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Climate change and utility wildfire risk: A proposal for a federal backstop

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and Eric Macomber**



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This policy proposal is a proposal from the author(s). As emphasized in The Hamilton Project's original strategy paper, the Project was designed in part to provide a forum for leading thinkers across the nation to put forward innovative and potentially important economic policy ideas that share the Project's broad goals of promoting economic growth, broad-based participation in growth, and economic security. The author(s) are invited to express their own ideas in policy proposal, whether or not the Project's staff or advisory council agrees with the specific proposals. This policy proposal is offered in that spirit.

BROOKINGS

Abstract

In the United States, utility-ignited wildfires threaten the affordability of electricity rates, the implementation of state and federal clean energy policies, and the housing market in several Western states. To date, unless electric utilities have themselves caused a significant wildfire that led to substantial losses, most have not visibly taken even basic steps to mitigate the risk that their system might cause a fire. At the same time, because of market perceptions of undifferentiated sector risk, utilities are facing rising financial costs for infrastructure investments that the United States needs them to make. In this proposal, we describe the core approach to utility wildfire mitigation developed by California utilities in conjunction with their economic and safety regulators and explain how parts of this mitigation framework might be applied across the West via a voluntary multistate and federal program, building on California's Utility Wildfire Mitigation Playbook. We then propose that participation in this safety program could be dramatically increased by creation of a federal fund, to be called the Utility Wildfire Fund, access to which is conditioned on compliance with minimum safety standards set forth in the Playbook. The federal Utility Wildfire Fund could serve as a risk-pooling mechanism to better manage costs associated with fires that could occur even after utilities take necessary actions to reduce risk. Creation of such a fund would stabilize and lower financial risks for Western electric utilities, thereby lowering their financing costs and so facilitating needed clean energy and transportation electrification investments. By both substantially lowering risks and providing a form of reinsurance for utilities, this fund would also act to stabilize homeowners' insurance markets and the broader housing market in parts of the West where these markets are threatened by the large and growing losses associated with utility-ignited wildfire.

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1. Introduction

Utilities are, by design, intended to be low-risk enterprises through which large amounts of financial capital can be deployed at low cost to build long-lived infrastructure (Pescoe 2018). Access to low-cost capital—from both shareholders and bondholders—is essential to the utility business model and to electricity affordability. It is even more important as the United States pursues unprecedented investment in electric infrastructure aimed at decarbonizing electricity generation sources and facilitating the full electrification of most on-road transportation and building energy needs (most notably, space and water heating). Unmitigated risk from wildfires thus threatens not only the safety of ratepayers if fires occur, but also the national project of decarbonizing the electricity system and of electrifying as many energy uses as possible. A failure to address wildfire risk implies a failure to finance needed transmission and distribution infrastructure to achieve the nation's electrification and decarbonization goals.

This is an urgent challenge. Utilities now need to deploy unprecedented—at least in the past 25 years—levels of capital to manage electricity demand growth associated with electric vehicles, electrification of buildings, and, most recently, the growth in AI-related data center needs (Ahumada Paras et al. 2023). At the same time, utilities must also make large investments in new transmission infrastructure to connect new, more-dispersed, and cleaner sources of generation to population centers where energy is consumed. Thus, the financing challenges created by utility-ignited wildfire risk are occurring at a time when utilities need to invest more in new infrastructure than they have in the living memory of most people managing them or regulating them. Not since the 1960s—which was before the first Organization of the Petroleum Exporting Countries (OPEC) oil embargo that resulted in reduced rates of growth in electricity demand coupled with efforts to improve energy efficiency—have U.S. utilities needed to build infrastructure at close to the currently projected rates. The financing problems caused by utility wildfire risk could not be coming at a worse time for the industry or the nation, given our expectations

of what the electricity industry will contribute to achievement of our energy transition goals.

Even if utilities are allowed to fully pass through costs associated with these higher risk premia to their customers, doing so would substantially interfere with the ability of electric utilities to play the central role in mitigating climate change that the Inflation Reduction Act (IRA) and other Biden administration energy and climate policies envision. Energy affordability and growing electricity consumption create political limits, although they vary between jurisdictions, on how high electricity rates can go. As the costs of wildfire liabilities and risks increase, other potential investments are being rapidly crowded out of rates.

Utilities also are increasingly unable to insure against the risk of wildfires because of limited availability and high cost of coverage. In California, the three large investor-owned utilities with access to a \$21 billion California Wildfire Fund are still responsible for the first \$1 billion of loss associated with any wildfires that they cause. One might think that insurance coverage would be obtainable for that first loss piece but, in fact, no electric utility finds it possible, let alone cost-effective, to obtain third-party insurance to fully cover its potential liability. In particular, smaller, often municipally- or cooperatively-owned electric utilities are unable to obtain liability coverage at all. For example, in filings to the Hawaii Public Utility Commission (PUC) after the Lahaina Fire, the Hawaiian Electric Company (HECO) disclosed that it carried just \$165 million in general commercial liability coverage prior to the fire, which generated an estimated \$5 billion in property losses, for which the utility may be held at least partially liable.

In this paper, we propose a federal program modeled on California's approach to physical and financial management of utility wildfire risk. The aim of such a program, if enacted, would be to mitigate risks to electricity customers, electric utility shareholders, and the broader housing market, while ensuring that crucial investments needed to reduce greenhouse gas emissions and to manage the growth in electricity demand in the U.S. can occur at reasonable cost.

2. The challenge

Recent catastrophic fires have made it clear that much of the Western United States is exposed to material wildfire risk—including Hawaii and other states that were previously thought to face relatively little danger from wildfire. Climate change, a legacy of landscape management oriented at fire suppression (and in forested areas, timber harvest), and increased development of housing in vulnerable areas have contributed to large increases in loss of life, structure loss, and smoke-related health impacts from catastrophic wildfires (Congressional Budget Office 2022). These impacts are having secondary effects in home insurance and housing markets, effects that risk contagion to the broader economy (Chediak, Wade, and Bake 2024; *Insurance Journal* 2024). Utility-ignited wildfires are a unique and outsized contributor to this problem, leading to some of the most destructive wildfires, with losses that are large enough to significantly affect the financial health of electric utilities in a growing number of states, particularly those in the West.

A. The growing problem of utility-ignited wildfire

Electric utilities have played a notable role in the rise in catastrophic wildfires. Ignitions from utility infrastructure are a small fraction of all wildfire ignitions, but they are disproportionately represented among the most destructive fires. According to the California Department of Forestry and Fire Protection (CAL FIRE), of the 20 most destructive wildfires in California history, seven were ignited by utility-owned power lines, one more (the Woolsey Fire) was found to have been ignited by utility-owned electrical equipment, and still one more (the Tubbs Fire) was found to have been ignited by a non-utility-owned power line on private property (CAL FIRE 2024).¹ In California, among these top-20 structure-loss fires, 52,420 structures were destroyed, out of which power line ignitions accounted for 32,383, or 62 percent of structure losses.² Outside California, many of the most destructive and deadly wildfires have been associated with power line ignitions as the sole or contributing cause.³

There are several factors that make utility-related fires particularly high risk. First, ignitions from utility power lines are highly correlated with the most

dangerous fire weather: Utility-ignited wildfires are much more likely to occur under hot, dry, and windy conditions where fires spread quickly and even timely fire service response is ineffective. Second, power lines are built close to where people live, so fires ignited by utility infrastructure are also more likely to lead to loss of life and structures. Third, under all state utility laws, utilities have an obligation to serve all customers within their service territories, but, at the same time, have no control over local land use decisions that may increase settlement, and required power lines, in places with elevated wildfire risk. In addition, some of the communities at greatest risk of wildfire are those that, like Paradise, California, or Lahaina, Hawaii, were built long before wildfire risk, let alone utility wildfire risk, was considered in the design of communities or individual structures within them.

This pattern of ignitions caused by power lines that either fail in high winds or are knocked to the ground by trees or tree branches began in 2007: The Witch, Rice, and Guejito Fires in San Diego Gas & Electric (SDG&E) service territory were caused by failures of utility equipment in high winds, burned more than 1,300 homes, and killed two people. Subsequent to the 2007 fires, SDG&E asked the California Public Utilities Commission (CPUC) for permission to recover costs associated with enhanced inspections and a wildfire risk reduction program that was the first to include Public Safety Power Shutoffs (PSPSs) (CPUC 2009, 56). After requiring some revision, the CPUC approved SDG&E's request (CPUC 2012, 3) while at the same time declining to apply heightened standards to Southern California Edison (SCE) and Pacific Gas & Electric (PG&E), in the belief that SDG&E's service territory presented unique wildfire hazards. This belief was misplaced.

In 2015, PG&E power lines ignited the Butte Fire, burning more than 900 structures. Then, in 2017 and 2018, PG&E and SCE electrical equipment started large wildfires in both Northern and Southern California, destroying tens of thousands of structures. In 2019, PG&E equipment-ignited wildfires also caused significant damage and death in the Zogg and Kincade Fires. These fires were caused both by failure of aging high voltage transmission lines (Camp Fire, Kincade Fire, Zogg Fire) as well as by damage to distribution

lines caused by vegetation (Napa–Sonoma Fire Siege, Thomas Fire, Woolsey Fire).

Utility-ignited wildfires jumped north of the California border in 2020, with widespread power line ignitions on the evening of September 7, 2020. Both investor-owned (PacifiCorp) and municipally-owned (Lane Electric Cooperative) power lines caused ignitions in high winds that devastated communities in Southern Oregon. Notably, Portland General Electric, which had preemptively implemented wildfire mitigation measures similar to those now required of California investor-owned utilities, opted to turn off its customers' power due to high winds and avoided causing any power line ignitions despite suffering system damage in the high winds.

Then, on December 30, 2021, the Marshall Fire in Colorado was ignited by two sources—one of which was sparks from Xcel Energy power lines that were slapping together in high winds. The fire generated by line slap combined with a fire from another ignition source to quickly burn more than 1,000 structures and kill two people.

Finally, in 2023, power lines owned and operated by Maui Electric Company, a subsidiary of HECO, may have ignited the deadliest U.S. wildfire in the past century, killing 100 people, burning more than 2,200 structures, and devastating Lahaina, the historic former capital city of the Hawaiian Kingdom. Cause investigation is still underway for the Lahaina Fire, but the utility has conceded that its power lines ignited a fire the morning of August 8 (Frosch and Mai-Duc 2024).

The pattern we observe is that utility-ignited wildfire is a growing problem in the United States, appearing where there is both high wildfire risk, such that any ignitions during fire weather can cause high-consequence wildfires, as well as utilities that have not taken effective steps to mitigate and reduce the risk that their power lines will cause such ignitions when wind speeds create unsafe operating conditions.

B. Allocation of liability for utility-ignited wildfire

Legal regimes determining utility liability for wildfires caused by their equipment take two forms: In California, utilities are subject to strict liability for all property losses associated with wildfires they cause as well as for negligence for other losses. Under the state's inverse condemnation framework, utilities are required to compensate owners of property destroyed by utility-ignited fires for the fair market value of the property destroyed (Gradwohl 2020).⁴ In all other states, on the other hand, utilities are held liable for damages associated with wildfires only if such a fire was ignited due to negligence on the utility's part. As long as a non-California utility acted with reasonable care

under the circumstances, even if its infrastructure did cause a destructive wildfire, that utility would not be liable for the damages. As a result, many parties have historically assumed that non-California utilities would be unlikely to be held liable for wildfire-related liabilities. That assumption has now been called into serious question, following a court decision in 2023 related to PacifiCorp and the 2020 Santiam Canyon Fire in Oregon (Urness 2023).

In the aftermath of the 2020 Labor Day Fires in Oregon, a state that has a less stringent standard for wildfire liability than California's standard (Oregon n.d.), PacifiCorp was found grossly negligent and therefore liable for the fires because it had not proactively de-energized power lines during high fire-risk conditions (Haas and Profit 2023; Urness 2023). Appeal of the decision is currently pending, but most legal commentators believe that, while the magnitude of the damage award may be modified, the underlying finding of gross negligence is unlikely to be changed. In essence, an Oregon jury found that PacifiCorp failed to act reasonably because it did not adopt practices first developed by SDG&E and now mandated throughout California for investor-owned utilities. While not every suit relating to the fires was fully litigated, PacifiCorp faces hundreds of millions to potentially billions of dollars in damages as a result (Sicking 2023).

Investigations and litigation regarding the 2023 wildfires on Maui, including the Lahaina Fire, are still at an early stage. Multiple lawsuits alleging that HECO acted negligently by failing to have a program to de-energize power lines during high fire-risk conditions potentially open the utility to billions of dollars in liability (Rothenberg 2023). HECO's stock value has fallen from a pre-fire level of approximately \$38 to a post-fire level of approximately \$13; in addition, it has lost its investment grade credit rating and has lost access to credit markets, and it has retained restructuring experts. Litigation is also pending against Xcel Energy in both Colorado and Texas based on similar claims of utility negligence leading to high-consequence wildfires.

While these different legal regimes—strict liability versus negligence—can be consequential to the finding of liability for an individual fire, recent events indicate that their differential effect on a given utility's actual and perceived exposure to liability in the event of a wildfire may be declining. California's more stringent approach to liability is not the sole reason that California utilities face such significant financial exposure in the case of a wildfire; utilities operating in other states should not assume that their state's legal framework prevents financial exposure to a potentially large degree of liability in the event of a utility-ignited wildfire.

Indeed, it is not clear which regime is better for investors. On the one hand, the strict liability regime in California has produced enormous judgments. On the

TABLE 1

California’s Utility Wildfire Mitigation Playbook

	Step 1: Create situational awareness.	Step 2: Evaluate ignition risk and consequences.	Step 3: Implement power shutoffs or Fast Trip in response to risk.	Step 4: Coordinate to mitigate impacts of reduced reliability to vulnerable customers and local government.	Step 5: Reduce frequency and scope of power shutoffs or Fast Trip necessary for public safety.
Utilities and state regulators	Deploy a comprehensive approach to monitor when and where utility infrastructure is at risk of igniting wildfires (e.g., installing weather stations, investing in meteorological resources, etc.).	Develop a process for deciding, in real time, how to respond to information generated by Step 1, such as when and where it is unsafe to operate electric infrastructure.	Proactively shut down or adjust settings on electric infrastructure during high-risk conditions, and rapidly restore operations when conditions are safe.	Mitigate the negative impacts of Public Safety Power Shutoff (PSPS) events (e.g., coordinating with government and identifying customers with critical electricity needs, providing backup generation and energy storage, etc.).	Invest in infrastructure upgrades and operations that reduce the risk of utility infrastructure igniting wildfires, and reduce PSPS needs.
Step 6: Expand oversight and public insurance.					
California state government	Combine enhanced and standardized governmental safety oversight with public catastrophe insurance.				

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other hand, the recent judgment against PacifiCorp in Oregon raises the prospect of punitive damages being levied against non-California investor-owned utilities. It is now far less clear whether the greater certainty of liability but limited threat of punitive damages in California is better or worse for investors than the regime facing a non-California utility.

Even if liabilities are limited to property alone, utility-ignited wildfires can and are causing losses that are large enough to significantly affect the share value of electric utilities, their ability to pay dividends, the costs of future bond issuance, and ultimately electricity rates that must cover future investment needs, including a fair return to shareholders and bondholders for the risks they incur by investing in utility equity or debt. The scale of losses thus implicates everyone from the funds that decide whether to invest in a particular utility for a lower risk-moderate return tranche of its portfolio to the low-income electricity customer who must allocate their monthly budget between utility bills and other essential expenses.

C. California’s Utility Wildfire Mitigation Playbook

As a matter of both public safety and responsible business practices, we argue that all electric utilities operating in areas where wildfire risk is high should create

and implement plans to mitigate the chance that their electric infrastructure ignites a wildfire, including specific plans to both automatically and manually de-energize (i.e., shut off) high-risk lines when weather conditions increase the likelihood of causing a dangerous ignition. However, not all utilities exposed to wildfire-related liability have created or implemented such plans; of those that have, most have adopted such measures only after a catastrophic wildfire has already occurred in their service territory. The U.S. electric utility sector needs to take a more proactive posture.

In California, utilities have developed a well-established set of risk reduction practices that we refer to as California’s Utility Wildfire Mitigation Playbook (hereafter the “California Playbook”). California investor-owned utilities are mandated to create Wildfire Mitigation Plans (WMPs) according to requirements set by the state, including specific PSPS plans (Office of Energy Infrastructure Safety 2024). Municipal utilities are also required to create WMPs, but these are not subject to review and approval by the safety regulator (California Code 2023). The California Playbook is summarized in table 1.

California utilities and researchers are gathering evidence indicating that these measures, which can substantially reduce the likelihood of ignitions being caused by electric infrastructure, have significantly contributed to reducing utilities’ wildfire risk (Mitchell 2023; Warner, Callaway, and Fowlie 2024). For example,

PG&E found that implementing Fast-Trip settings on high-risk sections of its distribution infrastructure led to a 68 percent reduction in ignitions in those areas in 2022 compared to the weather-normalized 2018–20 average (PG&E 2024, 623). Other California utilities have found similarly promising reductions in ignitions for circuits with Fast-Trip settings enabled (Chen 2024, 338; SDG&E 2023, 264). Although factors like weather trends and the impact of other wildfire mitigation measures make it difficult to gauge the standalone effectiveness of PSPS as a mitigation tool, wildfire risk analysis modeling indicates that the use of PSPS by PG&E, SCE, and SDG&E in October 2019 alone prevented wildfires that could have collectively impacted more than 500,000 people and burned more than 1 million acres (CPUC 2021, 25; Mitchell 2023). While further research and additional data collection is needed to better understand the relative costs and benefits of these tools, the California approach is understood to be successful in mitigating utilities' overall exposure to wildfire risk (Ugboaja et al. 2023). Evidence from California also suggests that the first steps in the California Playbook are relatively less expensive, while later steps are more expensive (CPUC n.d.; PG&E 2022).

The first step in the California Playbook to mitigate wildfire risk is to measure and monitor risk (“Create situational awareness”). This step generally requires deployment of weather stations to measure wind speed at the height of electrical equipment, which is typically 40 feet above ground. These weather stations need to be deployed where wildfire risks and hence utility ignitions are most likely, as opposed to where the National Weather Service has previously deployed its instruments for purposes of operational weather forecasting.

The second step (“Evaluate ignition risk and consequences”) is to develop a process for deciding when it is safe to operate the electricity system in an area and when it is not. This step can take one of two forms: It can either be a process to implement a PSPS—pre-emptively de-energizing lines during unacceptably risky conditions—or a process to modify circuit breakers on power lines so that they will trip and so de-energize lines fast enough to prevent ignitions (often referred to as Fast-Trip settings or Protective Equipment and Device Settings [PEDS]), or both in combination.

Then, in Step 3, a utility must develop the capacity to actually implement a PSPS or deploy Fast-Trip settings in response to changing weather conditions when it has determined that they are warranted (“Implement power shutoffs or Fast Trip in response to risk”). It is important to emphasize that both of these tools need not be deployed over a utility's entire service territory: They are important only where there is high wildfire risk. In practice, most customers of most utilities live in urban areas where one or the other practice may be unnecessary. At the same time, if a distribution circuit

traverses high-wildfire-risk areas to reach a community, then that circuit could still be affected by these operational safety practices.

This is followed by Step 4, developing a process to inspect, repair, and re-energize power lines in a timely manner once dangerous weather conditions have passed (“Coordinate to mitigate impacts of reduced reliability to vulnerable customers and local government”), as well as working on ways to limit potential negative impacts from PSPS events or Fast Trips.

PSPS and Fast Trip plans are proving to be an effective tool to prevent utility wildfire ignitions, but there are significant trade-offs. Deploying both PSPS and Fast Trip balances significant increases in safety with reduced customer reliability and other customer impacts. PSPS events cause adverse effects for customers that lose power when the distribution lines connecting them to the grid are de-energized.⁵ Fast Trip causes unplanned outages when these more sensitive settings cause a circuit to de-energize more frequently due to shorts from animals (e.g., squirrels) or mylar balloons, or vegetation contact (e.g., tree branches) under circumstances that would not have led to an ignition. Utilities that plan to engage in PSPS or Fast Trip to reduce wildfire risk should proactively identify and coordinate with both vulnerable customers and critical infrastructure providers (e.g., water, broadband, cellular communication) to ensure they have working backup power during PSPS events and when Fast Trip is deployed (Step 4).

Backup plans matter beyond individual customers. For example, during early implementation of PSPS in the PG&E service territory, it was discovered that the Caldecott Tunnel, a key transportation artery in the Bay Area, could not be operated without electric power because it needed forced air ventilation to push vehicle air pollution out and fresh air in. PG&E provided portable emergency generators to the California Department of Transportation (CalTrans) to maintain tunnel operation during any future PSPS affecting the tunnel. Similar problems were widespread for many water utilities during the early experience with power shutoffs, but these have been substantially reduced, both by the utilities improving their practices and by affected parties learning to mitigate the potential disruptions. Data from recent years suggest that California utilities' PSPS programs are improving in their ability to reduce risk while minimizing adverse impacts on reliability (SDG&E 2023, 445).

Finally, utilities can attempt to limit the downsides of PSPS and Fast Trip by investing in grid upgrades aimed at minimizing the scale and duration of shutoffs (Step 5, “Reduce frequency and scope of power shutoffs or Fast Trip necessary for public safety”). These investments, often called grid hardening, reduce the risk of ignition. Grid hardening makes it more likely that an overhead electrical system can be operated safely

and reliably in high-wildfire-risk areas during certain dangerous conditions.

Some of these measures, such as the undergrounding of electrical infrastructure, can be expensive and controversial. Others, such as installation of sectionalization devices to break long distribution circuits into smaller chunks that allow for more-targeted de-energization, are less expensive and not terribly controversial once a PSPS program is a given. The degree to which a particular utility engages in Step 5 activities will depend significantly on context, such as what aspects of weather and fuels make operating conditions dangerous and how much the electric utility customers are willing to spend to reduce the reliability impacts of PSPS and Fast Trip.

Because many of these actions require both utility commission approvals to make major capital expenditures and siting approvals for implementation in the field, grid-hardening activities may be subject to substantial delays. To take two examples from California, SCE has decided to primarily rely on insulating wires in high-risk areas to reduce wildfire risk, whereas PG&E has proposed instead to spend more money to underground a large fraction of its system. Both utilities made significant investments in sectionalization prior to taking on these longer-term grid-hardening investments to try to reduce customer impacts from their combined PSPS and Fast-Trip programs.

In addition to the utility-specific steps in the California Playbook (Steps 1–5 in table 1), California created a new system of safety oversight combined with access to a new insurance mechanism known as the California Wildfire Fund (Step 6) with passage of Assembly Bill No. 1054 (AB1054) in 2019 (California Legislature 2019). The safety oversight requires utilities to submit detailed WMPs to a regulator that must certify that the plans meet specified standards. These plans require that electric utilities quantify risk reduction from proposed wildfire mitigation activities as well as the cost-effectiveness of risk reduction investments. Once a utility has approval of its WMP and related implementation, it is issued a safety certification by the Office of Energy Infrastructure Safety (California Utility Code § 8836 et seq.). If the utility has bought into the risk-pooling mechanism, it is eligible to access a \$21 billion pool of claims paying capacity for any wildfire liabilities exceeding \$1 billion that occur in the year covered by the plan. This pool of capital is funded 50–50 by ratepayers and utility shareholders (California Public Utilities Code 2022, §§ 3281–3289).

Most states in the West do not require anything so detailed and comprehensive as the plans prepared by investor-owned utilities in California, but some utilities have followed the California Playbook and created plans analogous to WMPs, and some also include PSPS plans. Some have even made their plans publicly available where they are not required to do so, to convey

their mitigation efforts to stakeholders including customers, regulators, and investors.

In other work (Macomber, Wara, and Mastrandrea 2024), we present a comparison of utilities' mitigation plans across the West in terms of the California Playbook, since we believe that having comparative information of this type publicly available will help to inform utilities', investors', and regulators' decision-making processes, and ultimately will lead to more-successful and more-efficient mitigation of wildfire risk. We find that, while a number of investor-owned and municipal utilities have taken the steps we outline above, far too many that face significant wildfire risk in their service territories have not visibly taken even the most basic steps to mitigate the risk of utility-ignited fires.

D. Growing consequences of a failure to manage utility wildfire risk

Several municipal and investor-owned utilities outside California have faced financial distress after catastrophic wildfires, including PacifiCorp, Lane County Electric, and HECO. Xcel Energy may yet face significant liability as well, depending on outcomes associated with the Marshall Fire litigation. Many utilities across the West face significant exposure to wildfire risk that threatens utilities' ability to secure investment and enter into long-term contracts.

This failure to mitigate risk has consequences. As utilities and utility partners take steps to implement provisions of the IRA, many are finding that it is challenging, if not impossible, to pursue share and bond issuances on favorable terms because of perceived risks. Owning electric utility stock is not supposed to be exciting: It is supposed to be the investment of “widows and orphans” who seek a reasonably safe and reliable return (Hayes, Anderson, and Rohrs Schmitt 2022). Utility-ignited wildfires pose a material threat to that investment thesis, and the markets are noticing: Costs of new debt and equity issuance are increasing accordingly. Moreover, investors are so far not distinguishing between utilities that have acted to mitigate risk and those that have not. This compromises the societal goal—implemented via state utility codes and the Federal Power Act (FPA)—of using utility regulation to create entities that markets perceive as low risk and so are investable at a lower rate of return than would otherwise be possible.

Because of the regulatory regime in which electric utilities operate—as state-chartered monopolies subject to cost-of-service regulation—they have only a limited ability to pass these higher costs on to their customers. Utilities require permission from their regulator before including costs they incur in the prices

they charge to their customers. In general, utilities may only charge customers for costs that were prudently incurred. Subsequent to a disallowance, or denial of so-called cost recovery—i.e., the passthrough of costs to electricity customers—in 2017 by the CPUC for liabilities associated with a wildfire ignited by SDG&E in 2007, this passthrough of wildfire costs has been in doubt (CPUC 2017).

This risk of disallowance is particularly acute where evidence obtained after a wildfire suggests that a utility failed to take prudent actions to reduce the chance that its power lines would ignite wildfires under dangerous conditions. Although the legal standards for operational prudence in the utility context are distinct from those for non-negligent behavior under tort law, the concepts are closely related. Thus, a utility that a court finds to be negligent for acts leading to ignition of a wildfire may face difficulties in recovering costs from its regulator for these expenses because those costs may be held not to have been incurred prudently.

And, of course, even if a utility regulator disallows passing through the costs from a particular fire, costs to customers can go up: The act of disallowing these costs will raise the risk of returns to owning that utility's debt and equity, thereby leading to a need to pay investors a higher return on their invested capital, thereby leading to higher rates for electricity customers. Passthrough of costs from unmitigated wildfire risk could lead to skyrocketing electricity costs either via liabilities that are allowed to be incorporated into rates or from increases in cost of capital due to disallowance of these liabilities, or a mixture of both. Through these mechanisms, the costs of past wildfires and the perceived risk of future wildfire liability fundamentally

threaten energy access and affordability. The impacts on electricity bills will be felt even more acutely by low- and moderate-income households, given that electricity rates tend to be highly regressive.

Of course, the financial consequences of structure losses due to wildfire are not limited to electric utilities and their customers. Particularly in California, but also in other Western states, problems with availability and pricing of homeowners insurance coverage are increasingly acute. Homes offered for sale in high-risk areas can enter into contract but then be left unsold because the buyer cannot secure homeowners coverage that is required by the mortgage issuer, or because they cannot secure coverage at an affordable price, consistent with the mortgage originator's requirements regarding housing cost-to-income ratio. When they are unable to obtain insurance through a regular insurance company, homeowners and businesses in California can purchase insurance through the FAIR Plan, the state-mandated insurer of last resort (California Department of Insurance n.d.).

The brewing crisis in the homeowner insurance space in California and other jurisdictions creates real macro-contagion risk from electric utility-ignited fires. California has had two "good" years without substantial loss events associated with wildfire—utility ignited or not. Were it to suffer a major loss due to a utility-ignited wildfire, both private insurance companies and the FAIR Plan would be affected. For example, if claims paid by the FAIR Plan exceed the ability of the California Wildfire Fund to cover losses, it is far from clear that the FAIR Plan could avoid being rendered insolvent, with large knock-on effects to its broader real estate and housing markets.

3. The proposal

Our policy proposal is for a federal utility wildfire safety program paired with catastrophic insurance for utility-ignited wildfires. Given the strong linkage of structure loss to electric infrastructure, one of the most effective steps that the United States can take to avoid losses that will threaten insurance and broader real estate markets is to make sure that electric utilities are on a sound footing with respect to their wildfire mitigation as well as to their risk transfer for truly catastrophic losses if and when they do occur. In this section we propose a federal program modeled on California's approach to physical and financial management of utility wildfire risk. The aim of such a policy, if enacted, would be to mitigate risks to electricity customers, to electric utility shareholders, and to the broader housing market, while ensuring that crucial investments needed to reduce greenhouse gas emissions and to manage the growth in electricity demand in the United States can occur at reasonable cost.

A. What a proposal to better manage utility wildfire risk needs to deliver

As described thus far, electric utilities are a major contributor, if not the most salient contributor, to growing wildfire catastrophes in the United States. We emphasize that electric utility infrastructure is not the only cause of these catastrophes, but, given U.S. liability frameworks for wildfire, which assign all liability for a wildfire to the ignition source, electric utilities are the actor likely to pay for wildfires ignited by electric infrastructure.

Wildfire-related losses are leading to rising electricity rates and infrastructure financing costs; they also threaten home insurance availability and pricing, thus posing risks to housing markets and the broader economy. A policy proposal that aims at stabilizing this situation must deliver two key outcomes. First, it must offer strategies to fundamentally reduce the likelihood that U.S. electric utilities will be the ignition source of lethal and destructive fires. Second, it must also create conditions under which markets will be confident that, despite the growing impacts of climate change on wildfire risk, utilities will not face bankruptcy due to

missteps or misfortune that can and will likely occur in the implementation of better safety practices.

To meet these objectives, we propose that utilities in other states and their regulators apply the California Playbook summarized in table 1 in the context of their service territories and for the federal government to create a large catastrophic risk pool that can pay claims from eligible wildfires (i.e., a federal Utility Wildfire Fund similar to Step 6 of the California Playbook). In order to gain access to this claims-paying capacity, a utility would need to implement Steps 1 through 4 of the California Playbook. We propose that grid hardening (Step 5 of the California Playbook) not be an explicit requirement for access, but that it be left to the discretion of a given utility and its state regulator. See figure 1 for a visual representation of this playbook.

The federal program we propose would dramatically improve safety while at the same time improving investor confidence that a utility that acts prudently with respect to its wildfire risk will nevertheless not be thrown into insolvency by bad luck. Our proposal, if enacted, has the potential to reduce upward pressure on rates, preserve the ability of utilities to invest in and construct new clean energy infrastructure, and significantly derisk homes and their mortgages in fire-prone areas of the United States, stabilizing both insurance and real estate markets as a consequence.

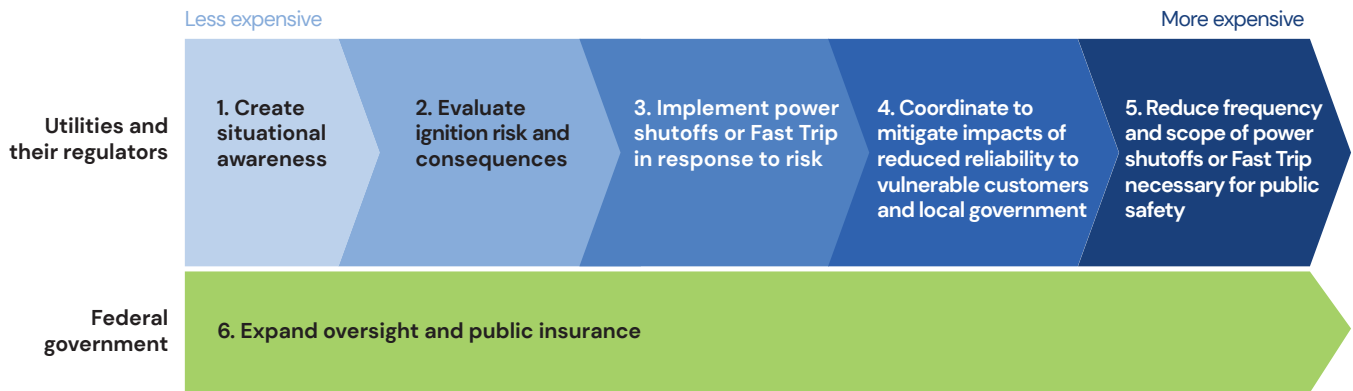
Key details for such a policy are how minimum standards are created and enforced, the balance of state and federal authority in making decisions that will impact both costs and reliability of electricity, the mechanism for creating a catastrophic risk pool, the necessary size of such a risk pool, and who pays to fund the claims-paying capacity needed to create the risk pool. In what follows, we suggest issues to consider in answering these questions and provide preliminary thoughts on them.

B. Minimum standards for federal utility wildfire safety regulation

A key component of any federal safety/insurance mechanism for utility-ignited wildfire is the creation of a safety regulatory process for electric utilities to

FIGURE 1

The Federal Utility Wildfire Mitigation Playbook



Note: Step 5 of this playbook is not required for utilities to gain access to the federal Utility Wildfire Fund, but rather, is left to the discretion of a given utility and its state regulator.

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ensure that all utilities eligible for federally-provided catastrophic insurance meet minimum safety standards. We propose that substantive compliance with a version of the first four steps of the Playbook (see table 1 and the above discussion) constitute a workable minimum standard, in that evidence from California indicates that these steps are both affordable and will substantially reduce the risk of utility ignitions. We believe that Step 5 of the Playbook (i.e., modifications to the grid to harden it) is likely to be much more context-specific, both in terms of what steps are appropriate and in terms of willingness of jurisdictions to pay the costs of expensive steps that, in the end, serve to improve reliability as much as increase safety; we thus propose that this step not be required in order to meet the workable minimum standard.

Minimum safety standards are a non-negotiable requirement for any risk-pooling mechanism or federal catastrophe insurance framework because, without it, utilities and home insurers will face little incentive to push for reductions in loss. As climate change worsens and the wildfire threat grows, an absence of minimum standards could increase losses such that the viability of the insurance mechanism is threatened.

In our view, there are a number of potential federal authorities that might step into the role of wildfire safety regulator. Conceivably, such a regulator could be placed within the Federal Energy Regulatory Commission (FERC), the North American Electric Reliability Corporation, or the U.S. Department of Energy. A new office, perhaps one modeled on the National Transportation Safety Board, might be housed within one of these entities. Each of these agencies has different capacities and responsibilities that might make it an appropriate regulator of electricity system wildfire safety. None has precise experience in managing the

large number of submissions that would have to be evaluated and certified on a regular basis. All of these entities would need to develop substantial new regulatory capacity to manage this role.

WMPs have proven to be a crucial component of state-level wildfire mitigation planning. But evaluation of their quality is time-intensive and requires significant expertise in risk quantification and management, electric utility operations, and wildfire behavior. This authority would be responsible for setting standards for wildfire mitigation planning and implementation, for review and approval of plans, and for auditing compliance with plans. Creation of these plans would require new expenditure by both the utilities preparing the plans and the regulator that reviews them. Utilities would need to get authorization from their state PUCs before incurring these costs. Congress would need to authorize expenditure of federal resources to review the plans.

We propose that a federal WMP process be created that allows electric utilities to voluntarily submit, and have certified, plans that address each of the first four steps required to gain entry to the fund. We suggest that electric utilities not be *required* to submit such plans for review and approval, but that they be *allowed* to do so. As is typical of many federal regimes governing electric power, participation by electric utilities should be voluntary.

These proposed plans would develop and document the four Playbook steps: (1) situational awareness of wildfire risk, (2) a process to identify unacceptable risks in real time if and as they occur, (3) a process to respond in real time to unacceptable risk via a combination of PSPS and Fast-Trip settings, and (4) a requirement to coordinate with impacted local governments, critical infrastructure providers, and vulnerable

customers to manage a narrow set of impacts from temporary loss of power.⁶

By limiting the authority of a federal regulator to lower-cost, more-easily verifiable actions aimed at avoiding unacceptable risk of catastrophic wildfire, such an approach would still leave states largely in control of both their overall electricity system costs and their approach to the more costly wildfire risk reduction measures, such as insulating or undergrounding electrical wires. This would also leave states largely in control of the extent to which utilities pursue other activities to reduce the impacts on reliability of PSPS and Fast-Trip settings.

In general, state PUCs have jurisdiction over utility expenditures in the distribution system, while FERC has jurisdiction over utility expenditures in the transmission system. Wildfire risk exists in both. We argue for a federal safety regulator (rather than reliance on many state safety regulators) because this safety oversight role must have aligned incentives with the solvency of any insurance mechanism. If each state regulates its own utilities' safety practices but can take advantage of a federal insurance backstop, it might be tempted to underspend on safety because it can rely on its self-certification of utilities that allow them into the insurance mechanism. Most other Western states cannot adopt the California model—state-level safety certification and insurance mechanism—because they cannot raise sufficient funds to create an insurance backstop of sufficient size to create market confidence that it will cover most expected losses.

WMP development by utilities would, to a lesser or greater extent depending on context, impose costs on electricity customers in low-risk areas for the benefit of electricity customers in high-risk areas. All customers of a given utility would pay for the design and implementation of these plans. On the other hand, all customers, not just those in high-risk areas, stand to benefit from the lower risks and hence lower financing costs that such a policy would help to support for utility investments. Nevertheless, it is the case, even in the more rural Western states, that the majority of customers live in urban areas that are generally at lower risk from wildfire. In the end, the degree to which the costs of utility wildfire risk are borne by the customers that live in high-risk areas as opposed to all customers of a utility is a policy and electricity rate design question for state utility commissions to resolve and is beyond the scope of this proposal.

This proposed system would differ from the one created by AB1054 in California that is currently overseen by the Office of Energy Infrastructure Safety in limiting oversight to a narrow subset of risk-reducing actions that are less expensive, more easily verifiable, and less subject to discretion than the very lengthy plans that California investor-owned electric utilities

must prepare. It would also differ in that plan development and submission would be voluntary.

Each participating electric utility would need to prepare a plan submission each year, and the wildfire safety regulator would need to review and approve plans, require plan revision as needed, and audit compliance with approved plans on an annual basis. Compliance audits and monitoring would allow for a continual process of improvement in safety practices and outcomes. Initially, development of these plans would require significant effort on the part of electric utilities, but that effort would fall over time as required measures are fully implemented and as plan submission evolves from initial development and implementation of compliance measures to maintaining compliance using existing policies and tools.

For the purposes of the insurance mechanism described in the next subsection, annual review of plan submissions and substantive compliance with the plans submitted is important. It is not enough to say that certain activities, particularly the operational changes described above in the first four steps of the Playbook, are planned. It must also be clear that utilities have all procedures in place to comply with their submitted plans, and that they actually do so when confronted with high wildfire risk conditions. Otherwise, it might be tempting to submit a plan without the intention or ability of actually following through on it, given its costs and reliability impacts.

Development of these plans would be voluntary but would be incentivized by the fact that failure to submit a plan or failure to receive approval of a plan would raise concerns on the part of credit rating agencies, investors, and state regulators. It is very likely that a voluntary program of this sort would in practice be a requirement, given the risks that utilities face: Possession of an approved WMP and evidence of compliance with it would substantially reduce risk of catastrophic wildfire, while at the same time reducing the risk of negligence liability for a utility-ignited wildfire if one did occur. In contrast, absence of such a plan would place the utility at risk of large liabilities and would expose it to higher costs of capital and debt. These factors would also almost certainly induce state utility commissions to approve expenditures necessary to prepare and implement WMPs.

In addition, in the next subsection, we propose a further inducement to create such plans: establishing submission of such plans to a safety regulator and certification by that regulator as a prerequisite for access to a federal Utility Wildfire Fund providing catastrophic wildfire risk insurance for electric utilities. We anticipate that these factors would make the costs of not participating greater than the costs of participating.

C. Catastrophic risk insurance for utilities that meet safety standards

A key incentive for utilities to submit WMPs for review and approval under our proposal would be access to a new federal Utility Wildfire Fund, a catastrophic risk pool to manage wildfire losses from utility-ignited wildfires if they did occur. Modeled on the California approach, access to this catastrophic risk pool would be possible for a utility only if it caused a wildfire in a year for which it had an approved WMP with which it was in compliance. Key design questions for such a fund are (1) Who gets access? (2) What is the attachment point (threshold) above which the fund would pay for losses? (3) How big should the fund be? And (4) Where do the financial resources come from that create claims-paying capacity? We next discuss these four issues in turn. We emphasize, based on our own involvement in developing the California Wildfire Fund, that decisions on any of these issues are not independent of each other and will impact decisions on the other issues.

1. Who gets access?

As discussed above, a federal Utility Wildfire Fund would need to condition access on taking a set of steps to reduce any participating utility's risk. This condition is fundamental because, without it, utilities would be tempted to avoid investment in mitigation measures both because they cost money the utility would either prefer not to spend or prefer to spend in other ways, and because these investments could create tensions with their regulators. Turning off the power in dangerous fire weather, though proven to dramatically reduce risk, is certain to also have impacts on reliability that will frustrate and anger customers and potentially negatively impact a utility's most important relationship—the one it has with its economic regulator.

Time and time again, utilities, in consultation with their PUCs, have opted not to implement the kinds of safety measures that hard-earned experience—and tragedy—teach are essential for avoiding wildfire risk. For example, HECO's WMP, which HECO did not release until after the Lahaina Fire, indicates that HECO opted not to use PSPS because the practice was "not well received by certain customers affected" (HECO 2023, 11). The fact that many utilities do not even have a process for determining when it is dangerous to operate their infrastructure and a process for proactively de-energizing infrastructure when the risks are unacceptably high is itself telling. What other private industry would behave in that fashion, especially after the disasters of the past decade and the liabilities these

have created? For example, after the Exxon Valdez and the Deepwater Horizon disasters, the U.S. oil industry made significant changes to its safety and operational practices to reduce the chances that either disaster would ever happen again. A federal fund that preconditions participation on a utility making the safe/unsafe conditions determination and then actually acting on that determination, has the benefit of taking this process, to some degree, out of the hands of the regulatory process, which can and sometimes does have different incentives.

Our proposal helps reduce concerns regarding free riders who might benefit from greater investment by some utilities in grid hardening because it focuses on key operational measures (including PSPS and Fast Trip) that utilities can take to reduce the risk of ignitions, rather than the grid-hardening measures that are taken to reduce the reliability impacts of these operational changes. Free riding is avoided by a focus on well-defined, easily observable operational measures that are fast to implement rather than the large variety of grid-hardening options that need to be applied in a highly context-specific manner, that vary widely in cost, and whose effectiveness is also context specific.

There is a reasonable concern in a risk pool such as the one we propose that not all actors will be similarly situated with respect to the risk. We believe our proposal minimizes this risk because the steps we are suggesting for utilities to take are largely objective and low-cost, and because they involve a trade-off between safety and reliability. Utilities and their commissions may seek to reduce that trade-off by investing in new equipment to improve reliability even under dangerous fire weather conditions, but that does not change those utilities' overall risk profile within the set of voluntarily participating utilities.

We emphasize that submission of these plans and evidence of their implementation should be voluntary. Utilities would be free to choose not to participate, although of course they would not be free from the investment consequences of that choice. We recommend that only utilities with WMPs that the federal safety regulator has approved and that have a compliance audit for their previous WMP be allowed to claim against the Utility Wildfire Fund for any given year. Thus, participation in the insurance pooling mechanism would be voluntary and would create a mix of costs and benefits that each utility and their regulator or governing body could evaluate to decide if participation were in its interest. A key issue for inducing participation in this insurance mechanism will be setting the contribution—from both ratepayers and shareholders—at a level that is high enough to be meaningful in terms of creating a sizeable insurance backstop, but that is also scaled in a way that allows for participation by utilities of different sizes and with different ownership structures.

2. What is the attachment point (threshold) above which the fund would pay for losses?

In addition, to create strong incentives for utilities to go above and beyond the minimum standards set by the federal wildfire safety regulator, the attachment point (i.e., the level above which the insurance mechanism would pay for losses, similar to the deductible on a consumer insurance policy) of the catastrophic risk pool for any given utility would need to be set high enough to create strong incentives to invest in wildfire safety. On the one hand, the federal Utility Wildfire Fund would need to leave participating electric utilities with “skin in the game” sufficient to motivate them to strive for operational excellence even as the fund protects them from extreme and hopefully unlikely outcomes. On the other hand, if the attachment point for the fund were set too high, or in a way that does not take account of the enormous variation in size and hence claims-paying capacity of electric utilities, many utilities, especially smaller ones, will be unable to or will opt not to participate.

Where this attachment point lies varies enormously between electric utilities, with the largest investor-owned utilities capable of insuring or self-insuring risks on the order of \$1 billion while smaller municipal and cooperative utilities possibly incapable of managing risks on the order of \$10 million. The best practice here would be to set a metric that can vary either by the number of customers a utility has or by its annual revenues, generally referred to by electric utilities and their regulators as the “revenue requirement.” Without suggesting exactly how to specify the point at which a catastrophic insurance fund would kick in to cover losses, we believe that this point should vary as a function of the size and internal claims-paying capacity of participating utilities. In this way, all utilities, regardless of size, would see value in participating. As one potential starting point, we suggest taking the ratio of the average of the revenue requirements of the three large California investor-owned utilities to the \$1 billion attachment point for the California Wildfire Fund. Determining whether this degree of retained risk is too high or too low when scaled to smaller utilities based on either customer count, revenue requirement, or some blend of the two, would benefit from substantial additional stakeholder input and might also depend on availability and price of commercial wildfire liability coverage for electric utilities.

3. How big should the fund be?

Most insurance companies are required by their state regulators to maintain sufficient claims-paying capacity to remain solvent through a 1-in-100-year

loss. Many maintain greater loss coverage ratios via reserves and purchase of reinsurance products. In any case, under ideal circumstances the fund should maintain sufficient resources to cover a 1-in-100-year loss, with some provision to replenish resources in the event of claims on the fund. Since the first losses due to any covered wildfire would be the responsibility of the utility that caused the fire, the fund would require less capital than it otherwise might.

At the same time, there remains significant uncertainty about what a 1-in-100-year loss might be for the Western United States due to a utility-ignited wildfire. Insurance catastrophe models are not well poised to estimate this loss because they target all potential losses, not just those from utility-ignited wildfires. In addition, most catastrophe models are designed to estimate losses this year rather than over a longer timescale—perhaps one to two decades—where the impacts of climate change on wildfire are likely to be significant.

Whatever insurance catastrophe models indicate, the correct number will likely be lower once all participating utilities implement the safety practices required in their WMPs. Quantification of the risk reduction value, based on experience in California of reduced probability of ignition due to a combination of PSPS and Fast Trip, can guide scaling of the insurance mechanism to reflect the mitigation efforts of participating utilities (see discussion in section 2C). The roughly correct answer might be derived from modifying insurance industry catastrophe models to focus only on expected losses from utility-ignited wildfires and then incorporating an estimate of risk reduction associated with PSPS and Fast Trip.

One reference point for thinking about size is the California Wildfire Fund. This fund was designed prior to the advent of most utility mitigation measures and was intended to cover wildfires that might occur over a 10-year period in California. In that case, a \$21 billion fund was considered adequate to cover the 1.3 million residential structures in California at risk of loss from wildfire. This compares to approximately 2.6 million residential structures at risk from wildfire in the Western United States (CoreLogic 2023, 5). A federal wildfire insurance mechanism would thus need to be roughly twice as large as the California fund in order to provide a similar degree of coverage across the Western United States. Still, it might be smaller than this because it could be designed with more-precise information regarding the risk reduction value of interventions, such as PSPS and Fast Trip, that reduce the number of utility ignitions in high-risk areas.

4. Where does the money for a Utility Wildfire Fund come from?

The source(s) of funds for this risk-pooling mechanism is a critical feature of the policy, both from a durability and investor confidence perspective and from a political feasibility perspective. At the highest level, the beneficiaries of the fund should be willing to pay for its existence. The three beneficiaries are ratepayers, utility shareholders, and taxpayers.

Our view is that at least three sources of funding should be considered. First, participating utilities should be charged an access fee that could be recovered from shareholders over a reasonable period of time. Such a fee would have to be scaled to reflect both the size of a utility and its degree of risk, after mitigating its risk via implementation of the Playbook. We argue that the best approach would be to explore with potential participants what a fair shareholder contribution should be that takes account of differences in size and in residual (post-mitigation) risk. How exactly this shareholder contribution would be divided among participating utilities would need to be resolved via discussions between potential participants. One point worth making unequivocally is that the shareholder contribution to the Utility Wildfire Fund should be substantial.

Shareholders benefit enormously from the creation of a pooled Utility Wildfire Fund because it aligns their actual investment returns with what PUCs will allow in rates in terms of return on equity. A modest reduction in dividend to shareholders is well worth the price of avoiding a bankruptcy filing or a less extreme but perhaps more likely outcome of needing to dilute existing shares in order to finance new infrastructure investments on unattractive terms. This fee could be recovered from shareholders either as a lump sum to initiate eligibility to submit a WMP to the safety regulator, or in annual premiums, or through a combination of the two. While it is likely that such an obligation placed on shareholders over time could result in requests for greater allowed rates of return—effectively recovering these costs from customers—we believe that this would be counterbalanced to some degree by the reduction in rates of return that creation of a wildfire fund would make possible. In other words, upward pressure on rates of return from the required shareholder contribution to the Wildfire Insurance Fund would be more than counterbalanced by the derisking of participating

electric utilities and the consequent downward pressure on rates of return that this creates.

Second, ratepayers should contribute to a significant degree. Ratepayers benefit from the existence of a pooled Utility Wildfire Fund because they will be safer, they will pay lower utility financing costs (debt and equity), and because healthy utilities will provide superior services. The latter point is only becoming more important as the electricity system decarbonizes, and as transport and buildings electrify. We argue that simplicity and real and perceived fairness mean that ratepayers from all eligible and participating utilities should pay a single, fixed, per kilowatt hour charge for their contribution. We recommend that principles of fairness and equity between electricity ratepayers and shareholders mean that the contributions should be of roughly equal value, with the ratepayer contribution financed via a non-bypassable charge that is recovered over 10 to 30 years and with the shareholder contribution financed by a mix of an upfront contribution and quarterly contributions over 10 years. This approach would minimize bill impacts for participating utility ratepayers while allowing for substantial early contributions to the claims-paying capacity of the fund.

Finally, taxpayers should be willing to contribute to the fund. It is important to note that taxpayers and ratepayers are not the same. Because taxes are generally progressive but rates are highly regressive, the burden of taxpayer versus ratepayer funding is distributed quite differently across income classes. We propose that a taxpayer contribution to a federal Utility Wildfire Fund could be similar to the taxpayer contributions to the Price-Anderson Nuclear Industries Indemnity Act structure, whereby taxpayers pay claims only once other resources are exhausted. In this way, utilities would bear responsibility for an initial self-insurance layer, followed by a layer up to 1-in-100-year⁷ pooled coverage that is contributed by a 50-50 split between participating utility shareholders and ratepayers, followed by a final layer, up to some limit, perhaps a consensus estimate of the 1-in-200-year loss, where taxpayer liability would exist. This contribution of risk transfer capacity from taxpayers could be contingent—that is, it would be called on from the federal purse only in the event that an event in excess of 1-in-100-year loss actually occurred. This would minimize any near-term impact on expenditures while also placing the full faith and credit of the federal government behind a layer of additional risk transfer.

4. Questions and concerns

1. Should liability rules be altered for claims to the proposed Utility Wildfire Fund?

The Price-Anderson Nuclear Industries Indemnity Act and the Terrorism Risk Insurance Act (TRIA) both create strict liability regimes governing compensation for the covered events. They are “no fault” in the sense that, if there is a nuclear accident or if there is a terrorist attack, both programs pay all eligible, adjusted claims until claims-paying capacity is exhausted. Because the proposed Utility Wildfire Fund would cover utilities and not the victims of utilities for liabilities associated with utility-ignited wildfires, the same cannot be the case for this proposal. In particular, our proposal leaves open the possibility that a utility might non-negligently ignite a wildfire and be found to have no liability because it had acted reasonably. This would mean that insured and uninsured claims could not recover from the Utility Wildfire Fund.

If the federal government is to provide a backstop to this risk for electric utilities, one has to at least ask whether a move to a strict liability regime makes sense because it will facilitate more-rapid claims payment for victims of utility-ignited wildfires. Too often in the past decade, communities have been devastated by utility-ignited wildfires, only to enter an extended purgatory while victims wait years for payment of claims from utilities as litigation and/or bankruptcy plays out. Given the federal infusion of funds via a contingent liability, and the precedents set by prior federal insurance schemes, it is at least worth considering whether a federal Utility Wildfire Fund ought to be structured to pay all eligible adjusted claims, regardless of whether the participating utility was negligent, or, in the terms of utility ratemaking, prudent.

In our view, there are arguments that cut both ways. On the one hand, a move toward prompt adjudication and adjustment of claims holds tremendous value for the communities that are destroyed by wildfire; such a move is arguably in the public interest for that reason alone. Chronic homelessness is a common after-effect of wildfire in rural communities where litigation drags out for years.⁸ Often, this process takes so long that community integrity is permanently damaged because former residents have no choice but to

leave and seek new lives elsewhere while they wait for a settlement check.

On the other hand, providing strict liability protection to wildfire victims will also reinforce other dysfunctions in the U.S. system of wildfire and land management. In particular, local governments currently face relatively modest incentives to engage in sound community planning to manage wildfire risks, and residents who underestimate risk often push those governments not to enforce defensible space codes or invest in improved fire protection. If the federal Utility Wildfire Fund will pay for all losses associated with one of the main causes of wildfire structure loss, this will further weaken already suboptimal incentives for local governments and property owners to take steps to reduce their own risk.

In addition, if a federal program sought to impose strict liability on covered utility-ignited wildfire events, it would necessitate modifications to state tort law since, below the attachment point, state tort liability would presumably apply. It would be unworkable for simple negligence to be the standard of liability below the attachment of the fund but strict liability to be the rule above. Thus, concern for respecting state law regimes and the development of standards of care with respect to utility-ignited wildfire mitigates against a federal strict liability regime.

2. What if utilities in high-risk areas do not participate?

Non-participation in a federal wildfire safety and insurance backstop might occur if the costs of participating exceed the perceived benefits. This occurred in California for smaller municipal utilities that face high wildfire risk but for whom both the attachment point and cost-share to the California Utility Wildfire Fund were prohibitively high. We believe that widespread participation would be encouraged by utility shareholders, bondholders, and credit rating agencies—but that the “right” levels for these two critical parameters will have to be worked out by negotiations between stakeholders in a detailed design process. Setting these key parameters needs to strike a balance between creating accountability for good safety

practices and leaving utilities with too much residual risk exposure and between charging a fair price for the federal backstop and making the cost so high that it undermines the economics of firms that provide essential services to society. There will also be some utilities for which the cost of participation does not make sense because these utilities do not have sufficient wildfire exposure. We believe that market signals will push utilities with risk in their territories toward participation where it is justified by risk. That said, a voluntary program creates the possibility that some investor-owned utilities, municipal utilities, and electric cooperatives would opt not to participate even when it might be societally optimal for them to do so.

3. Why make this program voluntary?

We believe that a voluntary program is essential because not all utilities face the same, or even any, wildfire risk. Some utilities, and their owners, may make a rational calculation that the costs of participating, both in terms of wildfire mitigation and the buy-in to the fund, do not justify the benefits. This would make sense for utilities with little-to-no wildfire risk in rural parts of their service territory or for utilities that serve an urban area. At the same time, a system that is voluntary allows for adjustments in these cost-benefit tradeoffs as wildfire risk increases over the next 10 to 20 years, in line with climate modeling projections. In addition, forcing all utilities in the United States to participate in such a federal scheme would violate a long-held separation in the electric regulatory space between federal and state authority. In general, the federal government under the FPA has been limited to interstate and wholesale electric power issues while states have retained plenary authority over all else. FERC has repeatedly declined to exercise jurisdiction over activities that it is legally permitted to regulate under the FPA in order to avoid interfering in areas of traditional state regulatory authority. We believe that respecting that tradition, by making participation in a combined safety and insurance backstop voluntary, would facilitate adoption and take-up of this policy proposal. By contrast, imposing a safety regulatory system upon the distribution systems of many electric utilities would fundamentally alter the balance of state and federal authority in the electricity regulatory space.

4. How can we build a more robust evidence base for the mitigation efforts in the Playbook?

Evidence regarding the value of individual mitigation activities as well as different combinations of mitigation activities is urgently needed across the service

territories where they are being deployed. To date, most of these data are available in California for two important reasons: First, California requires reporting of all but de minimis utility ignitions to CPUC and makes these data readily available to all researchers. No other states have this data reporting requirement. Availability of this critical outcome variable has been essential to testing the effectiveness of various interventions to reduce risk. We recommend that all states considering wildfire risk require this of all utilities operating in their jurisdiction so that the impact on utility ignitions of various measures can be tracked in as many contexts as possible. Second, efforts to mitigate these risks are nascent. Prior to 2017, only one utility in the United States, SDG&E, had invested significant resources in avoiding ignitions. All others simply accepted some degree of ignition risk as a cost of doing business. The field is new. Commissions and governments should encourage much more work both by utilities and by the Electric Power Research Institute, as well as by outside researchers, to understand the costs and benefits of interventions to reduce utility ignition.

5. How might the Playbook evolve over time?

Over time, the Playbook will certainly evolve both as new technologies are deployed and as the effectiveness of different combinations of technologies are better understood. A federal safety regulator would ideally create a process of continuous evaluation and improvement focused on identifying the set of operational practices that most cost-effectively reduces risk of utility ignitions. Such a process would allow for introduction and propagation of new ideas that better protect customers and communities from the consequences of utility ignitions. Creating such an iterative, continuous improvement process is something that the electric utility industry has implemented quite successfully for nuclear power plant operations. Subsequent to the Three Mile Island nuclear accident, the Institute of Nuclear Power Operations (INPO) was created by the industry. INPO has driven major improvements to operational safety of nuclear power plants in the United States that had the unintended consequence of also dramatically improving the reliability, availability, and hence value of these assets.⁹ A wildfire safety regulator should engage in continuous evaluation of both utility ignitions and the effectiveness of efforts to avoid them. It should also be open to proposals from electric utilities or other stakeholders for changes to the Playbook that improve safety or mitigation cost-effectiveness.

5. Conclusion

Municipal, cooperative, and investor-owned utilities are facing a crisis of both market and customer confidence in the Western United States that fundamentally threatens their ability to provide affordable, safe, and reliable service. Evolving climatic conditions have led to rapidly increasing wildfire risks, especially fires caused by electric utility ignitions; these ignitions, at least in California, are responsible for more than 50 percent of structure losses in the largest fires. Many of the recent largest loss events due to wildfire outside California are also attributable in whole or in part to utility ignitions. As a consequence, utilities are increasingly viewed as risky investments, driving up their cost of capital and threatening their ability to execute on grid upgrades necessary to deliver on the promise of the IRA and other state and federal policies aimed at reducing greenhouse gas emissions in the power sector and electrifying transport and other energy end uses. Home insurance markets, driven in large part by losses associated with these utility-ignited wildfires, are under strain both in terms of availability of coverage and of affordability of any coverage that is available.

We have argued that a modest utility wildfire safety requirement used as a condition of eligibility to participate in a risk-pooling mechanism for utility-ignited

wildfire losses could do much to both reduce risk and to manage it more effectively. In this paper, we have described what we believe, based on experience with similar programs in California, to be crucial characteristics of such a program as well as questions that would need to be addressed during stakeholder-informed development of a detailed policy proposal. Unfortunately, unless Congress acts to create much stronger incentives for risk reduction and a safety net for communities that are harmed, we are likely to see more incidents like those that devastated the town of Paradise in California, communities in the Santiam Canyon in Oregon, or the city of Lahaina in Hawaii.

We believe that such catastrophes are preventable in other utility jurisdictions but that an effective prevention strategy that gets ahead of this problem will require a new approach, outlined here, that both imposes requirements to adopt the basic elements of the Utility Wildfire Playbook as we describe it, and provides an incentive to do so in the form of catastrophic risk insurance for electric utilities. Taking these steps is in the national interest in that failure to do so threatens both the viability of U.S. climate strategies, at least in wildfire-prone regions, and puts housing markets at risk due to lack of home insurance availability.

Endnotes

1. While the cause of the Dixie Fire is still officially under investigation, it is widely understood that it was ignited by utility-owned power lines (Rodd 2022).
2. We include the Tubbs Fire with the Camp, Woolsey, Nuns, Dixie, Thomas, and Butte Fires in this calculation. While the Tubbs Fire was found to have been ignited by a non-utility-owned power line, the utility wildfire mitigation measures discussed in this paper would have mitigated the risk of this ignition as well.
3. Notable examples include the Santiam Canyon and Holiday Farm Fires in Oregon in 2020, the Marshall Fire in Colorado in 2022, and the Lahaina Fire in Hawaii in 2023.
4. This is analogous to the manner in which the government compensates the owners of property seized under eminent domain. The reasoning used by California courts is that, because utilities function as government-granted monopolies, they should be held accountable under the same framework as the government when they effectively seize property from private owners by damaging or destroying it.
5. For example, PSPS events create safety risks for medical baseline customers who rely on electric medical devices in their home for life safety. Prior identification and communication with these customers and mitigation of these risks is essential for an acceptable PSPS process.
6. The recently released Wildland Fire Mitigation and Management Commission Report also makes useful suggestions on issues related to electric utilities that are consistent with the Playbook presented here. See the report “On Fire” from the Wildfire Fire Mitigation and Management Commission (2023, Rec. 7, p. 51).
7. We intend this 1-in-100 year risk to reflect current risk of wildfire losses as estimated by best available methods that take account of climate change, population growth, assets exposed to wildfire hazard, risk mitigation, and other relevant factors.
8. For a discussion of the homelessness issue in Chico, California, following structure losses due to the Camp Fire, see Anguiano (2022). For a discussion of the housing impacts following catastrophic wine country wildfires in 2017, see Raphaelson (2017).
9. Capacity factors in the U.S. increased from the mid-50s to the mid-90s between 1975 and 2010, largely due to improved operational practices that emerged from the INPO process. See, Rees 1996; Garside 2024.

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In the United States, utility-ignited wildfires threaten the affordability of electricity rates, the implementation of state and federal clean energy policies, and the housing market in several Western states. To date, unless electric utilities have themselves caused a significant wildfire that led to substantial losses, most have not visibly taken even basic steps to mitigate the risk that their system might cause a fire. At the same time, because of market perceptions of undifferentiated sector risk, utilities are facing rising financial costs for infrastructure investments that the United States needs them to make. In this proposal, we describe the core approach to utility wildfire mitigation developed by California utilities in conjunction with their economic and safety regulators and explain how parts of this mitigation framework might be applied across the West via a voluntary multistate and federal program, building on California’s Utility Wildfire Mitigation Playbook. We then propose that participation in this safety program could be dramatically increased by creation of a federal fund, to be called the Utility Wildfire Fund, access to which is conditioned on compliance with minimum safety standards set forth in the Playbook. The federal Utility Wildfire Fund could serve as a risk-pooling mechanism to better manage costs associated with fires that could occur even after utilities take necessary actions to reduce risk. Creation of such a fund would stabilize and lower financial risks for Western electric utilities, thereby lowering their financing costs and so facilitating needed clean energy and transportation electrification investments. By both substantially lowering risks and providing a form of reinsurance for utilities, this fund would also act to stabilize homeowners’ insurance markets and the broader housing market in parts of the West where these markets are threatened by the large and growing losses associated with utility-ignited wildfire.

The Federal Utility Wildfire Mitigation Playbook



Note: Step 5 of this playbook is not required for utilities to gain access to federal Utility Wildfire Fund, but rather, is left to the discretion of a given utility and its state regulator.



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