.ca.gov/wp-content/uploads/2019/04/Wildfires-and-Climate-Change-California's-Energy-Future.pdf [https://perma.cc/83ML-6DT2] [hereinafter Strike Force].

48. See Kousky et al., supra note 46, at 3.

49. Blunt & Gold, supra note 45.

50. CNN Wire, Walls of Flames Sweep Through Northern California at About 80 Football Fields Per Minute, Fox 8 (Nov. 9, 2018), https://myfox8.com/news/walls-of-flames-sweep-through-northern-california-at-about-80-football-fields-per-minute [https://perma.cc/FFQ9-FCEL].

51. Ivan Penn, Lauren Hepler & Peter Eavis, PG&E Reaches $13.5 Billion Deal With Wildfire Victims, N.Y. Times (Dec. 6, 2019), https://www.nytimes.com/2019/12/06/business/energy-environment/pge-wildfire-victims-deal.html (on file with the *Columbia Law Review*).

52. See Strike Force, supra note 47, at 3.

53. Id. at 30; Cal. Const. art. I, § 19(a).

54. Albers v. County of Los Angeles, 398 P.2d 129, 137 (1965) (holding that, under inverse condemnation, a property owner may recover just compensation from a public entity for "any actual physical injury to real property proximately caused by [a public] improvement as deliberately designed and constructed . . . whether foreseeable or not"). "Public Utilities Code section 612 provides, 'An electrical corporation may condemn any property necessary for the construction and maintenance of its electric plant.' . . . Therefore, generally, condemning private property for the transmission of electrical power is a public use and inverse condemnation will apply." Barham v. S. Cal. Edison Co., 88 Cal. Rptr. 2d 424, 429–30 (1999) (quoting Cal. Pub. Util. Code § 612 (1975)).

benefit from its service, California courts extend inverse condemnation to California's private, investor-owned utilities.[55] Thus when a utility's equipment sparks a fire, the utility is strictly liable to property owners for damages regardless of negligence or fault.[56]

This legal framework is no longer sustainable. Wildfire liabilities have risen extraordinarily and outpaced utility liability insurance. Rate increases, subject to the approval of the CPUC, have been denied to protect ratepayers.[57] Credit-rating downgrades threaten electric utilities' access to capital, desperately needed to make safety improvements while keeping customers' rates reasonable.[58] For example, in March 2019, Moody's downgraded San Diego Gas & Electric's (SDG&E's) credit rating to Baa1, just a few notches above junk status, with an ultimatum to downgrade further if no regulatory changes were made.[59] In response to their precarious position, utilities have inconsistently attempted wildfire mitigation and safety practices. Most notably, several utilities regularly enact controversial public safety power shut-offs in which utilities de-energize their lines when fire risk is high to relatively little avail.[60] As the

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55. The justification for inverse condemnation is that the government should not force "some people alone to bear public burdens which, in all fairness and justice, should be borne by the public as a whole." Armstrong v. United States, 364 U.S. 40, 49 (1960). Instead, public entities are forced to swallow the liability so that individual losses arising from a public undertaking are distributed throughout the benefitted community. See Samir A. Hafez, Jr., Heated Conflict: Investor-Owned Utility Liability for California Wildfires Under the Doctrine of Inverse Condemnation, 11 San Diego J. Climate & Energy L. 25, 28 (2020).

56. See Kousky et al., supra note 46, at 6.

57. Ultimately, the CPUC's rate approval decisions are subject to court review. San Diego Gas & Electric's (SDG&E's) case provides an example. The CPUC rejected SDG&E's request to pass $379 million in costs from wildfire liabilities onto its ratepayers because it failed to meet its burden that its system management and response to wildfires was reasonable. Decision Denying Application at 63, Application of San Diego Gas & Electric Company (U902E) for Authorization to Recover Costs Related to the 2007 Southern California Wildfires Recorded in the Wildfire Expense Memorandum Account (WEMA), No-17-11-033 (Cal. Pub. Utils. Comm'n Nov. 30, 2017), 2017 WL 11619529. The Supreme Court then rejected the utility's petition for review. Rob Nikolewski, Supreme Court Rejects SDG&E Appeal on Who Pays for Wildfire Costs, L.A. Times (Oct. 7, 2019), https://www.latimes.com/business/story/2019-10-07/supreme-court-rejects-sdge-appeal-on-wildfire-costs (on file with the *Columbia Law Review*).

58. See Strike Force, supra note 47, at 3.

59. See Nephele Kirong, Moody's Downgrades SDG&E on Wildfire Liability-Related Risks, S&P Glob. Mkt. Intel. (Mar. 8, 2019), https://www.spglobal.com/marketintelligence/en/news-insights/trending/yML692tZ1Y1Tug-zHVshdg2 [https://perma.cc/BL2C-5HZR].

60. Public Safety Power Shutoff (PSPS) / De-Energization, Cal. Pub. Utils. Comm'n, https://www.cpuc.ca.gov/deenergization [https://perma.cc/9R4B-UNB6] (last visited Mar. 19, 2022). The CPUC authorizes PSPS as a preventative measure of last resort if "the utility reasonably believes that there is an imminent and significant risk that strong winds may topple power lines or cause major vegetation-related issues leading to increased risk of fire." Id. These shutoffs are met with major public backlash—many people lose power without notice, businesses and schools are forced to close, and those with serious medical conditions are endangered. See Ivan Penn, 'This Is Not Hard': PG&E Gets an Earful Over

costs of wildfires continue to grow, the existing statutory framework must be reworked to establish electric utilities as meaningful participants in the fight against wildfires, rather than solely defining their role as liability bearers in the aftermath of a fire.

4. *Insurance "Protection Gap".* — In an effort to remain financially viable in the face of huge losses from wildfires, insurance companies have refused to renew some homeowners' insurance policies following a fire or after an area is deemed high risk.[61] Other homeowners face prohibitively expensive policies, making insurance increasingly difficult to obtain and retain.[62] The "protection gap," the amount of damages from a wildfire that are not insured, [63] is growing to the detriment of both the insured and the insurers.[64]

Homeowners simply lack options. Of the homes affected by the 2017 wildfires, 80% were underinsured, and those homeowners found themselves unable to cover their losses or replace their homes.[65] Lacking recourse with private insurers, an increasing number of Californians have turned to the California Fair Access to Insurance (FAIR) Plan.[66] The FAIR

Its Blackout, N.Y. Times (Oct. 18, 2019), https://www.nytimes.com/2019/10/18/business/energy-environment/pge-blackout-california.html (on file with the *Columbia Law Review*).

61. See Don Jergler, California Commissioner Calls for Statewide Non-Renewal Moratorium, More Measures to Protect Wildfire Victims, Ins. J. (Dec. 5, 2019), https://www.insurancejournal.com/news/west/2019/12/05/550413.htm [https://perma.cc/JQV4-79K7] (noting a 10% increase in policy non-renewals over the course of a year and rates up to three times higher). Although California's insurance commissioner has banned insurers from dropping policies in areas hit by fires (state-of-emergency disaster areas), the ban expired in December 2020 and was not renewed. See Christopher Flavelle, As Wildfires Rage, California Presses Insurers to Cut Rates, N.Y. Times (Sept. 16, 2020), https://www.nytimes.com/2020/09/16/climate/california-home-insurance-crisis.html (on file with the *Columbia Law Review*) [hereinafter Flavelle, As Wildfires Rage].

62. See Jergler, supra note 61 (noting evidence that Californians increasingly struggle to obtain homeowners insurance in traditional markets and are forced into "more expensive, less comprehensive options").

63. See, e.g., Guy Carpenter, Protecting Our Planet and the Public Purse: How Governments Are Accessing Private Capital to Enhance Climate Resilience 23 (2020), https://www.guycarp.com/content/dam/guycarp-rebrand/pdf/final_2020_March_Protecting_our_Planet_and_the_Public_Purse_Publish.pdf (on file with the *Columbia Law Review*) (noting that the growth of the protection gap is not unique to California wildfires as nations worldwide are bearing an increasing share of climate costs, particularly in developing countries where insurance is less prevalent).

64. In the Camp Fire, for example, the economic losses were estimated to be over $16 billion while insurance covered around $12 billion of those losses. See Löw, supra note 17.

65. Sixty percent of those affected plan to sue their insurance agents, brokers, or both for being underinsured. Adriano, supra note 4.

66. The FAIR Plan is an insurance pool, funded by required contributions from private insurance companies, that is intended to ensure the availability of basic property insurance for people who have been unable to obtain insurance in the private market through no fault of their own. About FAIR Plan, Cal. FAIR Plan Prop. Ins., https://www.cfpnet.com/about-fair-plan/ [https://perma.cc/DG4S-PTDJ] (last visited Feb. 23, 2022). The number of FAIR policies for homes in high-fire-risk areas has risen by 50% in the past five years. Strike Force, supra note 47, at 35.

Plan provides state-mandated insurance of "last resort."[67] Unlike private insurance policies, which are subject to regulatory limits, FAIR Plan policies are priced to reflect a home's true risk of wildfires. Never intended to replace large portions of the private homeowner insurance market, premiums can be two to three times higher, while coverage is extremely limited and often insufficient, providing protection only for "dwellings"[68] from "named perils"[69] of fire and smoke. The California Department of Insurance raised coverage limits and broadened the scope of FAIR Plan policies, also placing mandatory one-year moratoriums on nonrenewal of policyholders in wildfire disaster areas.[70] So far, however, these band-aid measures have not effectively reduced the protection gap for California homeowners, and FAIR plan policyholders faced yet another price increase in 2021.[71]

Across the industry, insurance companies are overwhelmed by the costs of wildfires.[72] The wildfires of 2017 and 2018 alone "wiped out a full quarter-century of the industry's profits."[73] Insurance companies are left in a difficult position. On the one hand, for insurance companies, "not covering high-risk homes reflects a straightforward logic: 'Why am I

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67. Christopher Flavelle, As Disasters Worsen, California Looks at Curbing Construction in Risky Areas, N.Y. Times (June 4, 2021), https://www.nytimes.com/2021/06/04/climate/climate-California-wildfires-insurance.html (on file with the *Columbia Law Review*) (last updated Aug. 6, 2021).

68. Dwelling Policy, Cal. FAIR Plan Prop. Ins., https://www.cfpnet.com/index.php/consumers/dwelling-policy [https://perma.cc/5ZFK-E89K] (last visited Dec. 18, 2020).

69. See Maxime Croll, How Does California FAIR Plan Insurance Work?, ValuePenguin, https://www.valuepenguin.com/california-fair-plan-home-insurance [https://perma.cc/6TSB-9NPZ] (last updated July 28, 2021).

70. In 2019, Insurance Commissioner Ricardo Lara mandated that the FAIR Plan raise the coverage limit from $1.5 million to $3 million and offer comprehensive coverage comparable to traditional homeowner insurance. The California FAIR Plan responded to this unpopular move with a lawsuit, arguing that Lara exceeded his authority and the FAIR plan's statutory mandate. The Los Angeles Superior Court issued a preliminary injunction in February 2020. See Tom Jacobs, Court Issues Preliminary Injunction Halting Changes to California's FAIR Plan, S&P Glob. Mkt. Intel. (Feb. 20, 2020), https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/court-issues-preliminary-injunction-halting-changes-to-california-s-fair-plan-57180502 [https://perma.cc/P63E-63NR].

71. See John Orona, FAIR Plan Fire Insurance Rates to Increase Next Year, Union (Dec. 17, 2020), https://www.theunion.com/news/fair-plan-fire-insurance-rates-to-increase-next-year [https://perma.cc/54D7-LY59]; Dan Walters, Opinion, Walters: California's Legislature Ignores Fire Insurance Crisis, Mercury News (Sept. 8, 2020), https://www.mercurynews.com/2020/09/08/walters-californias-legislature-ignores-fire-insurance-crisis (on file with the *Columbia Law Review*).

72. See Christopher Flavelle & Brad Plumer, California Bans Insurers From Dropping Policies Made Riskier by Climate Change, N.Y. Times (Dec. 5, 2019), https://www.nytimes.com/2019/12/05/climate/california-fire-insurance-climate.html (on file with the *Columbia Law Review)* ("In a survey of 27 state insurance regulators this year, the consulting firm Deloitte found that just four states said their insurers were 'fully' or 'largely' prepared to respond to the risks of climate change.").

73. Id.

insuring something that I know is going to be destroyed?'"[74] On the other hand, state mandates require insurance companies to provide coverage, and regulators often reject insurers' attempts to pass the costs onto customers through increased rates.[75] Increased rates may stave off bankruptcy for insurance companies and send appropriate signals about the level of climate-related risks, but they further restrict access to affordable and sufficient insurance for many Californians. Moreover, as obtaining a residential mortgage requires proof of home insurance, higher insurance rates have a cooling effect on real estate markets and property tax bases, making homes less valuable and harder to sell.[76]

The current attitudes and approaches toward managing losses from wildfires in California are unsustainable. Shifting liability and costs between ratepayers, utilities, and insurance companies may temporarily alleviate the respective burden on each group, but the fundamental issues that create the high costs remain. To address the root problems, prevention and mitigation measures must be implemented so that insurers can offer vital protection in the WUI and victims of wildfires can be made whole. Though animosity toward insurance companies is understandably prevalent among homeowners in the WUI,[77] the government of California is unable to bear the ever-increasing burden of disaster relief without a functioning insurance market.[78] The broken California fire-insurance system presents a conundrum: How can insurance companies afford to do business in fire-prone areas at reasonable rates?[79]

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74. Christopher Flavelle, Wildfires Hasten Another Climate Crisis: Homeowners Who Can't Get Insurance, N.Y. Times (Sept. 2, 2020), https://www.nytimes.com/2020/09/02/climate/wildfires-insurance.html (on file with the *Columbia Law Review*) [hereinafter Flavelle, Homeowners Who Can't Get Insurance] (last updated Sept. 10, 2020) (quoting Professor Char Miller).

75. See Flavelle & Plumer, supra note 72 ("For insurance companies, the most obvious response is to pass the costs on to customers in the form of higher prices . . . [but California] forbids insurance companies from setting rates based on what they expect in future damages.").

76. See Flavelle & Plumer, supra note 72.

77. See Ed Leefeldt, After Wildfires, Hundreds of Thousands of Californians Can't Get Insurance, CBS News (Aug. 30, 2019), https://www.cbsnews.com/news/wildfires-california-homeowners-insurance-hard-to-find-due-to-magnitude-of-massive-wildfires [https://perma.cc/6NTL-YS8V] ("Consumers say insurers are 'holding us hostage,' noting that people can't get a mortgage without home insurance.").

78. See Shelby D. Green, Building Resilient Communities in the Wake of Climate Change While Keeping Affordable Housing Safe From Sea Changes in Nature and Policy, 54 Washburn L.J. 527, 535 (2015) ("The nation's fiscal status is burdened when the federal government has to provide . . . protection from wildfires. These efforts will cause 'budgetary pressures' . . . making it 'more challenging to invest in growth, meet the needs of an aging population, and provide for our national defense.'" (footnote omitted) (quoting Jacob J. Lew, Sec'y, U.S. Treas. Dep't, Remarks on the Economics of Climate Change Hosted by the Hamilton Project at Brookings (Sept. 22, 2014), https://home.treasury.gov/news/press-releases/jl2646 [https://perma.cc/6AZ9-5Y9F])).

79. See Flavelle, As Wildfires Rage, supra note 61 ("Many of California's insurers are already losing money in fire-prone areas. 'How is the insurance industry going to justify to

5. *Wildfire Mitigation.* — Prevention and mitigation efforts are the linchpin to increase the survivability of homes and thereby reduce the costs of California's wildfires. As seen in the Camp Fire, home survivability depends on compliance with Chapter 7A of California's building code, "Materials and Construction Methods for Exterior Wildfire Exposure."[80] The code focuses on the two primary sources of homes' vulnerability: (1) vegetation management in the space directly around a home and (2) the use of fire-resistant building materials.[81] However, Chapter 7A only applies to "high" fire hazard severity zones, "very high" fire hazard severity zones, and new construction.[82] Constructing a wildfire-resistant home costs roughly the same as building a typical home.[83] Conversely, the cost of retrofitting the roof and exterior walls of a vulnerable home with wildfire-resistant materials can exceed $60,000.[84] Funding constraints have stymied California's legislative reform attempts to help homeowners implement fire-resistant materials in their homes and to enforce fire-safe vegetation standards around structures.[85] In the long run, the benefits of wildfire-

its shareholders or to its members that this is a good place to do business?'" (quoting Nancy P. Watkins, a senior actuary at a consulting firm)).

80. See supra notes 23–25 and accompanying text.

81. Cal. Bldg. Code § 701A (2016).

82. See Frequently Asked Questions About: Fire Hazard Severity Zoning and New Building Codes for California's Wildland-Urban Interface, Cal. Dep't of Forestry & Fire Prot. (2007), https://www.sccgov.org/sites/dpd/DocsForms/Documents/FIRE_CAL_WUI_FAQs.pdf [https://perma.cc/2SWR-VRSU] ("California law requires CAL FIRE to identify areas based on the severity of fire hazard that is expected to prevail there. These areas, or 'zones,' are based on factors such as fuel (material that can burn), slope and fire weather."). However, the fire hazard designations do not guarantee that the codes will be applicable or enforceable in the highest-risk areas. Local governments have the discretion to reject a CAL FIRE designation, and some city councils do so out of fear of inflating construction costs or discouraging development. Risk maps are still in the process of being updated, and new developments are able to evade restrictions. Enforcement of defensible space requirements has not been consistent, and homeowners incur no penalties for noncompliance. See John Branch & Brad Plumer, Climate Disruption Is Now Locked In. The Next Moves Will Be Crucial., N.Y. Times (Sept. 22, 2020), https://www.nytimes.com/2020/09/22/climate/climate-change-future.html (on file with the *Columbia Law Review*) (last updated Oct. 7, 2021) (describing the moral hazard problem in opposition to stricter building codes when "local communities reap increased property taxes from allowing buildings to rise in disaster-prone areas, but they don't pick up most of the tab for disaster recovery—the federal government does"); see also Headwaters Econ., supra note 24.

83. See Headwaters Econ., supra note 24, at 24.

84. See id. at 26. Retrofitting can be done more economically, however, by prioritizing vulnerable parts of the house. For instance, replacing some of the riskiest parts of a roof can be done for as low as $370. Id. at 33.

85. See Lauren Sommer, These Big Plans to Protect California Homes From Wildfire Fell Short in the Legislature, KQED (Sept. 26, 2019), https://www.kqed.org/science/1948013/california-lawmakers-plans-to-protect-homes-from-wildfire-fall-short [https://perma.cc/9KFS-X8FC] (describing several bills drafted to help homeowners in "high fire-risk areas retrofit their homes with fire-resistant materials"). For instance, Assembly Bill 38 sought to provide interest-free or low-interest loans for existing home retrofits in vulnerable communities, but when funding was not prioritized in the state budget, the bill was limited. Id.; see also A.B. 38, 2019 Leg., Reg. Sess. (Cal. 2019).

resistant construction to communities and individuals far outweigh the costs.[86] In the short term, however, the costs of retrofitting existing structures is insurmountable for many individuals and the state as a whole. Thus, shake roofs and overgrown vegetation, effectively kindling, still dot the WUI—at least until they are destroyed in the next fire.

B. *The California Legislature's Response to the Wildfire Crisis*

The California Legislature has struggled to find a sustainable solution to the state's problem of wildfires that balances the diverging interests of homeowners, utilities, and insurance companies. AB-1054 is a recent, ambitious attempt at this balancing act. AB-1054 steps forward by reallocating liability, but the bill overlooks an ideal opportunity to create fire resiliency in the most vulnerable communities. This section explains how AB-1054 functions, evaluates its impact on wildfires and the affected actors, and highlights the need for more equitable responses to climate-change-related disasters.

1. *Assembly Bill 1054.* — AB-1054 was signed by Governor Gavin Newsom on July 12, 2019, and passed as an urgency statute, taking immediate effect.[87] The statute has five goals: (1) stabilizing the finances of electric utilities by removing uncertainty about the impact of future fires, (2) facilitating the recovery of wildfire victims, (3) protecting electricity ratepayers from extreme rate increases and loss of electricity, (4) making utilities responsible to their shareholders for safe operations, and (5) reducing the risk of future fires.[88]

AB-1054 altered the utility liability structure by creating a twenty-one-billion-dollar Wildfire Liability Fund to reimburse Californians harmed by utility-caused wildfires.[89] Participating utilities provide half of the necessary capital through proportional initial contributions. The CPUC calculates these contributions and corresponding annual fees based on the percentage of a utility's service area that is deemed to be at high risk of fires (the Wildfire Allocation Metric).[90] Ratepayers statewide provide the remaining

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86. See, e.g., Nat'l Inst. of Bldg. Scis., Natural Hazard Mitigation Saves: 2017 Interim Report 1 (2017), https://www.wbdg.org/files/pdfs/MS2_2017Interim%20Report.pdf [https://perma.cc/YVM7-P37N] ("Mitigation represents a sound financial investment. . . . [S]ociety saves $6 for every $1 spent through mitigation grants . . . .").

87. A.B. 1054, 2019 Leg., Reg. Sess. (Cal. 2019).

88. Cf. Strike Force, supra note 47, at 7.

89. Cal. Pub. Util. Code § 1701.8(a)(1) (2019) (noting that "'[c]overed wildfire' means any wildfire ignited on or after July 12, 2019, [caused by] an electrical corporation" as determined by the "governmental agency responsible for determining causation"); Rob Nikolewski, California Regulators Approve Funding for Controversial Wildfire Law, San Diego Union-Trib. (Oct. 24, 2019), https://www.sandiegouniontribune.com/business/energy-green/story/2019-10-24/california-regulators-approve-funding-for-controversial-wildfire-law [https://perma.cc/MEC4-GGXK] [hereinafter Nikolewski, California Regulators].

90. The metric allocates 64.2% to Pacific Gas & Electric Company, 31.5% to Southern California Edison Company, and 4.3% to San Diego Gas & Electric Company. Cal. Pub. Util. Code § 3280(n) (2022); see also Nossaman LLP, Landmark Legislation Creates New

half of the money for the Wildfire Liability Fund through a $2.50 monthly surcharge on electricity bills.[91] In order to access the fund after it is deemed to have caused a fire, a utility must have a "safety certification" from the newly established California Wildfire Safety Advisory Board.[92] To receive a safety certification, the utility must meet certain requirements, including establishing a safety committee, tying executive compensation to safety performance, and implementing approved wildfire mitigation plans.[93]

Prior to AB-1054, a utility had to demonstrate that it acted reasonably before the CPUC would approve a rate increase to cover the wildfire liability it incurred.[94] Now, under AB-1054, if a utility has a valid certification for the time period in which a wildfire occurred, the CPUC presumes that the utility acted reasonably, and the burden shifts to the objecting party to demonstrate serious doubt that the utility's conduct was reasonable.[95] AB-1054 supplants the inverse-condemnation doctrine by allowing utilities to avoid strict liability by prudently investing in preventative safety measures.

AB-1054's alteration of the liability structure sends appropriate signals about how states must respond to climate change: Utilities can no longer be held completely responsible for conditions largely outside their control, and every ratepayer in California must contribute (even if only $2.50 per month) to cover its consequences. AB-1054 took the immediate action necessary to save California's failing electric utilities by stabilizing their finances, ensuring their ability to provide power beyond this year's wildfire season,[96] and promoting progress toward a clean energy future.[97] By

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Wildfire Fund and Overhauls California's Approach to Catastrophic Wildfires, Lexology (July 12, 2019), https://www.lexology.com/library/detail.aspx?g=482370eb-b11b-4727-8dae-1f9073ccf110 [https://perma.cc/62SK-WEGE] (noting that the utilities' contributions must come from shareholders and are not recoverable from ratepayers; and that PG&E is not allowed to participate until it emerges from bankruptcy).

91. Nossaman LLP, supra note 90. The $2.50 surcharge is the extension of a bond issued through the State Department of Water Resources that was set to expire. The CPUC determined that imposing the charge was "just and reasonable," citing a number of ratepayer benefits. See Nikolewski, California Regulators, supra note 89.

92. See Nikolewski, California Regulators, supra note 89.

93. A.B. 1054, 2019 Leg., Reg. Sess. (Cal. 2019).

94. See Nikolewski, California Regulators, supra note 89.

95. A.B. 1054, 2019 Leg., Reg. Sess. (Cal. 2019). This process takes into account factors both within and beyond the utility's control, such as humidity, temperature, and winds, in an important recognition of the unbridled power of climate conditions. Cal. Pub. Util. Code § 451.1 (2019).

96. 2020 was fraught with planned blackouts and brownouts due to "public safety public power shutoff[s]." See, e.g., Azi Paybarah, Citing Wildfire Risk, Utility Plans to Cut Power to 50,000 in California, N.Y. Times (Oct. 15, 2020), https://www.nytimes.com/2020/10/15/us/california-wildfires-power.html (on file with the *Columbia Law Review*) (last updated Oct. 26, 2020); see also supra note 60.

97. See John J. MacWilliams, Sarah La Monaca & James Kobus, PG&E: Market and Policy Perspectives on the First Climate Change Bankruptcy 27 (2019),

allowing utilities to recover the reasonably and prudently incurred costs of wildfires, while securing funds for wildfire victims to recover damages quickly, AB-1054 strikes a balance "between ensuring fairness to the owners of wildfire-damaged property and spreading the burden throughout the state."[98] AB-1054 still provides an appropriate incentive for utilities to comply with all safety protocols and do their part to reduce the risk of fires because, if the utilities act imprudently or unreasonably, their shareholders will be forced to bear the costs.[99] Thus, further removed from bankruptcy, the electric utilities receive a boost in creditworthiness that reduces their overall cost of capital and the potential pass-through costs to customers.[100] Taken together, AB-1054's measures acknowledge the unfortunate inevitability of utility-caused wildfires due to climate conditions that exacerbate the susceptibility of an aging and expensive electrical grid in the WUI. But by focusing on liability and "who pays what," AB-1054 obscures concerns about the overall (un)insurability of wildfires and the reality that the growing damages from wildfires will rapidly exhaust the fund.

2. *Critiques of AB-1054 in Its Current Form.* — Ratepayers, customer advocates, and wildfire experts have criticized AB-1054, arguing that the burden-shifting mechanism in the safety certification pushes the costs of utility liability and potential negligence onto ratepayers. By presuming that a utility acted reasonably when they have a safety certification, AB-1054 all but guarantees that utilities will be able to utilize the Wildfire Liability Fund to cover the protection gap. In attempts to force utilities to bear the costs of possible misfeasance, wildfire victims are in a "David and

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https://www.energypolicy.columbia.edu/sites/default/files/file-uploads/PG&E-CGEP_Report_081519-2.pdf [https://perma.cc/63FG-GGZP] ("[B]ankrupting the nation's utilities is in no one's best interest. Higher financing costs lead to higher electric bills paid by ratepayers, threaten recovery for victims, reduce states' abilities to make resiliency and renewable investments, and create uncertainty for employees and contractors.").

98. Jeremy Gradwohl, Comment, Electric Utility-Caused Wildfire Damages: Strict Liability Under Article I, Section 19 of the California Constitution, 92 Temp. L. Rev. 595, 626 (2020).

99. The required $5 billion initial investment in safety improvements, including more frequent power-line inspection and better vegetation management, will address the most glaring safety risks, while tying executive compensation to fire-safety performance targets a corporate culture of prioritizing profits over people. See MacWilliams et al., supra note 97, at 11. The bill also provides needed clarity to investors about the maximum amount that utility shareholders would be expected to pay when a wildfire occurs—importantly, at variance with the limitless liability regardless of prudency that was previously in place. Id.

100. Rating Action Commentary: Fitch Assigns IDRs of 'BB' to PG&E Corp. and Pacific Gas and Electric Co.; Outlook Stable, Fitch Ratings (June 15, 2020), https://www.fitchratings.com/research/corporate-finance/fitch-assigns-idrs-of-bb-to-pg-e-corp-pacific-gas-electric-co-outlook-stable-15-06-2020 [https://perma.cc/8R3T-CFWR] ("In Fitch's opinion, enactment of California Assembly Bill (A.B.) 1054 . . . designed to protect the public against deadly wildfires and facilitate socialization of wildfire liabilities under inverse condemnation while mitigating financial risk to investor-owned utilities [is] constructive . . . .").

Goliath" situation, in which they must provide evidence of serious negligence or wrongdoing to override the presumption accorded in favor of heavily lawyered, highly motivated utilities.[101] A lawsuit argues that AB-1054 is an undeserved bailout of the investor-owned utilities, "both financially and legally, from the consequences of their continued intransigence against prioritizing safety."[102] Though utilities have historically underinvested in safety measures,[103] AB-1054 continues to give them the benefit of the doubt through what are essentially per se findings of reasonableness.

AB-1054 has come under fire by academics for spreading the disproportionate burden of wildfire liability in the WUI across all electricity ratepayers in California. Urban residents of San Francisco pay the same surcharge as WUI residents of Paradise. As a matter of fundamental fairness and environmental justice, some have argued that people who choose to live in the WUI must "internalize the full costs of their choices and actions . . . [and] be prepared to pay more for electricity delivery to areas that are already at high risk of wildfires."[104] This critique

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101. See Nikolewski, California Regulators, supra note 89 (quoting April Maurath Sommer, Executive Director of the Wild Tree Foundation, an environmental group based in the Bay Area). One lawsuit has argued that AB-1054's burden shift is an unconstitutional deprivation of ratepayer's due process and Fifth Amendment rights. See Complaint at 39, 42, Cannara v. Nemeth, 467 F. Supp. 3d 877 (N.D. Cal. 2020) (No. 3:19-cv-04171-JCS); see also Rob Nikolewski, Lawsuit Filed to Stop California's New Wildfire Liability Law, San Diego Union-Trib. (July 19, 2019), https://www.sandiegouniontribune.com/business/energy-green/story/2019-07-19/lawsuit-filed-to-stop-californias-new-wildfire-liability-law [https://perma.cc/8RKV-CYMZ] (explaining the lawsuit's claims, including (1) that the $2.50 surcharge without just compensation violates due process, (2) that the cost-shifting standard defies codified safety rules, (3) that the higher utility bills violate the Fifth Amendment through an unlawful government taking, (4) failure to meet the urgency statute definition, and (5) undue influence from PG&E political contributions).

102. Katy Grimes, Lawsuit: California Utility Customers Forced to Bail Out Utilities for Wildfires They Cause, Cal. Globe (Oct. 9, 2019), https://californiaglobe.com/section-2/lawsuit-california-utility-customers-forced-to-bail-out-utilities-for-wildfires-they-cause [https://perma.cc/8GW7-F9C9].

103. Although AB-1054 supporters counter that the required investments and wildfire mitigation plans alleviate these concerns, the CPUC has been ineffective in engendering meaningful compliance with safety standards to this point. See George Skelton, There's a New Sheriff at the California Public Utilities Commission. PG&E Better Shape Up, L.A. Times (Oct. 21, 2019), https://www.latimes.com/california/story/2019-10-21/california-public-utilities-commission-marybel-batjer-pge (on file with the *Columbia Law Review*) (arguing that CPUC is "too utility-friendly" and needs to have "tighter scrutiny" over PG&E, whose "transmission grid is terribly outdated" and "trimming of flammable trees and brush around power lines is years behind schedule"); Naomi Wheeler, Fire, Wind, and Waves: Grid Resilience Threats and Opportunities in California and New York 3 (2020), https://www.law.berkeley.edu/wp-content/uploads/2020/08/Resilient-Coasts-Naomi-Wheeler.pdf [https://perma.cc/V3VQ-VGAK] ("PG&E does appear to have underinvested in maintaining and modernizing grid infrastructure.").

104. Myanna Dellinger, Electric Utility Wildfire Liability Reform in California, 49 Env't L. Rep. 11,003, 11,004 (2019); see also Benjamin Reilly, Free Riders on the Firestorm: How Shifting the Costs of Wildfire Management to Residents of the Wildland-Urban Interface

posits a free-rider problem within AB-1054: Californians in the WUI live with the assurance that they will recover damages from government wildfire resources subsidized by residents across California. However, WUI residents are not properly incentivized to change their behavior to reduce the severity of wildfires.[105]

Instead of increased electricity payments or other targeted surcharges on WUI residents, this Note argues that the residents of high-fire-risk areas should take measures that reduce the potential costs that their homes present to the state in the event of a fire. Citizens lacking resources to do so on their own must be assisted in this critical endeavor. Statutory solutions focused on equitable mitigation and prevention efforts are the appropriate response at this juncture in California's wildfire crisis. Preventing high wildfire damages must be the goal of the state and all of its citizens before life in the WUI becomes unsustainable.

II. ROLE OF ELECTRIC UTILITIES

AB-1054 leaves a fundamental question remaining: How might we prevent massive wildfires from turning into massive damage claims? A utility-run residential-fire-mitigation program would provide an answer. A partnership between utilities and their ratepayers to fire-harden low-income customers' homes could reduce wildfires' costs for both parties. Current legislation limits the utility–ratepayer relationship to damages, liability, and blame. Instead, legislation should require utilities to proactively assist their ratepayers' mitigation efforts before those same ratepayers become victims of a utility-caused fire. Regulators must equitably spread not just the cost of damages but also the cost of mitigation efforts that reduce those damages. This Part explains why California's utilities should be compelled to engage in residential mitigation efforts by considering the population of the WUI, a theoretical framework of support from theories of property law, and successes of other mitigation programs.

A. *Opportunity for Resiliency Beyond AB-1054*

Megafires like the Camp Fire are inevitable. Faulty electricity lines will work with hot, dry, and windy conditions to spark fires and threaten

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Will Benefit Our Public Forests, 42 B.C. Env't Affs. L. Rev. 541, 543 (2015) (arguing that there is a "moral hazard" in present wildfire management regimes that deflate the cost of living and insurance in the WUI to a level that does not reflect the true risk); Garrett D. Trego, Note, We Didn't Start the Fire . . . And We Won't Pay to Stop It: Financing Wildfire Management in America's Wildland-Urban Interface, 36 Wm. & Mary Env't L. & Pol'y Rev. 595, 597 (2012) ("[T]he undisputed rise in wildfire risk across the United States coupled with developer and landowner awareness of this risk warrants a shift of wildfire-related costs to those properties that receive the most benefit from government wildfire services.").

105. Dellinger, supra note 104, at 11,016 ("Currently, the role of residents in several U.S. locations in the case of wildfires tends to be passive, not active.").

communities throughout the state, no matter how prudently a utility behaves and despite a safety certification.[106] Given current trends, the $21 billion Wildfire Liability Fund will be exhausted quickly.[107] Additional strain will be placed on ratepayers and shareholders to cover the enduring protection gap.[108] AB-1054 established the Wildfire Liability Fund but overlooks the necessary discussion on reducing the damages that the fund is intended to bear. Further, AB-1054 fails to recognize that wildfire resiliency must be a collective effort because, otherwise, "[w]ealthier people may find ways to protect themselves, while others are left fending for themselves."[109] The state must intervene to manage wildfire risk so that it's not just the well-resourced who stay safe.

1. *Unequal Wealth and Fire Mitigation Distribution in the WUI.* — There is a common misconception that all of the WUI's residents are wealthy and white—people who moved into beautiful areas of nature and expected their lifestyle costs to be shared with residents of lower-fire-risk areas.[110] The reality, however, is far more complex. It is true that 76% of people living in regions with moderate to very high potential for wildfires are white and, for the most part, not socially vulnerable.[111] Yet alongside these relatively affluent communities live locals whose families have resided in the WUI for generations as well as low-income workers and retirees who have been pushed out of urban centers by the population growth and elevated home costs that characterize California's housing crisis.[112]

The unique sociodemographic mix of the WUI complicates the wildfire-mitigation process. Rich, white households are more likely to populate parts of the WUI better equipped to handle the threat of wildfires. For example, many of these areas are "Firewise communities." Firewise USA is a voluntary community program that designates communities in which a certain portion of homeowners have taken expensive risk assessment and mitigation steps in order to improve their

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106. Fires are sparked by many causes besides utilities, but this Note focuses specifically on utility-caused fires.

107. See MacWilliams et al., supra note 97, at 29.

108. See id. For instance, PG&E's estimated liability from the Camp Fire and other 2017 fires was over $30 billion, even before accounting for punitive damages, fines, and other penalties, ultimately totaling much more than utilities' large insurance policies (PG&E held $1.4 billion) could cover. Id.

109. See Branch & Plumer, supra note 82 (comparing examples of Florida homes that can withstand destructive hurricanes but are prohibitively expensive for most residents).

110. See Dellinger, supra note 104, at 11,013.

111. Ian P. Davies, Ryan D. Haugo, James C. Robertson & Phillip S. Levin, The Unequal Vulnerability of Communities of Color to Wildfire, PLOS ONE, Nov. 2, 2018, at 7–8 (basing study on census tracts).

112. See Zurich N. Am., supra note 37, at 17; see also Flavelle, Homeowners Who Can't Get Insurance, supra note 74 ("There are great needs to build housing in more affordable areas, which . . . tend to be these more exposed, fire-prone landscapes, because land is cheaper there . . . . There was a feeling that, well, it was worth the risk." (internal quotation marks omitted) (quoting David Shew, former staff chief of CAL FIRE)).

fire resiliency.[113] Those communities then receive insurance discounts. Conversely, communities comprised of individuals with higher levels of social vulnerability and lower socioeconomic status lack the financial and human capital necessary to enact similar fire mitigation programs.[114] The fact that fire-prone areas tend to be "populated by higher-income groups . . . threatens to overshadow the thousands of low-income individuals who . . . lack the resources to prepare or recover from fire" and distorts both public opinion and legislative responses.[115]

To be effective, wildfire mitigation must facilitate collective rather than solitary action. An individual's decision to invest in mitigation has a direct impact not only on the safety of their own home but also on the safety of their neighborhood by influencing how quickly a fire will spread and how large it will grow. Each member of the community has a "kind of veto power over the extent of collective achievement."[116] Those who

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113. The Firewise Program is administered by the National Fire Protection Association, but individuals and communities participate on a voluntary basis. Community members must form a board or committee comprised of residents and other wildfire stakeholders to identify the Firewise site, obtain a written wildfire risk assessment from the state forestry agency, develop an action plan of prioritized risk-reduction projects and investments for participants, and complete necessary homeowner actions and education activities to apply for certification. How to Become a Firewise USA® Site, Nat'l Fire Prot. Ass'n, https://www.nfpa.org/Public-Education/Fire-causes-and-risks/Wildfire/Firewise-USA/Become-a-Firewise-USA-site [https://perma.cc/ZYC3-LTTC] (last visited Nov. 18, 2020); see also Zurich N. Am., supra note 37, at 29; Public Education, Nat'l Fire Prot. Ass'n, https://www.nfpa.org/Public-Education/Fire-causes-and-risks/Wildfire/Firewise-USA [https://perma.cc/4CQN-P4V3] (last visited Oct. 14, 2020).

114. See Cassandra Johnson Gaither, Neelam C. Poudyal, Scott Goodrick, J.M. Bowker, Sparkle Malone & Jianbang Gan, Wildland Fire Risk and Social Vulnerability in the Southeastern United States: An Exploratory Spatial Data Analysis Approach, 13 Forest Pol'y & Econ. 24, 34 (2011) ("Reasons why socially vulnerable communities are less engaged with Firewise Communities or CWPPs may have to do with a range of factors emanating from lack of interest to again, a dearth of social and human capital in these communities.").

115. Davies et al., supra note 111, at 2. For instance, the argument that communities in the WUI should be charged their "fair share" of electricity rates due to the increased risks and costs of fire in their chosen home location would disproportionately hurt these rural communities where the median household income is 23% lower than urban communities. Erin Sullivan, Christopher Jackson, Daniel Broberg, Mark O'Dair & Vetri Velan, California Lawmakers Should Take Action to Mitigate the Effects of the 2019 PG&E Bankruptcy 3 (2019), https://sciencepolicy.berkeley.edu/wp-content/uploads/2019/07/PGE_memo_20190725.pdf [https://perma.cc/KLH4-9XYB].

116. Thomas P. Holmes, John Loomis & Armando González-Cabán, A Mixed Logit Model of Homeowner Preferences for Wildfire Hazard Reduction, *in* Proceedings of the Third International Symposium on Fire Economics, Planning, and Policy: Common Problems and Approaches 124, 125 (Armando González-Cabán ed., 2009) (internal quotation marks omitted) (quoting Jack Hirshleifer, From Weakest-Link to Best-Shot: The Voluntary Provision of Public Goods, 41 Pub. Choice 371, 373 (1983)). Assessments of wildfire risk mitigation on private properties have found that homeowners that "mitigate risk may have benefits that spillover from [their] property," as their actions "may encourage" their neighbors. Travis Warziniack, Patricia Champ, James Meldrum, Hannah Brenkert-Smith, Christopher M. Barth & Lilia C. Falk, Responding to Risky Neighbors: Testing for Spatial Spillover Effects for Defensible Space in a Fire-Prone WUI Community,

choose not to invest or are unable to do so add fuel to the fire. Wildfire mitigation must therefore reach broader swaths of the WUI and not just isolated Firewise communities to limit the destructive capability of fires. Low-income homeowners and renters face significant financial barriers in retrofitting their homes to meet fire-safe standards.[117] As such, promoting wildfire resiliency must be reframed as a socioeconomic issue rather than as a mechanism for rewarding individual effort. California must target fire-safety efforts at those homes that cannot invest in mitigation without financial assistance.[118]

B. *Theoretical Framework of the WUI Commons*

Fire safety in the WUI is a tragedy of both the commons and the anti-commons. Homeownership is traditionally understood as an individual undertaking, but in California's WUI, the safety of an entire community is directly impacted by its residents' individual decisions. In order to foster the collective action necessary to reduce the severity of wildfires, the theory of landownership and its accompanying obligations must be reevaluated.

1. *Tragedy of the (Anti)Commons.* — The tragedy of the commons, now a familiar trope, occurs in a shared-resource system. When individuals act in their own self-interest regarding the shared resource, contrary to the common good of all the users, they destroy or deplete it through their collective action.[119] An anticommons is the mirror image of this problem: When a single resource is owned by many people in fragmented pieces, individuals are able to frustrate others' beneficial uses of the overall resource and prevent what would be a socially desirable outcome.[120]

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73 Env't & Res. Econ. 1023, 1042 (2018). Mitigation is also not easily generalizable—it is shaped not only by the physical impacts of disaster but also by "axes of stratification" that include income, race, and ethnicity, as well as access to aid, assistance, and informal social support—factors that are themselves impacted by those axes. See Nat'l Rsch. Council of Nat'l Acads., Research on Disaster Response and Recovery, *in* Facing Hazards and Disasters: Understanding Human Dimensions 124, 158 (2006).

117. Timothy W. Collins, What Influences Hazard Mitigation? Household Decision Making About Wildfire Risks in Arizona's White Mountains, 60 Pro. Geographer 508, 519–21 (2008), https://www.tandfonline.com/doi/pdf/10.1080/00330120802211737?casa_token=oVSg_6MVHTgAAAAA:6I8m7lGfo2sh0_C4yu4CvUNWH30fO6tj1aT60BIiqsfaECES9Wr5ClI_yhZqYH6YI40mX9I9c_BMTA (on file with the *Columbia Law Review*).

118. See Holmes et al., supra note 116, at 134–35 (noting the importance of identifying and targeting households in the WUI that are least likely to participate in wildfire mitigation programs).

119. See Garrett Hardin, The Tragedy of the Commons, 162 Science 1243, 1244 (1968) (popularizing the idea of the tragedy of the commons in the context of the population problem).

120. Michael A. Heller, The Tragedy of the Anticommons: Property in the Transition From Marx to Markets, 111 Harv. L. Rev. 621, 668 (1998) (defining "anticommons property" as a "property regime in which multiple owners hold effective rights of exclusion in a scarce resource" (emphasis omitted)).

Although it doesn't quite fit the traditional analogies,[121] the shared "resource" at play in the California wildfire context is the ability to live safely in the WUI. Despite the realities of climate change and the corresponding dangers in the WUI, individuals continue to move into high-fire-risk areas.[122] The driving "self-interest" in this decision is multifaceted—escape from the housing crisis and prices in urban areas, access to nature and recreation, and innumerable other personal factors—but it is fundamentally founded on a belief, hope, or calculated risk that wildfires won't derail their plans.[123] Heedless residents fail to invest money, time, and effort in wildfire mitigation practices, exacerbating the fire risk for those around them.[124] As a result, the WUI is irresponsibly settled and developed. Safety from wildfires (the shared resource) is impaired by the collective behavior of the WUI's residents. Though some individuals construct wildfire-resistant housing and follow fire-safety codes, the return on their investment is reduced by the action or inaction of their neighbors.[125] Residents who perceive their individual efforts to be futile become apathetic and further reduce the potential success of fire mitigation to make life in the WUI safer and more sustainable. As Californians flock to the WUI in droves, individual freedom and self-interest continue to triumph over the common good in the WUI "commons."[126]

In such a tragedy of the commons, communities typically develop private property as a mechanism to prevent individual overuse or abuse of the shared resource.[127] In theory, private property rights incentivize

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121. The archetype and origin of the tragedy of the commons is the unregulated grazing of livestock on common land leading to overuse. See Hardin, supra note 119, at 1244. By contrast, an anticommons is characterized by underuse, for example, in patent thickets, in which the individuals who hold patents for medical research tools and tests necessary for drug development can block the use of each component or extract rents, preventing the public's access to the drug. See Michael Heller, The Gridlock Economy: How Too Much Ownership Wrecks Markets, Stops Innovation, and Costs Lives 5 (2008).

122. See supra section I.A.2.

123. See, e.g., Ingrid M. Martin, Holly Bender & Carol Raish, What Motivates Individuals to Protect Themselves From Risks: The Case of Wildland Fires, 27 Risk Analysis 887, 897 (2007) (explaining how mitigation behavior is dependent on knowledge about the risk of fires, belief about severity of the risk, and how vulnerable people believe they are).

124. Failure to mitigate is not just a personal choice, of course. It can be analyzed from structural levels, for instance, as a product of land use policy and city planning. City officials may choose to refrain from limiting development and imposing strict building requirements in order to encourage growth, thus reaping the economic benefits while increasing their community's vulnerability to losses. See supra note 82 and accompanying text.

125. The collective safety decisions of a community determine the severity of a fire's damage and ability to recover on a community level. See supra note 116 and accompanying text; see also Martin et al., supra note 123, at 897 ("Neighbors' or agencies' actions (or inactions) are an important factor in the decision-making process for homeowners in taking precautionary measures (e.g., peer pressure, property insurance, frustration with lack of action).").

126. Hardin, supra note 119, at 1244 ("Freedom in a commons brings ruin to all.").

127. A change in land rules is efficient when it reduces the sum of transaction costs (the costs that arise when individuals attempt to enforce or redefine property rights) and

individuals to take good care of their piece of the resource since the owner bears the full costs of its use and reaps all of the benefits of investment.[128] But in practice, the fragmented ownership of the WUI created by private property rights in each individual's piece of land instead blocks what would best reduce the costs of California's fires in a utilitarian world, thereby creating an "anticommons." If individuals had no rights to their parcels of land, the WUI's fire danger could be aggressively managed and limited through vegetation thinning, infrastructure reduction policies, and housing bans in high-risk areas.[129] But this cannot be said to be the truly socially desirable outcome.[130] Uprooting homes, families, and communities and destroying the natural landscape and beauty of the WUI in this manner implicates values of liberty, equality, and community that are more important than efficiency.[131]

Thus, the potential for living safely in the WUI is at a stalemate. To be effective, community-level mitigation must be sustained without regard to ownership lines, but boundaries proliferate.[132] Firewise communities

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deadweight losses (when the costs from individual's self-interested act exceed the individual's benefits from it). See Robert C. Ellickson, Property in Land, 102 Yale L.J. 1315, 1326 (1993); see also Harold Demsetz, Toward a Theory of Property Rights, 57 Am. Econ. Rev. 347, 350 (1967) (positing that property arrangements in all societies evolve efficiently in response to changes in technology, demand, and other economic conditions).

128. See Ellickson, supra note 127, at 1327 ("[T]he parcelization of land is a relatively low-transaction-cost method of inducing people to 'do the right thing' with the earth's surface . . . .").

129. For large events like fires, group (or state) ownership is most efficient when risks are high and there is no superior insurance method (or insurability is doubtful). See id. at 1342 (noting examples of pioneer communities of Jamestown, Plymouth, and Salt Lake City, where group ownership served to reduce group risk of devastating events). State ownership of the WUI would enable the entire area to be managed to reduce risk.

130. Managed retreat, akin to floodplain management policies, may still be the best solution in areas that present too high of a fire risk to be livable. Cf., e.g., Katharine J. Mach, Caroline M. Kraan, Miyuki Hino, A. R. Siders, Erica M. Johnston & Christopher B. Field, Managed Retreat Through Voluntary Buyouts of Flood-Prone Properties, Sci. Advances, Oct. 19, 2019, at 5 ("Voluntary property buyouts in the United States are among the longest-running programs of managed retreat globally . . . . Increasingly, there is agreement that retreat from some areas will become an unavoidable option under intensifying climate change.").

131. The reaction to similarly aggressive policies is seen on a micro level in the fight over trees in Nevada County. When PG&E announced their plan to cut down trees in the area to reduce fire risk, residents fought back by demonstrating, tree-sitting, and petitioning the court for injunctive relief. See John Orona, Nevada County Judge Halts PG&E Tree Removal, Union (Sept. 22, 2020), https://www.theunion.com/news/cut-it-out-2 [https://perma.cc/A9MJ-4DXV].

132. See Antony S. Cheng & Dennis R. Becker, Public Perspectives on the "Wildfire Problem", 65 Fire Mgmt. Today 12, 13 (2005), https://www.fs.fed.us/pnw/pubs/journals/pnw_2005_cheng001.pdf [https://perma.cc/LZN3-V2VP] ("Wildfire mitigation is most successful at the community level because mitigation must be sustained across ownership boundaries.").

exemplify how these barriers can be overcome to live fire-safely in communities that have the proper resources where neighbors work together.[133] This Note proposes a partnership between private utility companies and ratepayers across income levels to equalize access to the necessary financial and social resources, fighting both the commons and anticommons problems. When cooperation is subsidized and incentives are aligned, individuals may stop abusing the shared resource and, instead, enhance the collective safety of their community.

C. *Model Programs*

Two preexisting programs illustrate how the California Legislature can direct utilities and ratepayers toward communal investment in wildfire mitigation measures. Both California's earthquake retrofitting program and its mandated utility-run energy-efficiency programs target low-income households to successfully create more earthquake-resilient and energy-efficient communities, respectively. Wildfires are analogous to earthquakes and energy inefficiency: Each is an environmental reality whose costs must be minimized and prevented, rather than isolated catastrophes for which liability must be assigned.

1. *California's Earthquake Program.* — The California Brace + Bolt Program showcases valuable investments in resiliency through effective, targeted, and community-wide mitigation. Brace + Bolt provides grants to help qualifying homeowners seismically retrofit their homes to reduce potential damage from earthquakes.[134] ZIP codes are prioritized by earthquake hazard, identified using U.S. Geological Survey hazard maps, and earthquake vulnerability, identified by the percentage of pre-1940 houses in a census tract.[135] Older homes, especially those on fault lines, are more susceptible to earthquake damage because they typically lack bolting to their foundations and cripple-wall bracing.[136] Modern building code requirements (recall the fire-safe building codes in Chapter 7A) addressed these construction flaws.[137] Newer homes built to code are less likely to injure their occupants and more likely to survive damaging earthquakes, making "the adoption and enforcement of up-to-date building codes . . .

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133. See supra notes 113–114 and accompanying text.

134. Retrofitting involves bolting the house to its foundation and adding bracing around the perimeter. Homeowners can recoup the difference between the cost of the retrofit and the grant through 25% discounted earthquake insurance policies once their homes comply with California Existing Building Code Chapter A3. Brace and Bolt Grants, Cal. Earthquake Auth., https://www.earthquakeauthority.com/California-Earthquake-Insurance-Policies/Earthquake-Insurance-Policy-Premium-Discounts/Brace-and-Bolt-Seismic-Retrofit-Grants [https://perma.cc/CEP5-HXWW] (last visited Sept. 10, 2020).

135. Id.

136. Id.

137. Id.

[the most] important factor in reducing a community's risk."[138] Further, it is more cost effective to proactively retrofit a home than to rebuild from the rubble. After a 6.0-magnitude earthquake in Napa, restoring homes to their foundations cost homeowners up to $300,000.[139] A standard seismic retrofit, on the other hand, costs around $5,000.[140] Californians live under the constant threat of a severe earthquake, so retrofitting provides homeowners with increased security against financial and physical displacement following a disaster.[141]

The Brace + Bolt program has been largely successful at creating more earthquake-resilient communities because it identified and prioritized the most vulnerable homes. In earthquake-mitigation efforts, as in wildfire-mitigation efforts, neighbors' decisions impact one another—"[t]he more houses a neighborhood has that have been retrofitted, the fewer condemned buildings will blight the neighborhood after a catastrophic earthquake and the faster life can return to normal."[142] Applying these lessons to wildfire mitigation, particularly vulnerable homes within high-wildfire-risk communities must be brought into compliance with Chapter 7A to realize the community-wide returns on investment in wildfire-mitigation efforts and to provide homeowners with a measure of safety and security.

Brace + Bolt is financed by the California Earthquake Authority's Loss Mitigation Fund, which itself is funded by private investors, policyholder premiums, and the Federal Emergency Management Agency (FEMA) Hazard Mitigation Grant Program.[143] Because policyholder premiums

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138. FEMA, The Importance of Building Codes in Earthquake-Prone Communities 3, https://www.fema.gov/sites/default/files/2020-07/fema_earthquakes_the-importance-of-building-codes-in-earthquake-prone-communities-fact-sheet_20160719.pdf [https://perma.cc/QDF4-FEPF] (last visited Sept. 15, 2020).

139. Id.

140. Madalyn Amato, The State Is Offering Cash for Earthquake Retrofits. Here's How to Apply, L.A. Times (Oct. 28, 2021), https://www.latimes.com/california/story/2021-10-28/california-homeowners-can-get-cash-for-seismic-retrofits-heres-how (on file with the *Columbia Law Review*) (last updated Oct. 29, 2021).

141. Benefits of Seismic Upgrades: Is Earthquake Retrofitting Worth It in CA?, Cal. Earthquake Auth. (Feb. 25, 2020), https://www.earthquakeauthority.com/Blog/2020/Benefits-Seismic-Upgrades-Why-Retrofit-Your-Home [https://perma.cc/KV9B-2MTF] (noting a 99% probability that California will suffer a severe earthquake in the next thirty years).

142. Press Release, Cal. Dep't of Ins., Registration Opens for $3,000 Seismic Retrofit Grants (Jan. 23, 2018), http://www.insurance.ca.gov/0400-news/0100-press-releases/2018/release009-18.cfm [https://perma.cc/B88T-AZK2] (internal quotation marks omitted) (quoting State Assemblymember Adrin Nazarian).

143. See Janiele Maffei, Providing Residential Earthquake Insurance and Mitigation Programs to the State of California, STRUCTURE Mag. (July 2019), https://www.structuremag.org/?p=14706 [https://perma.cc/92J5-UGCJ]; see FAQs, Earthquake Brace + Bolt, https://www.earthquakebracebolt.com/FAQ [https://perma.cc/T2YD-C2TJ] (last visited Sept. 10, 2020); Our Financial Strength, Cal. Earthquake Auth., https://www.earthquakeauthority.com/About-CEA/Financials/CEA-Financial-Strength [https://perma.cc/9EGT-GBQY] (last visited Apr. 17, 2022).

throughout the state are used to subsidize retrofitting grants, each insured household effectively funds the earthquake-resiliency efforts of its neighbors. The homes at highest risk cannot bear the full cost of mitigation but, if mitigation efforts are not funded, then individuals, communities, and the entire state will suffer further. Thus, disbursal of the costs to retrofit vulnerable homes to the entire pool of insured households is an equitable way to reduce damage from natural disasters, and a similar framework should be adopted in the wildfire context.

2. *Utility Energy Efficiency Programs.* — Similar parallels can be drawn between wildfire-mitigation and energy-efficiency programs. California requires that utilities reduce the overall cost of electricity, including both financial and environmental costs, by providing energy efficiency programs to low-income customers.[144] The California Alternate Rates for Energy (CARE) program provides discounted energy rates to income-qualified households,[145] while the Energy Savings Assistance (ESA) program installs weatherization and energy-efficiency measures in ratepayers' homes and provides minor repairs that reduce electricity waste.[146] When the CPUC finds a "significant need" for energy efficiency in a particular service area, the responsible utility must offer and perform these improvements at no cost to the homeowner.[147] To prevent the overall cost from being "borne solely by any single class of customer," ratepayers statewide fund the program through monthly statutory public-purpose program surcharges on electricity bills (similar to the $2.50 Wildfire Fund charge).[148] This distributes energy-efficiency costs across every electricity user in the state to ensure the inclusion of low-income homes.

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144. Households with annual incomes that are 200% or less than the federal poverty guideline qualify for these programs. Guidelines for Low-Income Energy Efficiency Programs, Am. Council for an Energy-Efficient Econ., https://database.aceee.org/state/guidelines-low-income-programs [https://perma.cc/HQ7W-EU88] (last visited Oct. 15, 2020).

145. CARE reduces monthly electrical bills by 30% to 35%. 1 Gomathi Sadhasivan & Steven Chang, Op. Dynamics, 2019 California Low-Income Needs Assessment: Summary of Key Findings 13 (2019) (on file with the *Columbia Law Review*).

146. ESA's measures include, inter alia, attic insulation, energy-efficient appliances, weatherstripping, and door repairs. Cal. Pub. Util. Code § 2790(b)(1) (2022). The goals of the programs are to "reduce energy consumption, resulting in bill savings, while also increasing the health, comfort, and/or safety of the household." Cal. Pub. Utils. Comm'n, CPUC Low Income Energy Programs: Energy Savings Assistance Program Fact Sheet 2 (2017) (on file with the *Columbia Law Review*).

147. Cal. Pub. Util. Code § 2790(a); see also Cal. Pub. Utils. Comm'n, California Standard Practice Manual: Economic Analysis of Demand-Side Programs and Projects 4 (2001), https://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Energy_-_Electricity_and_Natural_Gas/CPUC_STANDARD_PRACTICE_MANUAL.pdf [https://perma.cc/Y483-XN33].

148. Cal. Pub. Util. Code § 739.1(a) (2014). Ratepayers participating in the programs are not charged. Id.; see also Cal. Pub. Util. Code § 900 (2001) (noting that the CPUC determines the most efficient, cost-effective ways to consistently provide CARE and ESA by considering "efforts to reach the targeted population and the types of discounts and services

Both CARE and ESA have found success. Each dollar invested in energy-efficiency programs resulted in $1.04 of cost savings.[149] The 1.4 million CARE enrollees constitute 90% of PG&E's eligible customers, and PG&E's ESA provided free energy-efficiency improvements to 85,168 homes in 2018 alone.[150] Requiring these investments in the neediest communities maximizes their impacts. Increased energy efficiency benefits everyone as an important tool in the fight against climate change. In the same way, requiring utilities to invest in wildfire resiliency within the homes of their most vulnerable ratepayers holds the power to reduce the severity of future fires throughout the surrounding communities.

Building on the CPUC's commitment to support low-income households, this Note proposes a partnership informed by earthquake retrofitting and energy-efficiency programs that will lower the overall cost of wildfires through proactive investments in residential wildfire-mitigation efforts.

III. STATUTORY UTILITY–RATEPAYER PARTNERSHIP

This Note proposes a legislative fix for a missed opportunity in California wildfire law. AB-1054 purports to allocate the costs of wildfires more fairly, especially regarding electric utilities. However, AB-1054 fails to prevent these already astronomically high costs from rising further. Wildfire prevention and mitigation efforts in the homes of the WUI's residents hold the key to preventing more severe and expensive wildfires in the future. In its current form, AB-1054 only allocates liabilities after the fact and ignores the cost of these critical residential-mitigation efforts. This Part recommends an amendment to AB-1054 that would establish and finance a utility-run residential fire-mitigation program, delineating the obligations of utilities and the involvement of ratepayers. Next, this Part shows how the CPUC's existing policies support this recommendation. It concludes by addressing potential counterarguments to this proposal, including the exacerbation of a moral hazard and the need for potentially untenable levels of individual responsibility.

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that should be provided by each utility"); Cal. Pub. Util. Code § 381 (2006) (establishing the authority to collect public purpose surcharge as a nonbypassable rate component).

149. Cal. Pub. Utils. Comm'n, Regulating Energy Efficiency: A Primer on the CPUC's Energy Efficiency Programs 7 (2016), https://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/News_Room/Fact_Sheets/English/Regulating%20Energy%20Efficiency%200216.pdf [https://perma.cc/XW9Z-NT79].

150. PG&E, Energy Savings Assistance Program and California Alternate Rates for Energy Program: Amended 2018 Annual Report 3–4 (2019), http://liob.cpuc.ca.gov/Monthly%20Report/PGE%202019%20(PY2018)%20ESA%20CARE%20Amended%20Annual%20Report.pdf [https://perma.cc/G6XS-434U].

A. *Structure of the Statute*

AB-1054 should be expanded through a public utilities code amendment, similar to the adoption of CARE and ESA,[151] to require that utilities organize and implement a low-income residential fire-mitigation program. Currently, California's electric utilities are in disarray as the state seeks to allocate liability for past fires. Focused on remaining viable, the electric utilities lack incentives to invest in the residential mitigation efforts required for sustainable life in the WUI under the specter of massive climate-change-induced wildfires. Yet, these same utilities benefit from the protection of the Wildfire Liability Fund. California's legislature should realign the incentives for utilities by requiring them to protect the homes of their most vulnerable ratepayers in order to access the Wildfire Liability Fund.

An effective statute would identify the homes with the greatest risk of amplifying the magnitude of wildfires and the homeowners least able to afford mitigation measures on their own. Then, the statute should require the utilities to invest in these problematic homes to bring them in compliance with Chapter 7A of California's building code in order to create communities throughout the WUI that are more resilient against wildfires. Because utilities have existing relationships with ratepayers throughout the state and possess experience in implementing wildfire-mitigation measures, they occupy the optimal position to effectuate the necessary changes. As outlined in the following sections, the statute should be financed by proportional contributions of utilities and a public-purpose program surcharge on ratepayers, require that utilities offer fire-mitigation measures to be installed in ratepayers' homes, and select ratepayers based on both fire vulnerability and economic need.

1. *Financing Strategy.* — Proportional contributions from electric utilities and a surcharge on ratepayers' monthly electricity bills finance AB-1054. To fund the proposed addition of a utility-run residential fire-mitigation program, the existing monthly surcharge should be reimaged and increased as a "public-purpose surcharge" paid by homeowners statewide. Meanwhile, electric utilities should no longer evade responsibility with a "safety certification." Under the proposed program, electric utilities would be required to make investments to mitigate wildfires in the homes of their ratepayers, rather than only improving their own assets and electrical lines, in order to benefit from AB-1054's liability-allocation scheme. In this way, the cost of preparing for wildfires to reduce overall losses would be borne equitably by both the electric utilities and ratepayers across California.

While it may seem unfair to force residents in low-fire-risk areas to contribute to mitigation efforts, the electric utilities and residents of the

151. Cal. Pub. Util. Code § 739.1 (2014); Cal. Pub. Util. Code § 2790 (2022).

WUI are unable to finance these investments on their own. Since mitigation investments reduce the severity and duration of wildfires, everyone in California will ultimately derive a benefit from these efforts and the preservation of their "commons." To collect a public-purpose program surcharge from ratepayers, the CPUC must only establish that the cost of the surcharge is outweighed by the benefits of residential preventive and mitigation efforts. For instance, the CPUC found the Wildfire Fund ratepayer charge to be "in the public interest as it supports the overall framework for managing future wildfire claims established by AB 1054" and it benefits ratepayers in an amount greater than the cost.[152] The CPUC determined that the projected statewide increases to electricity rates resulting from massive utility liability following future catastrophic fires absent AB-1054 far outweighed the marginal cost of the surcharge.[153] Given that utilities will continue to spark wildfires and that the damages from these wildfires have reached the point of uninsurability, the CPUC would meet the statutory burden of "just and reasonable" in applying a public-purpose program surcharge for the residential mitigation program.[154] Just as with ESA and CARE, the CPUC should apply this surcharge to support mitigation efforts for low-income households, thereby reducing the overall impact of climate change on the state of California.

Almost two decades ago, California set energy goals to fight climate change requiring that utilities make energy efficiency their top priority.[155] In what was then referred to as a "big bold energy goal," the CPUC aimed to provide all ESA-eligible customers the opportunity to implement the full spectrum of energy-efficiency measures in their households by 2020.[156] The CPUC pursued this goal by exercising its statutory authority to collect

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152. Cal. Pub. Utils. Comm'n, Decision Approving Imposition of a Non-Bypassable Charge to Support California's Wildfire Fund and Adopting Rate Agreement Between the California Department of Water Resources and the California Public Utilities Commission, Rulemaking 19-07-017, at 59 (2019), https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M314/K275/314275696.PDF [https://perma.cc/T3Q8-83G2].

153. The CPUC also considered the Legislature's public policy findings regarding the state's pursuit of "investment in safe, clean, and reliable power for California at a reasonable cost to ratepayers." Id. at 34, 55–56.

154. Cal. Pub. Util. Code § 451 (2018) ("All charges demanded or received by any public utility, or by any two or more public utilities, for any product or commodity furnished or to be furnished or any service rendered or to be rendered shall be just and reasonable.").

155. See Lara Ettenson & Christa Heavey, Nat. Res. Def. Council & Env't Entrepreneurs, California's Golden Energy Efficiency Opportunity: Ramping Up Success to Save Billions and Meet Climate Goals 5 (Pat Remick ed., 2015), https://www.nrdc.org/sites/default/files/ca-energy-efficiency-opportunity-report.pdf [https://perma.cc/A7WP-BBVL].

156. See S. Cal. Edison, Energy Savings Assistance (ESA) Program Plan and Budget Proposal for the 2015–2017 Program Cycle 1, 3 (2014), http://www3.sce.com/sscc/law/dis/dbattach5e.nsf/0/9B692357E90E2E7488257D950003A8E3/$FILE/A.14-11-XXX_2015-2017%20ESA-CARE%20App%20-%20SCE-02%20Testimony.pdf [https://perma.cc/3B8S-ZYXK].

public-purpose program surcharges from nonparticipating ratepayers.[157] For their part, the utilities successfully educated ratepayers, produced financial savings, and created energy efficiencies throughout the state.[158]

California is now in a similar position regarding wildfires as climate change has magnified the consequences of wildfires throughout the state. Governor Newsom has set wildfires—and ensuring that the costs of climate change do not fall on those least able to afford it—at the top of the state's priorities.[159] Accordingly, the state must treat the fight against wildfires like it did the fight against energy inefficiency. More broadly, to fight climate change effectively, Californians must grapple with all of its ramifications. Ignoring an inequitable framework for dealing with wildfires undermines the entire fight for environmental justice. Instead of funding wildfire-related legislation through backdoor charges and half-measures, AB-1054 should implement a clear public-purpose program surcharge that recognizes the level of investment necessary to achieve equity in the battle against wildfires.

2. *Utilities' Role.* — Utility wildfire mitigation should be statutorily required not just within the electricity grid but also inside the homes of ratepayers. Utilities are in the optimal position to invest in residential mitigation efforts as they have existing, dedicated wildfire-mitigation committees and years of trial and error in attempting to reduce fire risk in their electrical infrastructure.[160] Further, residential mitigation efforts are parallel to the mitigation practices that utilities already perform, including vegetation management, ignition reduction in high-risk areas, and use of fire-resistant materials to harden systems.[161] The utilities should install the improvements necessary to bring a home into compliance with Chapter 7A through an auditing process similar to the utilities' determination of

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157. Cal. Pub. Util. Code § 381 (2019).

158. See Strike Force, supra note 47, at 24 ("The state has had success with programs that align the incentives of utilities and consumers in using less energy, including programs providing financial incentives or rebates, incorporating efficiency requirements in various codes and standards, and providing education and technical assistance.").

159. See Off. of Governor Gavin Newsom, Governor Newsom Delivers State of the State Address, CA.gov (Feb. 12, 2019), https://www.gov.ca.gov/2019/02/12/state-of-the-state-address [https://perma.cc/YFR3-JGBE] ("We will seek justice for fire victims, fairness for employees, and protection for ratepayers. We will continue to invest in safety, and we will never waver on achieving the nation's most ambitious clean energy goals.").

160. See Cal. Pub. Utils. Comm'n & BCG, Reducing Utility-Related Wildfire Risk: Utility Wildfire Mitigation Strategy and Roadmap for the Wildfire Safety Division 17–18 (2020), https://energysafety.ca.gov/wp-content/uploads/docs/strategic-roadmap/final_report_wildfiremitigationstrategy_wsd.pdf [https://perma.cc/6YR5-DQUB].

161. PG&E's wildfire-mitigation-plan priorities include: (1) vegetation management and enhanced inspections, (2) wildfire response, (3) system hardening, (4) situational monitoring, (5) operational practices such as de-energization, and (6) technology research and development; while SCE focuses on: (1) ignition reduction in high-risk areas, (2) fire suppression, (3) system hardening, and (4) communication. See Strike Force, supra note 47, at 51.

which in-home weatherization services to provide through ESA.[162] Additionally, the fire-mitigation auditing process should be unified with existing evaluations of home needs for other utility-improvement programs, such as ESA, saving both time and money. Conducting a single comprehensive audit for various environmental hazards would provide greater efficiency and prevent the occurrence of conflicting or redundant measures since "[t]he most cost-effective time to improve efficiency or electrify existing buildings is at the time of renovation and/or equipment replacements/upgrades, when work is already being done."[163]

Fire-mitigation measures implemented by the utilities should focus on roofs, exterior vulnerabilities, and defensible space.[164] Roofs present particular dangers due to exposure to wind-blown embers and accumulation of flammable debris. Retrofitting a home's roof with fire-resistant materials is therefore one of the most cost-effective and important actions.[165] Modifications to flammable exterior walls, doors, and windows are more difficult because replacements with wildfire-resistant materials can cost over $40,000, depending on the home's features.[166] Accordingly, improvements must adapt to the needs of the "whole house" as it stands within its community.[167] For instance, homes are at higher risk when backed up against a hill or very close to another home, so siding replacement should be prioritized when a home poses a hazard to its

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162. ESA utilizes a "whole house" approach to determine the needs and opportunities for a particular household to receive free home weatherization, energy-efficient appliances, and energy education services. A home is considered "treated" once it is income qualified, assessed, and has received three electric, gas, or combination measures along with in-home energy education. See S. Cal. Edison, supra note 156, at 14.

163. Sustainable Dev. Sols. Network, America's Zero Carbon Action Plan 245 (2020), https://irp-cdn.multiscreensite.com/6f2c9f57/files/uploaded/zero-carbon-action-plan.pdf [https://perma.cc/JCL3-93AN]. This logic should be applied to building code requirements at other stages of home construction as well. For instance, when a building undergoes a major renovation, it should be required to upgrade to the fire-safe standards and applicable codes at the same time. Id. Wildfire-resiliency efforts confer benefits to individual households, communities, and the environment as well as to the economy. Investment into "[s]uch a program stimulates demand for trained professionals and high performance products and helps advance the state of knowledge in the industry by providing experience to the design and construction communities and creating examples and data." Id. at 251.

164. For roofs: Install a fire-rated covering, cover vents with screenings, and install bird stops. Headwaters Econ., supra note 24, at 28–29. For exterior walls: Ensure a six-inch noncombustible zone at the base of the wall, install multi-pane, tempered glass windows, and use ignition-resistant siding. Id. at 34. For landscaping: create defensible space surrounding the home, and create a near-home noncombustible zone within five feet. Id. at 45.

165. Id. at 27–28, 31. Fire-safe roofs should be required in all construction. In addition to providing greater safety from wildfires, roof retrofits (making the roof better insulated and ventilated) can improve a home's energy efficiency for heating and cooling. See id. at 31.

166. Id. at 34–36.

167. See supra note 162 and accompanying text.

occupants and neighbors.[168] Finally, the creation of defensible space around a home through vegetation management is essential to reduce the chances that a fire burns up to a home's base.[169] Together, these measures would bring the typical vulnerable home in compliance with Chapter 7A.[170]

Incorporating these requirements into a California Public Utilities Code amendment would result in significant overall savings for all Californians. Quantifiable savings come in the form of reduced damages from a fire that must be borne by the utilities, the state, and its residents.[171] The value of protecting vulnerable families and homes from displacement and destruction cannot be overstated.

3. *Ratepayer Selection.* — The ratepayers who benefit from the proposed utility-run program should be selected based on location (in a parallel to the earthquake grants)[172] and income (similar to the utility energy-efficiency programs).[173] Fire-hazard severity zone maps, created both by the CPUC and CAL FIRE, identify the varying degrees of wildfire hazards throughout different parts of California. The degree of wildfire hazard is based on factors such as fuel, slope, and fire weather, which are the physical conditions that contribute to the likelihood that an area will burn.[174] The zone maps also identify areas where wildfire damage can be limited through mitigation efforts.[175] Under the proposed program, a utility would first identify the highest-risk ZIP codes in its service areas. Then, within those ZIP codes, the lowest-income households and pre-

168. Headwaters Econ., supra note 24, at 36.

169. See id. at 45 (noting the importance of designating a "near-home" zone with a five-foot radius where all combustible materials are removed to minimize ignition opportunities).

170. See supra notes 23–25 and accompanying text (discussing Chapter 7A requirements).

171. See Headwaters Econ., supra note 24, at 7 (observing that federal fire-suppression expenditures cost taxpayers an average of $3.7 billion per year, and beyond wildfire-suppression costs, communities bear long-term damages, including lost business and tax revenue, physical and mental health effects, watershed rehabilitation, property infrastructure repairs, and loss of human life).

172. See supra section II.C.1.

173. See supra section II.C.2. The income-level cutoff should feature a gradated approach: All homes in high-risk areas should be able to receive a fire-safety audit to identify their risk areas, middle-income homes should receive an audit and a partial subsidy of mitigation measures, and low-income homes should receive an audit and the full cost of mitigation measures.

174. FHSZ Viewer, CAL FIRE, https://gis.data.ca.gov/datasets/789d5286736248f69c4515c04f58f414 [https://perma.cc/T28Y-LSHR] (last visited Oct. 17, 2020); see also Cal. Pub. Utils. Comm'n, CPUC Fire-Threat Map, http://ftp.cpuc.ca.gov/safety/fire-threat_map/2021/CPUC%20Fire%20Threat%20Map_v.3_08.19.2021.Letter%20Size.pdf [https://perma.cc/2C95-KEPV] [hereinafter Cal. Pub. Utils. Comm'n, CPUC Map] (last updated Aug. 19, 2021) (depicting areas where enhanced fire safety regulations will apply).

175. Cal. State Geoportal, supra note 174; Cal. Pub. Utils. Comm'n, CPUC Map, supra note 174.

building-code homes would be selected. Although all homes in high-fire-risk areas should be able to receive a fire-safety audit to identify vulnerabilities, subsidization of the measures recommended in the audit would be limited to the selected homes. The utilities can leverage existing participation in ESA and CARE by households in their service area to build on prior interactions and streamline the selection process.[176]

In contrast, ESA and CARE cover all customers below a certain income level. In the context of a wildfire-mitigation program, this targeting strategy is prohibitively expensive and not practical. An effective targeting strategy for wildfire mitigation must appropriately focus on the most vulnerable areas *and* maximize community-wide mitigation, leading to the most efficient allocation of scarce resources. For its part, Brace + Bolt targets only the areas of highest earthquake risk and vulnerability without regard to household income. Again, in the wildfire-mitigation context, this would waste limited resources on higher-income households, which can better afford mitigation measures and are more easily able to recover following a fire. The proposed program must therefore consider both income level and fire risk to ensure that funding is put toward its value-maximizing use.

By implementing fire-mitigation improvements for ratepayers in this manner, the utilities can create wildfire-resilient communities in poorer areas throughout the state, akin to the "Firewise" communities in wealthier areas, and combat the tragedy of the commons. These communities, in turn, would be characterized by households who trust their electricity provider, are educated about how they can reduce fire risk, and ultimately present a lower danger of damages from inevitable utility-sparked fires.

B. *Support for a Utility–Ratepayer Partnership*

An expenditure of public, ratepayer, and utility funds is likely to be met with resistance. Californians may decry the surcharge and its imposition of retrofitting costs on residents outside the WUI. Utilities may resist additional obligations during a time of already heightened public scrutiny. However, California's wildfire crisis requires "big, bold" action just as the energy crisis did two decades ago.[177] This section explains the practical support a utility-run residential fire-mitigation program finds in the CPUC's commitment to low-income households.

1. *CPUC's Commitment to Low-Income Customers.* — The CPUC is committed to ensuring that essential utility services remain affordable and

176. For example, Southern California Edison's ESA participation strategy includes brand identity, targeted data-driven local efforts, and formal marketing efforts to make sure that underrepresented customer groups enroll and have a positive experience. S. Cal. Edison, supra note 156, at 45. The existing framework provides an opportunity to integrate a fire-mitigation program seamlessly. See infra notes 194–197 and accompanying text.

177. See supra notes 155–158 and accompanying text.

accessible.[178] While climate change obstructs that goal, the CPUC is resolute that "the state's transition to a clean economy can only be considered successful if it includes all Californians."[179] Accordingly, the CPUC has prioritized different classes of customers to ensure that any energy opportunity is delivered equitably, such as in the implementation of programs like ESA and CARE.[180] Beyond promoting equity in electricity access, the CPUC works to "achieve[] energy savings while improving quality of life for low-income customers."[181] In assessing quality of life, the CPUC comprehensively evaluates the hardships and burdens of individual low-income customers.[182] For instance, the CPUC considers factors beyond economic status, such as senior-household-member status, smaller household size, nonwhite race and ethnicity, and residence in a manufactured/mobile home or in a rental home.[183]

The stark lack of equity for vulnerable and low-income communities evident in current wildfire-mitigation investments and the overlap of other hardships in those households should elicit a response from the CPUC. In the energy crisis, the CPUC addressed the universal costs of climate change from energy inefficiency by targeting the households who were unable to reduce their own contributions. Now, it should address the immense statewide costs of climate change from utility-involved wildfires by targeting the households that are least able to protect themselves and their communities.

C. *Counterarguments*

The most powerful counterarguments against a utility-run residential fire-mitigation program center on the incentives, and lack of incentives, that it would create. Funding efforts to retrofit homes could be attacked

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178. Cal. Pub. Utils. Comm'n, Affordability, CA.gov, https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/affordability [https://perma.cc/FXF7-9MS3] (last visited Dec. 19, 2020).

179. Martha Guzman Aceves, Helping Disadvantaged Communities Go Green, CPUC News Blog (July 3, 2018), https://www.cpuc.ca.gov/cpucblog.aspx?id=6442458018&blogid=1551 [https://perma.cc/RVZ8-DCYC].

180. Cf. id. (noting that programs to increase the use of solar energy must be targeted to communities that need economic assistance to implement them). For further discussion, see supra section II.C.2.

181. Energy Div., Cal. Pub. Utils. Comm'n, California Electric and Gas Utility Cost Report: AB 67 Annual Report to the Governor and Legislature 41 (2019), https://www.cpuc.ca.gov/-/media/cpuc-website/files/uploadedfiles/cpucwebsite/content/about_us/organization/divisions/office_of_governmental_affairs/legislation/2019/2018-ab-67-report.pdf [https://perma.cc/EH5S-YBYM].

182. See Sadhasivan & Chang, supra note 145, at 12 (describing the results of a statutorily mandated report on the efficacy of the CARE and ESA programs, including "whether existing programs adequately address low-income electricity and gas customers' energy expenditures, hardships, language needs, and economic burdens").

183. Id. at 21 tbl.4 (listing demographic metrics analyzed in the Low-Income Needs Assessment).

as a subsidization of life in the WUI, incentivizing remaining there at the expense of residents of lower-fire-risk areas and creating a moral hazard. Further, as with any program that requires individual participation, its success depends on the investment by communities who may be resistant to the imposition of fire-mitigation standards and distrustful of utility intrusion into their homes. This section explains why counterarguments to the proposed statute are overridden by the reality of the moral hazards already present in the WUI, the need to move past the question of how to prevent moral hazards to the question of how to sustain a way of life, and the successes of other utility programs that require individual participation.

1. *Moral Hazard.* — A major policy argument against this Note's proposal is the moral hazard that it could create. A moral hazard occurs when there is a lack of incentive to guard against risk because one is protected from its consequences. The National Flood Insurance Program provides an unfortunate example. The program is intended to minimize the economic impact of floods on a national scale by providing highly subsidized, affordable flood insurance in areas of high flood risk that have implemented floodplain management standards.[184] These discounted rates, which can reduce the cost of flood insurance by up to 50%, have inadvertently encouraged people to live in vulnerable areas and to rebuild properties multiple times after they are destroyed. Ultimately, more money is put into these properties than they are worth, and disasters result in greater insured losses.[185]

In parallel, one might argue that subsidizing retrofits of homes (or providing other fire protection, insurance, or zoning subsidies) in high-fire-danger areas of the WUI would encourage individuals to remain in riskier locations and prevent them from internalizing the costs of future fires. But this argument is a few steps behind the reality. On a macro scale,

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184. See Ike Brannon & Ari Blask, Cato Inst., Reforming the National Flood Insurance Program: Toward Private Flood Insurance 2–3 (2017), https://www.cato.org/publications/policy-analysis/reforming-national-flood-insurance-program-toward-private-flood [https://perma.cc/V8ZS-HA7N].

185. See id. at 6–7 ("[T]he underpricing of most flood insurance has still inflated property values and encouraged more building in dangerous areas."); see also Mary McGee, Moral Hazard and the National Flood Insurance Program 19 (Apr. 30, 2014) (unpublished manuscript), http://blogs.colgate.edu/economics/files/2014/09/McGee-2014-Moral-Hazard-and-the-National-Flood-Insurance-Program.pdf [https://perma.cc/Z5WX-J3VR] (suggesting that the NFIP "encourages people to increase, or even maintain, the value of their property in a floodplain"). Over a third of flood-loss claims and payments are for these "repetitive loss" properties. Amendments to the NFIP have attempted to combat its perverse incentive effects. See Kevin T. Starbuck, Moral Hazard: How the National Flood Insurance Program Is Limiting Risk Reduction, at xvi–xvii (Dec. 2016) (M.A. thesis, Naval Postgraduate School) (on file with the *Columbia Law Review*) (noting that policyholders filing for repetitive losses "account[] for a disproportionate 35.5 percent of flood loss claims and 30.5 percent of claim payments" and describing legislative reforms).

this hazard is already present in the provision of firefighting services in the WUI:

> The promise of aggressive firefighting at no cost may reduce private incentives to choose fire-proof building materials and clear brush around homes, actions that can decrease the threat to homes during a wildfire. Similarly, federally financed firefighting limits incentives for cities and states to create and enforce wildland building codes and defensible space regulations.[186]

Instead of increasing the moral hazard of settlement in the WUI,[187] the proposed amendment to AB-1054 would actually encourage private actors (the utilities and, by extension, their ratepayers) to internalize a larger share of the firefighting costs that living in the WUI imposes on the rest of the state by lowering firefighting costs and the overall damages from fires.

This proposal does not suggest that new development and expansion should be encouraged in the WUI. When individuals decide to build in the WUI, they must invest their own money to comply with Chapter 7A's requirements. The proposed statute would apply only to homes that were built before the building code came into effect and exclude new development from its subsidization. To further combat the existing moral hazard, a provision in the proposed statute could charge a heightened fee for utility hookups in previously undeveloped plots of land in areas designated by the CPUC as high fire hazard severity zones.[188] Ideally, this fee would encourage construction in places where developers are not faced with a heightened fee and building-code restrictions. The fee would avoid punishing current WUI homeowners who may not be able to afford to move or to mitigate the danger to their homes.[189] If areas are deemed to be too high risk to be livable, a "managed retreat" through voluntary

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186. See Patrick Baylis & Judson Boomhower, Moral Hazard, Wildfires, and the Economic Incidence of Natural Disasters 3 (Nat'l Bureau of Econ. Rsch., Working Paper No. 26550, 2019), https://ssrn.com/abstract=3504434 [https://perma.cc/9JG2-HAUZ].

187. This moral hazard is essentially present wherever the risks and costs of natural disasters (increasing with the effects of climate change) must be borne collectively by a state or its citizens, rather than just the affected individual. But see Carolyn Kousky & Leonard Shabman, The Hazard of the Moral Hazard—Or Not, 37 Nat'l Hazards Observer 1, 14 (2013), https://hazards.colorado.edu/uploads/observer/2013/may13_observerweb.pdf [https://perma.cc/VRU9-D57W] (arguing that there is no moral hazard in disaster aid because the "failure to insure or reduce risks is likely not due to incentive effects from aid, but rather from myopia, optimism, or budget constraints").

188. See generally Scott Dylan Westerlund, How Much Does It Cost to Set Up Utilities on Land?, Angi (Mar. 28, 2022), https://www.angi.com/articles/how-much-does-it-cost-have-water-and-electric-and-eeptic-piece-land.htm [https://perma.cc/VXX8-8FSP] (explaining the costs of utility hookups on vacant property).

189. See Lisa Grow Sun, Smart Growth in Dumb Places: Sustainability, Disaster, and the Future of the American City, 2011 BYU L. Rev. 2157, 2161 (noting that "retreat from hazardous areas is notoriously difficult to implement given pre-existing property rights, the costs associated with voluntary buy-outs, the likely disruption of existing community ties that relocation entails, and local political opposition to relocation efforts").

buyouts of high-risk properties may become necessary.[190] Construction in the WUI must be limited and regulated in order to avoid exacerbating the existing dangers, but the current residents must not be left behind in the effort to live fire-safely.

The scale of wildfire disasters in California demands more sustainable solutions and heavier intervention from the state. The crisis has necessitated action beyond assigning individual blame. The overshadowing role of climate change has turned fires into "acts of god" rather than solely the fault of an individual or electric utility. Accordingly, statutory solutions must place a greater focus on investing in resiliency to minimize losses before they occur rather than on ex post liability schemes.

2. *Individual Responsibility.* — The proposed statute requires individual action and responsibility. Selected homeowners must elect to take advantage of this program despite possible inconvenience and distrust of their utility, and they must invest in the upkeep of fire-safety measures, such as managing vegetation in the defensible space and clearing gutters of debris despite the possible expenses. One may oppose a residential fire-mitigation program because its effectiveness turns on the buy-in of communities who, by definition, have not engaged in fire-mitigation efforts prior to the program.

Comparisons to the utility energy-efficiency programs are particularly salient to this concern. CARE and ESA, respectively, have 90% and 84% participation rates among eligible households.[191] Given the overlap in households participating in both CARE and ESA, and the connection between tenure in one program and participation in the other, selected households for the fire-mitigation program would also be able to build on these existing frameworks.[192] The program could then tap into the networks of communication that characterize the relationships between participating households and their utility provider.[193]

Further, participation in a residential fire-mitigation program would benefit from the triennial Low-Income Needs Assessment, conducted by

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190. See supra note 130.

191. See Sadhasivan & Chang, supra note 145, at 13. Overall, participants have had positive experiences with the utility-run programs, especially when they have received a targeted combination of measures to improve their homes, including energy education. Id. at 8, 14, 41.

192. See id. at 31 ("About 17% of the current CARE participants . . . participated in ESA after enrolling/recertifying . . . . [A]bout 6% of current CARE customers participated in ESA after enrolling in CARE and an additional 11% participated in ESA after recertifying for CARE, indicating that longer tenure in CARE leads to higher participation rates in ESA.").

193. See S. Cal. Edison, supra note 156, at 50 ("SCE can leverage its customer analytics to personalize messaging and offer relevant demand side management solutions directed at customers within its service territory. Activities are tied to key engagement opportunities that are unique to the customer and the utility . . . . Overall, the IOUs are best suited to implement these activities.").

the CPUC.[194] The CPUC studies the effectiveness of participation strategies and the willingness of eligible households to participate in CARE and ESA[195] by evaluating the retention of eligible participants, barriers to enrollment (i.e., uncertainty over eligibility and the perception that enrolling is inconvenient), methods to maximize enrollment among non-English-speaking customers and other groups with high levels of vulnerability, and the overall needs of low-income communities.[196] The infrastructure to evaluate participation and education efforts and successes of precedent programs instruct a similarly structured fire-mitigation program on the barrier of individual participation. [197]

More generally, as climate change creates worsening disasters around the world, "[f]or the first time, the average American is likely to see climate change as a here, now, us problem."[198] Homeowners must come to recognize the social obligations that are intrinsic to ownership of land in a society afflicted by climate change and allow the necessary protections and regulations into their homes and properties.[199] Given this reality, the proposed statute represents a necessary commitment to making equitable wildfire mitigation possible in the first place so that the negative impacts of climate change can be reduced in the long run.

CONCLUSION

The law has an essential role to play in allocating both the ex ante and ex post costs of environmental disasters that have become commonplace in a world suffering from the consequences of climate change. At this point, "[t]he damages caused by wildfires are unsustainable for the directly impacted victims, for the state, which is spending hundreds of millions of dollars to respond, and for local communities trying to

194. Cal. Pub. Util. Code § 382(d) (2014).

195. The "willingness factor" is exceptionally important to how the utilities evaluate the effectiveness of the programs since their goal is 100% participation. See, e.g., S. Cal. Edison, supra note 156, at 15–18. The utilities further consider specific barriers like (1) having to be home during the day or taking time off work, (2) having contractors in the home, (3) lack of perceived need, and (4) getting landlord's permission. Id. at 22.

196. See Sadhasivan & Chang, supra note 145, at 37 & tbl.13.

197. See S. Cal. Edison, supra note 156, at 44 ("When it is advantageous to both programs, SCE currently links the ESA and CARE offerings together as a 'bundled solution' to help income-qualified customers manage their energy bills through several marketing channels . . . .").

198. Adam Nagourney & Shane Goldmacher, A New Front in the Biden-Trump Battle for the Suburbs: Wildfires, N.Y. Times (Sept. 15, 2020), https://www.nytimes.com/2020/09/15/us/politics/fires-trump-biden-suburbs.html (on file with the *Columbia Law Review*) (quoting Edward Maibach, director of George Mason University's Center for Climate Change Communication).

199. Cf. Green, supra note 78, at 567 (arguing that individual ownership must serve human values and that "ownership has long-since ceded authority to the state" for environmental concerns).

rebuild."[200] Based on the holistic evaluation of actors involved in and impacted by California's wildfire crisis, this Note recommends that the legislature focus on mandating investments in resiliency rather than assigning liability by requiring utilities to administer a low-income fire-mitigation program to equitably reduce the damages from inevitable wildfires.

200. Strike Force, supra note 47, at 2.