

CLIMATE HOMICIDE: PROSECUTING BIG OIL FOR CLIMATE DEATHS

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Prosecutors regularly bring homicide charges against individuals and corporations whose reckless or negligent acts or omissions cause unintentional deaths. Fossil fuel companies learned decades ago that what they produced, marketed, and sold would generate “globally catastrophic” climate change. Rather than alert the public and curtail their operations, they worked to deceive the public about these harms and prevent regulation of their lethal conduct. They funded efforts to call sound science into doubt and confuse their shareholders, consumers, and regulators. They poured money into campaigns to elect or install judges, legislators, and executive officials hostile to any litigation, regulation, or competition that might limit their profits. Today, the climate change that they forecast has already killed thousands of people in the United States, and it is expected to become increasingly lethal for the foreseeable future. Given the extreme lethality of fossil fuel companies’ conduct and their longstanding awareness of the catastrophic consequences, should they be charged with homicide? Could they be convicted? In answering these questions, this Article makes several contributions to our understanding of criminal law and the role it could play in combating crimes committed at a massive scale. It describes the doctrinal and social predicates of homicide prosecutions where multiple corporate actors have engaged in conduct that endangers much or all of the public. The Article finds that in jurisdictions across the United States, fossil fuel companies could be prosecuted for every type of homicide short of first degree murder, a charge it does not evaluate. It also concludes that prosecutions could offer highly effective remedies and that prosecutors should be motivated to seek them.

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INTRODUCTION

For decades, fossil fuel companies (“FFCs”) have known that their product causes “globally catastrophic” climate change.¹ Rather than warn the public or alter their business models, they waged a multi-decade disinformation campaign to sow doubt and delay regulatory responses.² Today, as experts continue developing and delivering ever more detailed and precise warnings of climate catastrophe, and vast numbers of people are killed at an accelerating rate by wildfires, floods, droughts, heatwaves, and other climate-related calamities,³ FFCs continue to expand the production, marketing, and sale of the products they have long understood to cause mass death.⁴

Activists and journalists have called executives of major oil companies “mass murderers,”⁵ lamenting that “millions of human beings will die so that they can have private planes and huge mansions,”⁶ and a growing chorus of communities devastated by FFCs’ lethal conduct have begun to demand accountability.⁷ But

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1. The phrase “globally catastrophic” is drawn from FFC internal communications. Memorandum from John Nelson to the American Petroleum Institute AQ-9 Task Force (Feb. 1980) (on file with ClimateFiles). For a more detailed discussion of what FFCs knew and when, see *infra* Part II.C.
 2. See *infra* Part II.D.
 3. See *infra* Part II.A.
 4. António Guterres, Secretary-General, United Nations, *Secretary-General’s Remarks at the World Economic Forum* (Jan. 18, 2023), <https://perma.cc/L6YS-XZZA>. (“[F]ossil fuel producers and their enablers are still racing to expand production, knowing full well that this business model is inconsistent with human survival.”).
 5. Kate Aronoff, *It’s Time to Try Fossil-Fuel Executives for Crimes Against Humanity*, JACOBIN (Feb. 5, 2019), <https://perma.cc/X36V-4WQQ>; Natasha Lennard, *Ecocide Should Be Recognized as a Crime Against Humanity, but We Can’t Wait for The Hague to Judge*, THE INTERCEPT, <https://perma.cc/XW8L-H2KQ>; Mark Osborne, *9 arrested for “die-in” protest at Rockefeller Center ice skating rink*, ABC NEWS, <https://perma.cc/8B9M-FF5M>; Daniel Politi, *Police Arrest 70 Climate Change Protesters Outside New York Times Building*, SLATE (Jun. 23, 2019), <https://perma.cc/V62S-2QBA>.
 6. Juan Cole, *Are ExxonMobil Execs the Most Evil People in the 200K-Year History of Humanity?*, COMMON DREAMS (May 19, 2019), <https://perma.cc/96SJ-YFNN>.
 7. See, e.g., *Cnty. of Multnomah v. Exxon Mobil Corp.*, No. 3:23-cv-01213 (D. Or. Aug. 18, 2023); *Mun. of Bayamon et al. v. Exxon Mobil Corp.*, No. 3:22-cv-01550, 2022 WL 17325711 (D.P.R. Nov. 22, 2022); *Platkin v. Exxon Mobil Corp.*, No. 22-cv-06733, 2023 WL 4086353 (D.N.J. Nov. 22, 2022); *Anne Arundel v. BP P.L.C.*, No. 22-2082 (4th Cir. Oct. 14, 2021); *City & Cnty. of Honolulu v. Sunoco*, No. SCAP-22-0000429 (Haw. Aug. 17, 2023); *Cnty of Maui v. Sunoco LP*, No. 2CCV-20-0000283 (Haw. Ct. App. Oct. 12, 2020); *City of Hoboken v. Exxon Mobil Corp.*, No. HUD-L-3179-20 (N.J. Super. C. Law Div. Sept. 2, 2020); *City of Charleston v. Brabham Oil Co.*, No. 23-01802 (4th Cir. Aug 3, 2023); *Rhode Island v. Shell Oil Products Co.*, No. PC-2018-4716 (R.I. Super. Ct. July 2, 2018); *Mayor & City Council of Baltimore v. BP P.L.C.*, No. 24-C-18-004219 (Md. Cir. Ct. July 20, 2018); *Board of County Commissioners of Boulder County v. Suncor Energy (U.S.A.), Inc.*, No. 2018CV30349 (Colo. Dist. Ct. Apr. 17, 2018). [hereinafter “Municipal and State Cases”].

as of this writing, no prosecutor in any jurisdiction has charged FFCs with any form of homicide over climate-related deaths.⁸ They should.

The case for homicide prosecutions is increasingly compelling. A steady growth in the information about what FFCs knew and what they did with that knowledge is revealing a story of antisocial conduct generating lethal harm so extensive it may soon become unparalleled in human history.⁹ FFCs have long understood the “globally catastrophic” risks that the production, marketing, and sale of their product generates.¹⁰ But when they learned of the grave dangers posed by their business model, they did not notify the public, regulators, or legislators, much less work to find solutions or change their business model. Instead, they waged extensive disinformation and political influence campaigns to obscure the risks, confuse others, and block legal or regulatory restriction of their increasingly lethal conduct.¹¹ Moreover, while they put their wealth to work reducing regulatory and legal risks to their profit margins, they privately used the data they publicly disputed to reduce their own exposure to climate change-related industrial risks to further maximize their future profits.¹² FFCs were technically sophisticated enough to know that they could hide the harms

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8. Many others have suggested criminal prosecutions more broadly. Notably, Professor Rena Steinzor has suggested several other forms of criminal prosecution for harming the environment. See RENA STEINZOR, *WHY NOT JAIL? INDUSTRIAL CATASTROPHES, CORPORATE MALFEASANCE, AND GOVERNMENT INACTION* 6 (2015); See also Donna Minha, *The Possibility of Prosecuting Corporations for Climate Crimes Before the International Criminal Court: All Roads Lead to the Rome Statute?*, 41 MICH. J. INT’L L. 491, 493–94 (2020). We view this as part of what Eric Biber calls “Law in the Anthropocene Epoch.” Eric Biber, *Law in the Anthropocene Epoch*, 106 GEO. L. J. 1 (2017).
 9. See generally *infra* Part II.B.
 10. *Supra* note 1 and accompanying text. See generally *infra* Part II.C.
 11. See generally Geoffrey Supran & Naomi Oreskes., *Assessing ExxonMobil’s Global Warming Projections*, Sci., Jan. 13, 2023 (describing the accuracy of internal models over decades and contradictory public statements); Benjamin Andrew Franta, *Big Carbon’s Strategic Response to Global Warming, 1950–2020* (Aug. 2022) (unpublished Ph.D. dissertation, Stanford University) (on file with Stanford Digital Repository), (detailing the state of FFC knowledge of climate change and the concurrent disinformation campaigns they waged); Sandra Lavielle, *Top Oil Firms Spending Millions Lobbying to Block Climate Change Policies*, THE GUARDIAN (Mar. 21, 2019), <https://perma.cc/4FKM-CC9V> (“The successful lobbying and direct opposition to policy measures to tackle global warming have hindered governments globally in their efforts to implement policies after the Paris agreement to meet climate targets and keep warming below 1.5C.”); Jillian Ambrose, *US Oil Giants Top List of Lobby Offenders Holding Back Climate Action*, THE GUARDIAN (Nov. 3, 2021), <https://perma.cc/VH9B-NZQ9> (“ExxonMobil and Chevron are the world’s most obstructive organisations when it comes to governments setting climate policies”); See also *infra* Part II.
 12. See Amy Lieberman & Susanne Rust, *Big Oil Braced for Global Warming While It Fought Regulations*, L.A. TIMES (Dec. 31, 2015), <https://perma.cc/L5WG-JNLZ> (“As many of the world’s major oil companies—including Exxon, Mobil and Shell—joined a multimillion-dollar industry effort to stave off new regulations to address climate change, they were quietly safeguarding billion-dollar infrastructure projects from rising sea levels, warming temperatures and increasing storm severity.”); see also *infra* Part II.C.

they were generating from lay observers for decades, allowing them to earn trillions of dollars while researchers, activists, and regulators struggled to overcome the sophisticated disinformation and political-influence campaigns these profits supported.¹³

FFCs were right to predict devastating harm from burning fossil fuels. Climate scientists are a conservative, cautious bunch, who have scarcely explored relatively extreme climate scenarios, including those we are squarely headed toward as opposed to the ones we aspire to reach.¹⁴ But the extant research is devastating. A leading study estimates over 4 million annual deaths by 2100 under an RCP 8.5 scenario from extreme temperatures alone¹⁵—that is, not including other factors that are expected to be major killers, such as disease, famine and malnutrition, increased human conflict, and other forms of extreme weather.¹⁶ We are currently on a pathway to 2.7°C of warming, but possibly much more, as that number is the median of a range of modeled outcomes.¹⁷ In addition, exceeding 2°C, or perhaps just 1.5°C,¹⁸ may make us significantly more likely to trigger tipping points that render humanity unable to limit

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13. See, e.g., Matthew Taylor & Jillian Ambrose, *Revealed: Big Oil's Profits Since 1990 Total Nearly \$2tn*, *The GUARDIAN* (Feb. 12, 2020), <https://perma.cc/UE5K-SMZS>.
 14. See Luke Kemp et al., *Climate Endgame: Exploring Catastrophic Climate Change Scenarios*, *PROCEEDINGS NAT'L ACAD. SCI.*, Aug. 1, 2022, at 6 (“There are many potential contributors to climate-induced morbidity and mortality, but the ‘four horsemen’ of the climate change end game are likely to be famine and undernutrition, extreme weather events, conflict, and vector-borne diseases.”).
 15. Katrin Burkart et al., *Projecting Global Mortality Due to Non-Optimal Temperature from 2020 to 2100: a Global Burden of Disease Forecasting Study* (Nov. 18, 2020) (on file with Social Science Research Network) (this is a preprint published on SSRN in coordination with *The Lancet*). Another study provides a central estimate of a 4.2% increase in global mortality from temperature change alone by 2100 under RCP 8.5 assumptions. See, e.g., R. Daniel Bressler et al., *Estimates of Country Level Temperature-Related Mortality Damage Functions*, 11 *SCI. REP.* 20282 (2021). There are also more conservative estimates for the United States. See Whanhee Lee et al., *Projections of Excess Mortality Related to Diurnal Temperature Range Under Climate Change Scenarios: A Multi-Country Modeling Study*, 4 *LANCET PLANET HEALTH* 512, 518 Figure 2 (2020) (reflecting a projection that excess mortality from higher daytime temperatures in the United States will increase from 3.0% in the period 2010–2019 to roughly 5.5% by 2100 under RCP 8.5 assumptions). See also Drew Shindell et al., *The Effects of Heat Exposure on Human Mortality Throughout the United States*, *GEOHEALTH*, Mar. 26, 2020, at 1 (estimating 12,000 premature deaths per year in the United States currently caused by climate change related heat, rising by 97,000 heat-related deaths every year by 2100 under RCP 8.5 assumptions and 36,000 per year under an RCP 4.5 scenario).
 16. See Kemp et al., *supra* note 14.
 17. *Temperatures*, *CLIMATE ACTION TRACKER*, (Nov. 11, 2022), <https://perma.cc/T8MX-ZHYE>.
 18. David I. Armstrong McKay et al., *Exceeding 1.5°C Global Warming Could Trigger Multiple Climate Tipping Points*, *SCI.*, Sept. 9, 2022, <https://perma.cc/MV8G-F26E>.

warming below 4°C or 5°C,¹⁹ temperatures at which we cannot be certain most humans will survive.²⁰

A full account of FFCs' lethality would also include deaths from air pollution, which at present is more deadly than climate change. The vast majority of air pollution is caused by burning fossil fuels.²¹ It is the leading cause of preventable death globally, causing one in five deaths, or more than 8 million annually, including 350,000 in the United States.²² Global warming also exacerbates these deaths because higher temperatures fuel the chemical reactions that create smog, or ground-level-ozone.²³ More heat means more smog,²⁴ and more smog means more death.²⁵ Although liability for air pollution deaths is not the focus of this Article, there is evidence that FFCs have been aware that burning fossil fuels causes smog since at least the 1940s and that, by the 1950s, they were disputing the relevant science and sowing doubt about it.²⁶

The summary above describes the core elements of an ongoing mass homicide: conduct undertaken with a culpable mental state that substantially contributes to or accelerates death.²⁷ Much of the conduct—the production, marketing, and sale of their harmful product—is undisputed. There is a strong case to be made that FFCs knew that their conduct would have lethal consequences. But even if their conduct was merely reckless or negligent with respect to the deaths they are causing, there are homicide charges for causing death with either of

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19. Will Steffen et al., *Trajectories of the Earth System in the Anthropocene*, 115 PROCEEDINGS NAT'L ACAD. SCI. 8252, 8255 (2018); *Planet at Risk of Heading Toward 'Hothouse Earth,' State*, STOCKHOLM UNIV. (Aug. 6, 2018), <https://perma.cc//GW2J-9JBB>; see Kemp et al., *supra* note 14.
 20. Yangyang Xu & Veerabhadran Ramanathan, *Well Below 2°C: Mitigation Strategies for Avoiding Dangerous to Catastrophic Climate Changes*, 114 PROCEEDINGS NAT'L ACAD. SCI. 10315, 10319 (2017); POTSDAM INST. FOR CLIMATE IMPACT RSCH. & CLIMATE ANALYTICS, *TURN DOWN THE HEAT: WHY A 4°C WORLD MUST BE AVOIDED xviii* (2012) (“[T]here is also no certainty that adaptation to a 4°C world is possible.”).
 21. Frederica Perera, *Pollution from Fossil-Fuel Combustion Is the Leading Environmental Threat to Global Pediatric Health and Equity: Solutions Exist*, INT'L J. ENV'T RSCH. PUB. HEALTH, Jan. 2018, at 3.
 22. *Fossil Fuel Air Pollution Responsible for 1 in 5 Deaths Worldwide*, HARVARD T.H. CHAN SCHOOL OF PUBLIC HEALTH (Feb. 9, 2021), <https://perma.cc/PN86-3CU7>; see Karn Vohra et al., *Global Mortality from Outdoor Fine Particle Pollution Generated by Fossil Fuel Combustion: Results from Geos-Chem*, 195 ENV'T RSCH. 110754, 1 (2021).
 23. See *What is Ozone?*, EPA (July 25, 2022), <https://perma.cc/DY9R-2PE4>; *Energy and the Environment Explained: Where Greenhouse Gases Come From*, U.S. ENERGY INFO. ADMIN. (June 24, 2022), <https://perma.cc/H97N-PWP3>.
 24. See, e.g., Bryan Walsh, *Why Bad Heat = Bad Air*, TIME (July 22, 2011), <https://perma.cc/3HWL-Y59L>.
 25. See Karn Vohra et al., *supra* note 22 (estimating that more than 8 million people died between 2012 and 2018 from fossil fuel pollution, including hundreds of excess deaths of children under 4 years old in North America).
 26. See Franta, *supra* note 11, at 21–25.
 27. See *infra* Part IV.

those culpable mental states. Alternatively, under misdemeanor manslaughter or felony murder laws, if prosecutors can prove that FFCs engaged in any related criminal conduct involving fraud, racketeering, anti-competitive practices, or safety violations, FFCs could be liable for homicide independent of their mental state.²⁸ As additional evidence of FFCs' knowledge of the lethal risks they were generating surfaces through leaks and court-mandated discovery, obstacles to a successful prosecution are falling away.

At the same time, with every new wave of climate-related deaths, the justification for prosecution grows. Although some of the harmful externalities that FFCs generate may be suitable for tort or regulatory suits, the lethality of FFCs' conduct, their awareness of the risks they are generating, and their efforts to obscure those risks make criminal prosecution for homicide particularly appropriate.²⁹ Perhaps most importantly, if FFCs continue to fight against all major efforts to reduce the harms they are generating, and if they continue to obstruct or delay state and federal regulation and civil suits designed to reduce the lethal impact of their conduct,³⁰ then homicide prosecutions may prove necessary to prevent the escalating threat that their lethal conduct poses to millions of potential victims in the United States.³¹

Prosecutors regularly bring charges against individuals for far less serious crimes. But many are reluctant to prosecute corporations, perhaps because they see no obvious benefit.³² A corporation, after all, cannot be thrown in jail, and the dismantling of a massive corporation could have broad negative economic consequences. These prosecutors are likely unaware of remedies that can effectively force harmful corporate actors to adopt pro-social practices while preserving the economic value of the corporation itself. This Article reviews these remedies, highlighting one particularly appropriate sanction drawn from the recent criminal prosecution of Purdue Pharma: restructuring into public benefit corporations.³³ Rewriting the corporate form of corporations is, this Article

28. This evidence should be convincing enough to overcome the presumption that externalities of valuable economic activity should be managed through civil remedies. *See infra* Part V.

29. *See infra* Part II. E.

30. This is in part because, as Douglas Kysar lamented over a decade ago, "diffuse and disparate in origin, lagged and latticed in effect, anthropogenic greenhouse gas emissions represent the paradigmatic anti-tort, a collective action problem so pervasive and so complicated as to render at once both all of us and none of us responsible." Douglas A. Kysar, *What Climate Change Can Do About Tort Law*, 41 ENV'T. L. 1, 4 (2011).

31. Karn Vohra et al., *supra* note 22, at 5 (estimating that in the United States 13.1% of deaths over the age of 14, roughly 355,000 annually, are attributable to fossil fuels); *see also infra* notes 53, 56, Part V (describing the failure to prosecute big tobacco companies for similar conduct).

32. *See infra* Part V.B. (discussing the unfortunate effect this line of thinking had in the context of tobacco litigation).

33. U.S. Dept. of Just., *Justice Department Announces Global Resolution of Criminal and Civil Investigations with Opioid Manufacturer Purdue Pharma and Civil Settlement with Members of the Sackler Family* (Oct. 21, 2020), <https://perma.cc/565M-FGBJ>.

argues, particularly attractive when society is dependent on corporations that are engaging in what, doctrinally speaking, amounts to mass homicide.

We should note up front that this Article does not recommend the abrupt cessation of fuel production or the imprisonment of executives as a core objective. Rather, as we detail below, we advocate leveraging the unique power of criminal prosecutions to hold FFCs accountable in ways that are both meaningful and practically beneficial.

The argument proceeds as follows. Part I of this Article lays out a general justification for prosecution. Part II outlines factual predicates that could form the basis of homicide liability for FFCs. Part III describes five possible homicide charges and how the facts could support each: negligent homicide, manslaughter, misdemeanor manslaughter, depraved and malignant heart murder, and felony murder. Part IV explores possible affirmative defenses. Part V discusses ways that the threat of criminal liability could support remedies, even in the absence of criminal prosecution resulting in conviction.

I. FFCs SHOULD FACE PROSECUTION FOR HOMICIDE

Before discussing the facts and doctrine relevant to homicide charges in Parts II–IV, this Article starts with a more general case for prosecuting FFCs for homicide.

A. FFCs' Conduct Is Exceptionally Egregious and Harmful

We begin with a basic point about homicide doctrine: it is meant to protect life, to punish those who kill, and to give expression to a core value that the lives of all people are valued by the law and by society.³⁴ In this case, the real-world stakes are high: if FFCs continue to produce, market, and sell all available fossil fuels, they will contribute to the deaths of an innumerable large number of people and render large regions of the planet unfit for human life.³⁵ The stakes are also high for rule of law in the United States: if the law does not call FFCs to account, does not sufficiently value or protect the lives being sacrificed to bolster FFC profits, and allows the “globally catastrophic” consequences that FFCs

34. This is why, as Lisa Heinzerling has eloquently noted, killing is only justified as a necessity in those rare instances “when an occasion suddenly arises in which the deaths of a few are required to prevent the deaths of many and not when killing becomes a part of long-term social or economic planning.” Lisa Heinzerling, *Knowing Killing and Environmental Law*, 14 N.Y.U. ENV'T. L.J. 521, 529 (2006).

35. See generally ELIZABETH KOLBERT, *THE SIXTH EXTINCTION: AN UNNATURAL HISTORY* (2014); DAVID WALLACE-WELLS, *THE UNINHABITABLE EARTH: LIFE AFTER WARMING* (2019).

themselves foresee, it could threaten the increasingly equitable social ordering humanity has slowly, over centuries, worked to foster.³⁶

In its most abbreviated form, the legal definition of criminal homicide is causing death by an act or omission with a culpable mental state.³⁷ Publicly available information shows that FFCs conducted and relied on research into the consequences of using their product, and they found not some minor risk of harm at the margin, but risks of harm so great that no reasonable person would disregard them.³⁸ Their own inquiries, combined with other research they consumed, showed among other things that the production and use of fossil fuels would render large swaths of the planet uninhabitable, pushing many cities under water, and generate such extensive drought and flooding in food-producing regions of the globe that mass famine would follow.³⁹

FFCs were not naive or uninformed actors. They were sophisticated enough to know that these effects would be delayed such that the public would not perceive them for decades—in fact, delayed until too late to prevent grave harm. While some FFCs considered pivoting to less destructive forms of energy production, most doubled down on their lethal business model, funding disinformation campaigns designed to prevent public or regulatory responses that would diminish their profits. They were extraordinarily successful, reaping trillions of dollars in revenue over decades.⁴⁰ No reasonable and informed person doubts that FFCs were aware of the harms they were generating—in other words, that they caused or contributed to deaths, with a culpable mental state. And that, as any prosecutor can attest, is the core of homicide.

B. Homicide Prosecutions Are Justified

Consider now the standard justifications for punishment and how climate-related homicides compare with other unintentional homicides in relation to each. From a utilitarian perspective (and for reasons detailed in Part V below), criminal prosecution may be an effective way for states to prevent further harm

36. See generally TOM BINGHAM, *THE RULE OF LAW* (2011) (describing the centrality of the principle that “no one is above the law” to human welfare and modern democratic life); see also JOHN RAWLS, *THE LAW OF PEOPLES* (2001) (describing the importance of egalitarian enforcement of the law to a just society); Jeremy Waldron, *The Rule of Law*, *STAN. ENCYC. OF PHIL.* (June 22, 2016), <https://perma.cc/Y7KP-YBJA> (describing a core feature of rule of law as being that it “applies, universalizably, to everyone.”).

37. See *infra* Part IV.B.

38. See *infra* Part II.C. It is worth emphasizing that FFCs themselves have characterized the consequences of future climate change driven by their conduct as “globally catastrophic.” Nelson, *supra* note 1.

39. See Franta, *supra* note 11, at 105 (discussing the effects known to FFC researchers and management).

40. Damian Carrington, *Revealed: Oil Sector’s ‘Staggering’ \$3bn-A-Day Profits for Last 50 Years*, *THE GUARDIAN* (July 21, 2022), <https://perma.cc/M5M3-KYWS>.

and to require remediation.⁴¹ If criminal prosecution can reduce by even a small fraction the future deaths caused by the prior and ongoing conduct of FFCs, it will have done a significant service. From a utilitarian perspective, the failure to use the power of the criminal law to compel those who threaten humanity's future to desist and repair what damage they can would count as a failure of the highest order.

From the perspective of fairness and just deserts,⁴² sophisticated, wealthy actors who are willing to let millions die so they might accumulate more wealth require prosecution as a matter of justice.⁴³ And although legal scholars may disagree over punishment of the ignorant or the uneducated, they have no pity for learned and powerful actors who use their advantage to harm others for their own benefit. Deception and sophistry are, for nearly all retributivists, the opposite of exculpating; they reveal the mental acuity to understand and manipulate others to achieve some private benefit at another's expense.⁴⁴

Similarly, the expressive justification of punishment—the view that punishment gives expression to a community's fundamental values—falls squarely in favor of prosecution.⁴⁵ For if we are willing to prosecute the poor, the hapless, and the abused when their conduct causes death, what does it say—what message does it send—if we refuse to prosecute those who have the advantages of money, notice, sophistication, and influence?⁴⁶

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41. See Jeremy Bentham, *An Introduction to the Principles of Morals and Legislation*, in *THE UTILITARIANS* 170 (Dolphin Books 1961) (describing punishment as deterring potential offenders by raising the costs associated with criminal acts); see generally Gary S. Becker, *Crime and Punishment: An Economic Approach*, 76 J. POL. ECON. 169 (1968) (formalizing the argument for deterrence in the language of neoclassical economics).
 42. See IMMANUEL KANT, *THE PHILOSOPHY OF LAW* 194–98 (W. Hastie trans., The Lawbook Exchange, Ltd. ed. 2002) (1887) (justice requires that punishment be “pronounced over all criminals proportionate to their internal wickedness”); ANDREW VON HIRSCH, *DOING JUSTICE: THE CHOICE OF PUNISHMENTS* 69 (1976) (proportionate punishment is a “requirement of justice”); see generally Herbert Morris, *Persons and Punishment*, 52 *MONIST* 475 (1968) (punishment should redress the unfair advantage that lawbreakers gain over those who respect that law).
 43. See Matthew Talbert, *Moral Responsibility*, *STAN. ENCYC. OF PHIL.* (Oct. 16, 2019), <https://perma.cc/5HVJ-ZTCZ> (describing an actor's moral responsibility for any action as depending on the actor's “powers” and “capacities”); IMMANUEL KANT, *LECTURES ON ETHICS* 27:553 (Cambridge University Press 2001) (describing punishment as “an immediately necessary consequence of breaking the law.”).
 44. That is, they treat others as means rather than ends. See generally THOMAS L. CARSON, *LYING AND DECEPTION: THEORY AND PRACTICE* (2010); LEO KATZ, *ILL-GOTTEN GAINS: EVASION, BLACKMAIL, FRAUD, AND KINDRED PUZZLES OF THE LAW* (1996).
 45. See Dan M. Kahan, *What Do Alternative Sanctions Mean?*, 63 *U. CHI. L. REV.* 591, 598 (1996) (“Under the expressive view, the signification of punishment is moral condemnation.”); cf. RICHARD H. McADAMS, *THE EXPRESSIVE POWERS OF LAW: THEORIES AND LIMITS*, 13 (2015) (describing the expressive function of law as helping to explain behavior).
 46. The answer that it would say different things to different people is undoubtedly true. A lack of enforcement that tells the powerful they can get away with killing has a broader expressive

These concerns go to the heart of challenges currently confronting the criminal legal system in every jurisdiction today. While the politically powerless spend years in prison for conduct that arguably harms no one,⁴⁷ powerful corporations engaging in lethal conduct at a massive scale are avoiding prosecution—and even the threat of prosecution—for the deaths they cause. Whether FFCs are insulated by their wealth and power or a more subtle confluence of those factors with their ability to portray their conduct as productive, beneficial, or even necessary, the disparity is striking. Justice Black famously said, “[t]here can be no equal justice where the kind of trial a man gets depends on the amount of money he has.”⁴⁸ The “kind” of homicide trial FFCs desire for the deaths they are causing is no trial at all—and that is exactly what they are getting. Under any major theory of punishment, that is unjust.

C. FFCs’ Culpability Far Exceeds That in Ordinary Homicide Cases

Homicide prosecutions for far less culpable and lethal conduct are regularly undertaken across the country. People are regularly indicted and convicted over momentary negligence that kills a single person.⁴⁹ Consider a few examples:

- A nurse mistakenly injects a patient with a paralytic instead of a sedative; the nurse is convicted of negligent homicide for the death of the patient.⁵⁰
- A woman passes cars that stopped in front of her, hitting and killing a child running into the road; the woman is convicted of vehicular manslaughter.⁵¹
- A man brings his five-year-old son to a park to play, then crosses the street to speak with a friend; his son follows behind

message that may be equally if not more important than the direct signaling sent to those involved in killings.

47. Here, we are thinking of drug possession cases. *See generally* MICHELLE ALEXANDER, *THE NEW JIM CROW: MASS INCARCERATION IN THE AGE OF COLORBLINDNESS* (2015) (describing many harms of the war on drugs). Some have also argued that drug use can be helpful. *See generally* CARL L. HART, *DRUG USE FOR GROWN UPS: CHASING LIBERTY IN THE LAND OF FEAR* (2021) (describing benefits of responsible drug use).

48. *Griffin v. Illinois*, 351 U.S. 12, 19 (1956).

49. *See infra* Part IV. Some of the most common unintentional homicides involve traffic accidents and momentary negligent or reckless behavior. *See generally* John Clennan, *How to Deter Pedestrian Deaths: A Utilitarian Perspective on Careless Driving*, 36 *TOURO L. REV.* 435 (2020) (reviewing some recent cases and doctrine).

50. Mariah Timms, *Ex-Nurse RaDonna Vaught Found Guilty on Two Charges in Death of Patient*, *THE TENNESSEAN* (Mar. 25, 2022), <https://perma.cc/PS24-HVET>.

51. *Actress Gets Probation for Running Down Boy*, *L.A. TIMES* (Nov. 28, 2001), <https://perma.cc/7EBR-CJ4P>; *see also* Christopher Hoffman, *Enfield Teacher Accused of Negligent Homicide in Pedestrian’s Death in Newington*, *HARTFORD COURANT* (Aug. 4, 2016), <https://perma.cc/J9GH-ET7Z> (describing charges against Alyssa Santos for running a red light and hitting a man drunkenly staggering into the road).

him and is hit and killed by a passing car; the father is convicted of involuntary homicide for the death of his son.⁵²

Far less harmful and culpable behavior than that of FFCs has supported prosecutions for murder as well:

- A man attempts to shoplift razor blades, and one of the guards who apprehends and handcuffs him subsequently dies of a heart attack; the man is convicted of felony murder for the death of the security guard.⁵³
- After being pulled over for following another car too closely, a driver flees the scene in his car. Over 100 yards behind the fleeing driver, a pursuing police car collides with a stopped police car, killing one of the officers. The driver is convicted of felony murder for the death of the officer.⁵⁴
- A man and his cousin jointly possess and prepare cocaine, some of which the cousin consumes and dies. The man is convicted of felony murder for his cousin's death.⁵⁵

In none of these cases did the defendants' lethality reach the scale of FFCs'. In none did the defendants have a long history of consuming and then disregarding evidence about lethal risks associated with their conduct. And in none of these cases were the defendants engaged in campaigns of fraud or deception designed to hide both the lethality of their conduct and their knowledge of that lethality.

It will require considerable work to successfully prosecute FFCs because they possess real political power, sophistication, and considerable financial resources. Unlike most homicide defendants, FFCs will be represented by some of the most skilled and highly compensated attorneys available, and their counsel will make every argument they think effective in their defense.⁵⁶ They will deploy considerable resources to ensure that the prosecution will fail to indict,

52. Ty Tagami, *Mother: Father's Punishment Too Steep in Boy's Death*, THE ATLANTA J.-CONST. (Oct. 18, 2010), <https://perma.cc/467L-TEK7>.

53. Times Staff Writer, *Shoplifter Gets Five Years in Death of Target Guard*, TAMPA BAY TIMES (Jan. 14, 2013), <https://perma.cc/L2VE-HCME>.

54. Beth Schwartzapfel, *D'Angelo Burgess Fled From Police. Does That Make Him a Killer?*, THE MARSHALL PROJECT (May 30, 2019), <https://perma.cc/GP6K-XY9W>.

55. *Hickman v. Commonwealth*, 398 S.E.2d 698, 700 (Va. Ct. App. 1990).

56. Recent empirical research shows considerable compensation effects on defense attorney performance. See Michael A. Roach, *Indigent Defense Counsel, Attorney Quality, and Defendant Outcomes*, 15 AM. L. & ECON. REV. 577, 595 (2014) (noting that high quality defense attorneys are less likely to join assigned panels to defend indigent clients at a standard, low hourly rate because other, high-compensation work options are available); Amanda Agan et al., *Is Your Lawyer a Lemon? Incentives and Selection in the Public Provision of Criminal Defense* (Nat'l Bureau of Econ. Rsch., Working Paper No. 24579, 2018), <https://perma.cc/U3C4-3L68>; Andrew J. Lee, *Flat Fee Compensation, Incentives, and the Right to Effective*

face speedy dismissal, or fail to obtain a conviction. If recent history is any guide, they may attack their prosecutors politically and in the courts.⁵⁷ But these factors reflect the high status of the defendants, not their culpability, and failure to prosecute them for these reasons would be tantamount to an admission that the powerful are above the law.

This Article does not suggest that FFCs or their officers should be made to suffer in service of some vindictive or punitive purpose. Nor does it suggest there would be any utility in their suffering. Rather, in line with humane principles of justice, it acknowledges that true accountability requires a reckoning of the harm FFCs have inflicted and the acts they must undertake to restore the people and communities they have harmed to a less damaged state.⁵⁸ As argued at greater length below, there are few tools as powerful as criminal prosecution for bringing parties as powerful as FFCs to the table for a meaningful reckoning.

We turn now to the relevant facts and law.

II. FFCs' ACTS, OMISSIONS, AND AWARENESS

Over the past decade, a wealth of evidence has surfaced demonstrating the scope of FFCs' criminal conduct, the lethal harms that their conduct caused, and their awareness of the relationship between their conduct and those harms. We start with what every reasonable person familiar with the science of climate change now knows: FFCs have caused and are continuing to cause death at an increasingly massive scale.⁵⁹ We now have extensive information in the public record showing that but for the FFC's production, marketing, and sale of their product, and but for FFC's disinformation campaigns designed to contradict and distract from climate science, and but for FFC's multi-million dollar political influence campaigns designed to fend off reasonable regulation and alternative forms of energy, thousands of Americans lives would have been spared in past decades, and hundreds of thousands more would be spared over the next several.⁶⁰

We then turn to FFCs' awareness of the relationship between their conduct and the lethal harms they foresaw flowing from that conduct.⁶¹ Again, facts now in the public record show that FFCs generated internal research and engaged

Legal Counsel for Poor Criminal Defence (Dec. 23, 2021) (unpublished working paper), <https://perma.cc/PJ5D-3VLL>.

57. Arianna Skibell, *Oil Majors Target Judges as Climate Suits Multiply*, POLITICO (Aug. 14, 2023), <https://perma.cc/B7W6-AH5R>.

58. See generally HOWARD ZEHR, *THE LITTLE BOOK OF RESTORATIVE JUSTICE* (2002).

59. See *infra* Parts II.A & II.B.

60. *Id.*

61. See *infra* Part II.C.

with external research clearly demonstrating the risks of mass mortality associated with their business practices.⁶²

And finally, we examine the campaign that FFCs undertook to hide the relationship between their conduct and these increasingly massive lethal harms.⁶³ FFCs not only refused to alert the public or relevant government actors; they funded campaigns to sow doubt and confusion regarding this research and the extent of scientific consensus about the role of fossil fuels in altering the climate, the catastrophic effects of the carbon-forced climate change, and the ability of regulation, legislation, and alternative energy sources to mitigate these risks.⁶⁴

A. FFCs' Conduct Caused Death in the United States

FFCs' business practices caused and continue to cause thousands of deaths every year in the United States. Experts expect this lethality to grow significantly in coming years if their practices continue unabated.⁶⁵

A significant portion of FFC-driven mortality derives from the well-documented increases in extreme weather events driven by carbon emissions from fossil fuels. Although FFC-induced climate change is not the sole cause of individual hurricanes, wildfires, extreme heat waves, or other destructive weather events, it makes them more frequent, more intense, or more deadly.⁶⁶

62. *Id.*

63. *See infra* Part II.D.

64. *Id.*

65. This Article primarily discusses U.S. mortality because it addresses the question of criminal prosecution under U.S. domestic law. In many other parts of the world, the harms of climate change are far worse and the death toll vastly higher. *See e.g.*, David Ciple et al., *A Burden to Share? Addressing Unequal Climate Impacts in the Least Developed Countries*, INT'L INST. FOR ENV'T & DEV., Nov. 2013, at 1.

66. The science linking climate change with weather disasters, known as "attribution science," is improving rapidly. *See* NAT'L ACAD. OF SCIS., ENG'G, AND MED., *ATTRIBUTION OF EXTREME WEATHER EVENTS IN THE CONTEXT OF CLIMATE CHANGE* (2016); Quirin Schiermeier, *Droughts, Heatwaves and Floods: How to Tell When Climate Change Is to Blame*, NATURE (2018), <https://perma.cc/WFW9-B2F4>. This Article may be the first to link attribution science to the distinctive form of causation doctrine of modern criminal codes modeled on the Model Penal Code, but many others have discussed the legal significance of climate attribution more generally. *See, e.g.*, Michael Burger et al., *The Law and Science of Climate Change Attribution*, 45 COLUM. J. ENV'T. L. 57, 63 (2020); Sophie Marjanac & Lindene Patton, *Extreme Weather Event Attribution Science And Climate Change Litigation: An Essential Step in the Causal Chain?*, 36 J. ENERGY & NAT. RES. L. 265, 265–68 (2018); Rupert F Stuart-Smith et al., *Liability for Climate Change Impacts: the Role of Climate Attribution Science*, in *CORPORATE RESPONSIBILITY AND LIABILITY IN RELATION TO CLIMATE CHANGE* (Intersentia 2022). Since 2011, the Bulletin of the American Meteorological Society has published a series of reports, usually annual, on the attribution of extreme weather to climate change. *See Explaining Extreme Events from a Climate Perspective*, AM. METEOROLOGICAL SOC'Y, <https://perma.cc/2RDY-LELC>.

A spate of record-breaking, climate-fueled hurricanes provides a vivid example:⁶⁷ experts have drawn direct links between the heat-trapping emissions associated from burning fossil fuels and Hurricanes Harvey, Irma, Maria,⁶⁸ Michael,⁶⁹ Florence,⁷⁰ Dorian,⁷¹ Laura,⁷² Ida,⁷³ and Ian.⁷⁴ The deadliest of these hurricanes, Maria, killed thousands of people, nearly all in Puerto Rico.⁷⁵

As climate attribution science becomes more robust and precise, scientists are becoming increasingly confident in their estimates of the proportion of deaths caused by fossil fuel-driven climate change. For example, a recent study found that 35 percent of heat-related deaths in select U.S. cities from 1991 to 2018, or 1,110 deaths per year in those cities were due to carbon-driven climate change.⁷⁶ Another projects that annual premature deaths in the U.S. from heat exposure will rise from 12,000 at present to 109,000 by 2100 under a high emissions scenario and 48,000 under a more moderate scenario.⁷⁷ Most recently, in June 2021, “[h]undreds of people died across the Pacific Northwest and British Columbia” in an unprecedented heat wave that would have been

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67. *Stronger Hurricanes*, CLIMATE CENTRAL (Sept. 23, 2020), <https://perma.cc/2JMA-VPJS>; Chris Mooney & Andrew Freedman, *Hurricane Laura's Rapid Intensification Is a Sign of a Warming Climate, Scientists Say*, WASH. POST (Aug. 30, 2020), <https://perma.cc/YLA8-5WNE>.
68. Umair Irfan, *One of the Clearest Signs of Climate Change in Hurricanes Maria, Irma, and Harvey Was the Rain*, Vox (Sept. 29, 2017), <https://perma.cc/PJR9-XC6A>.
69. Jeff Berardelli, *Climate Change Provided High Octane Fuel for Hurricane Michael*, CBS NEWS (Oct. 13, 2018), <https://perma.cc/PS2F-A8H8>.
70. Laura Parker, *Hurricane Florence's Rains May Be 50% Worse Thanks to Climate Change*, NAT'L GEOGRAPHIC (Sept. 13, 2018), <https://perma.cc/4GFV-A7YC>.
71. John Schwartz, *How Has Climate Change Affected Hurricane Dorian?*, N.Y. TIMES (Sept. 3, 2019), <https://perma.cc/G7MM-CQHB>.
72. Mooney & Freedman, *supra* note 67.
73. Sarah Kaplan, *How Climate Change Helped Make Hurricane Ida One of Louisiana's Worst*, WASH. POST (Aug. 30, 2021), <https://perma.cc/NX6D-DKWG>.
74. Scott Dance & Kasha Patel, *How Climate Change Is Rapidly Fueling Super Hurricanes*, WASH. POST (Sept. 29, 2022), <https://perma.cc/UH6Y-4YX9>.
75. Nishant Kishore et al., *Mortality in Puerto Rico after Hurricane Maria*, 379 NEW ENG. J. MED. 162, 167 (July 12, 2018) (making a “conservative” estimate that Hurricane Maria caused 4,645 “excess deaths,” with further adjustments increasing that estimate to more than 5,000); *Complaint, Muns. of Puerto Rico v. Exxon Mobil Corp.*, No. 3:22-CV-01550 (D.P.R. Nov. 22, 2022).
76. *See, e.g.*, Seth Borenstein, *Study Blames Climate Change for 37% of Global Heat Deaths*, ASSOCIATED PRESS (May 31, 2021), <https://perma.cc/C2SL-PXZG> (discussing A. M. Vicedo-Cabrera et al., *The Burden of Heat-Related Mortality Attributable to Recent Human-Induced Climate Change*, 11 NATURE CLIMATE CHANGE 492 (2021)). Heat is already the leading weather-related cause of death in the U.S. *See* EPA, *Climate Change Indicators: Heat-Related Deaths* (July 21, 2023), <https://perma.cc/VL3M-VKJJ>.
77. *See* Shindell et al., *supra* note 15; *see also* G. Brooke Anderson et al., *Projected Trends in High-Mortality Heatwaves Under Different Scenarios of Climate, Population, and Adaptation in 82 US Communities*, 146 CLIMATE CHANGE 455, 462–66 (2018).

“virtually impossible”⁷⁸ without climate change. Indeed, regions all over the world, including in the United States, are increasingly hit by “impossible” or “virtually impossible” extreme weather events that could not have occurred in the absence of global warming.⁷⁹

Wildfires increasingly ravage the western U.S.⁸⁰ Global warming has “vastly increased” the likelihood of wildfires, as well as their intensity and range, and dramatically extended wildfire “seasons.”⁸¹ The geographic area burned by wildfires has increased dramatically in the last 50 years, and “nearly all” of the increase is “attributable to anthropogenic climate change.”⁸² In the past ten years, wildfires have killed 211 people in California,⁸³ including 100 in 2018 alone.⁸⁴ A 2023 wildfire killed at least 97 people in Maui.⁸⁵ Although evidence is not yet conclusive, scientists believe warmer temperatures may be increasing the frequency, range, and intensity of tornadoes as well.⁸⁶

Fossil fuel-driven climate change also exacerbates mortality in other ways beyond extreme weather events. In the United States, air pollution from fossil fuels causes more than 13 percent of deaths of people over age 13 and 10 percent of deaths of children under age five.⁸⁷ As discussed

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78. YCC Team, *2021 Pacific Northwest Heat Wave ‘Virtually Impossible’ without Global Warming, Scientists Find*, YALE CLIMATE CONNECTIONS (Nov. 2, 2021), <https://perma.cc/LR8P-2R9C>.
79. See, e.g., Rachel Ramirez, *Without Climate Change, These Extreme Weather Events Would Not Have Happened*, CNN (June 16, 2023), <https://perma.cc/D3H5-NMVF>.
80. Blacki Migliozi et al., *Record Wildfires on the West Coast Are Capping a Disastrous Decade*, N.Y. TIMES (Sept. 24, 2020), <https://perma.cc/E5U8-HJC8> (“In the last 20 years, on average, the number of square miles burned annually across California, Oregon and Washington has increased sixfold compared with the average between 1950 and 2000.”).
81. Alejandra Borunda, *The Science Connecting Wildfires to Climate Change*, NAT’L. GEOGRAPHIC (Sept. 17, 2020), <https://perma.cc/5UAJ-N7KK>; Jeff Masters, *Reviewing the Horrid Global 2020 Wildfire Season*, YALE CLIMATE CONNECTIONS (Jan. 4, 2021), <https://perma.cc/47JA-M2AE>; Glen MacDonald et al., *Drivers of California’s Changing Wildfires: a State-of-the-Knowledge Synthesis*, 32 INT’L J. OF WILDLAND FIRE 1039, 1040 (2023); Anne C. Mulkern, *Climate Change Has Doubled Riskiest Fire Days in California*, SCI. AM. (Apr. 3, 2020), <https://perma.cc/TT48-XH9S> (“Climate change has doubled the number of extreme-risk days for California wildfires.”).
82. Marco Turco et al., *Anthropogenic Climate Change Impacts Exacerbate Summer Forest Fires in California*, 120 PROCEEDINGS NAT’L ACAD. SCI., June 12, 2023, at 1.
83. *Current Emergency Incidents*, CAL FIRE, <https://perma.cc/B3L6-D4Y5>.
84. *2018 Incident Archive*, CAL FIRE, <https://perma.cc/3UNZ-JNUE>.
85. Adeel Hassan, *What We Know About the Maui Wildfires*, N.Y. TIMES (Sept. 20, 2023), <https://perma.cc/Y2N7-28XS>.
86. Rachel Treisman, *The Exact Link Between Tornadoes and Climate Change Is Hard to Draw. Here’s Why*, NPR (Mar. 27, 2023), <https://perma.cc/3N6E-W6S7>.
87. See Karn Vohra et al., *supra* note 22, Tables 1, 2; see also Tatyana Deryugina et al., *The Mortality and Medical Costs of Air Pollution: Evidence from Changes in Wind Direction*, 109 AM. ECON. REV. 4178, 4192 (2019) (describing mortality effects of pollution); Michael L. Anderson, *As the Wind Blows: The Effects of Long-Term Exposure to Air Pollution on Mortality*, 18 J. EUR. ECON. ASSOC. 1886, 1886 (2019) (finding that doubling “time spent downwind of a highway increases mortality among individuals 75 or older by 3.8%-6.5%”). More recently,

above,⁸⁸ warmer temperatures catalyze the creation of additional smog, thereby increasing these deaths. Climate change also contributes to major refugee crises and armed conflicts impacting the United States.⁸⁹ It is a major cause of food insecurity and other harms that are driving many Central Americans to migrate to the United States.⁹⁰ Recent research suggests that the tropics—a 3,000-mile-wide band around the Earth’s equator, contains half the earth’s surface, and is home to 3 billion people—may become uninhabitable after warming greater than 1.5°C.⁹¹ Among those who will be affected are millions of Americans in Hawaii, Puerto Rico, and other U.S. territories. And, according to recent projections Southern Florida and Texas may soon produce millions of climate refugees seeking higher latitudes and higher ground in other states.⁹²

This account of climate-related hazards is intended to be illustrative, not exhaustive.⁹³ It should be sufficient to establish that fossil fuel-induced global

pollution exposure has increased mortality for those infected with SARS-CoV-2. See Claudia L. Persico & Kathryn R. Johnson, *The Effects of Increased Pollution on COVID-19 Cases and Deaths*, J. ENV’T ECON. & MGMT., May 2021, at 1 (finding that increases in fossil-fuel pollution are associated with a “10.6 percent increase in deaths from COVID-19”).

88. See *supra* text accompanying notes 24–26.
89. Many view the 2006 Syrian drought—the worst since 1930, creating 1.5 million internal refugees, stoking that nation’s civil war, estimated to be responsible for more than 500,000 deaths and, in substantial part, for the rise of the Islamic State of Iraq and Syria (ISIS)—as among the first major climate-related national security issues impacting the United States. See Colin P. Kelley et al., *Climate Change in the Fertile Crescent and Implications of the Recent Syrian Drought*, 112 PROCEEDINGS NAT’L. ACAD. SCIS. 3241, 3241 (2015); see generally *Syria’s Civil War: The Descent Into Horror*, COUNCIL ON FOREIGN RELS. (Feb. 14, 2023), <https://perma.cc/3CCL-Q3X6>; U.S. INST. OF PEACE, USIP’S WORK IN SYRIA 1 (Sep. 2020), <https://perma.cc/YE6L-KYRJ>.
90. Michael D. McDonald, *Climate Change Has Central Americans Fleeing to the U.S.*, BLOOMBERG (June 8, 2021), <https://perma.cc/U3LM-4UN2>; Jonathan Blitzer, *How Climate Change is Fueling the U.S. Border Crisis*, NEW YORKER (Apr. 3, 2019), <https://perma.cc/QT44-8Q3V>; Kirk Semple, *Central American Farmers Head to the U.S., Fleeing Climate Change*, N.Y. TIMES (Apr. 13, 2019) <https://perma.cc/9ZYR-XXL9>; Nicholas Kristof, ‘Food Doesn’t Grow Here Anymore. That’s Why I Would Send My Son North.’, N.Y. TIMES (June 5, 2019) <https://perma.cc/GAJ3-9CYR>.
91. Henry Fountain, *Global Warming’s Deadly Combination: Heat and Humidity*, N.Y. TIMES (Mar. 8, 2021), <https://perma.cc/P3EY-AKFP> (discussing Yi Zhang, et al., *Projections of Tropical Heat Stress Constrained by Atmospheric Dynamics*, 14 NATURE GEOSCIENCE 133 (2021)).
92. See ORRIN H. PILKEY & KEITH C. PILKEY, *SEA LEVEL RISE: A SLOW TSUNAMI ON AMERICA’S SHORES 3* (2019) (predicting that millions of people along the Gulf and Atlantic Coastal plains and primarily from Florida will become “a stream of refugees moving to higher ground”).
93. An exhaustive account of climate-related deaths is well beyond the scope of this Article. Moreover, because of the complex, unprecedented, globally altering nature of the matter, new climate-related hazards are continually cropping up, from ordinary sidewalks and handrails causing third-degree burns in seconds to “zombie viruses” released from melting permafrost. Amy Silverman, ‘The Burns Can Cook Them’: *Searing Sidewalks Cause Horrific Injuries in Us*, THE GUARDIAN (Aug. 28, 2023), <https://perma.cc/5L5V-QP6S>; Michael

warming has killed many thousands of Americans and, if it continues unabated, may kill millions.

B. FFCs Are Generating “Globally Catastrophic” Risks

The above discussion captures only a small fraction of past and potential climate-related deaths. And while homicide liability in the U.S. obtains only for U.S. deaths, it is worth considering global hazards as well, as those harms and FFCs’ projections and awareness of them may be relevant evidence to a fact-finder in a U.S. homicide proceeding.

A growing number of scientific studies estimate that, within the next fifty years, climate harms will become, in the words of the FFCs themselves, “globally catastrophic,” endangering significant proportions of humanity.⁹⁴ For example, the U.S. could avoid an estimated 4.5 million deaths from air pollution over the next 50 years by cutting emissions to levels consistent with keeping temperatures below 2°C.⁹⁵

Globally, once temperatures rise by 2°C, researchers estimate that increased temperatures will cause hundreds of millions of additional deaths; air pollution will account for over 100 million additional deaths;⁹⁶ the death toll from flooding will rise by 50 percent globally;⁹⁷ an additional 400 million people will face water insecurity;⁹⁸ and crop yields could fall by 20 percent, driving up food prices and exposing tens of millions more people to food insecurity and starvation.⁹⁹ Globally, “critical regions of food production” would be “swamped,”¹⁰⁰ and nearly 200 million people would be displaced, including entire Pacific island nations,¹⁰¹ though many of these places will already have been rendered uninhabitable by extreme heat and humidity.

Birnbaum & Ellen Francis, *‘Zombie’ Viruses Are Thawing in Melting Permafrost Because of Climate Change*, WASH. POST (Dec. 2, 2022), <https://perma.cc/926Z-KXJJ>.

94. See *supra* note 1 for FFC use of the phrase “globally catastrophic.” As to growth in research, a Google Scholar search for the phrase “catastrophic climate change” yields approximately 2,500 articles published from 2000 to 2010, and approximately 8,500 articles from 2010-2020.

95. *The Devastating Impacts of Climate Change on Health: Hearing Before H. Comm. on Oversight & Reform*, 116th Cong. 1 (2020) (statement of Drew Shindell, Distinguished Professor of Earth Sciences, Duke University), <https://perma.cc/8ESQ-UAFP>.

96. See WALLACE-WELLS, *supra* note 35, at 28 (citing Drew Shindell, et al., *Quantified, Localized Health Benefits of Accelerated Carbon Dioxide Emissions Reductions*, 8 NATURE CLIMATE CHANGE 291 (2018)).

97. From 1995 to 2015, about 157,000 people died from flooding. *Id.* at 68. That is an average of 7,850 per year. Fifty percent of that number is 3,925.

98. *Id.* at 13.

99. *Id.* at 49.

100. Doyle Rice, *Earth’s Oceans Could Rise Over 6 Feet by 2100 as Polar Ice Melts, Swamping Coastal Cities Such as NYC*, USA TODAY (May 20, 2019), <https://perma.cc/5FY4-MDPC>.

101. Adam Vaughan, *Sea Level Rise Could Hit 2 Metres by 2100 – Much Worse Than Feared*, NEW SCIENTIST (May 20, 2019), <https://perma.cc/ZD5A-5ZWD> (discussing Jonathan L.

Alarming, the median projection for warming by 2100 under current policies is nearly 3°C,¹⁰² a level of temperature increase that could “unleash suffering beyond anything that humans have ever experienced.”¹⁰³ Even more concerning, one in six models forecasts 4°C or above, a level at which it is uncertain that most humans would survive.¹⁰⁴ And this is according to IPCC estimates that many experts believe are too conservative, in part because they do not account for tipping points and feedback loops that could dramatically increase warming.¹⁰⁵ One recent study concludes that feedback effects could lead to a

Bamber et al., *Ice Sheet Contributions to Future Sea-level Rise from Structured Expert Judgment*, 116 PROCEEDINGS NAT'L ACAD. SCI. 11195 (2019)).

102. *Temperatures*, CLIMATE ACTION TRACKER (Nov. 11, 2022), <https://perma.cc/T8MX-ZHYE>.

103. WALLACE-WELLS, *supra* note 35, at 31.

104. *See, e.g.*, Turn Down the Heat, *supra* note 20, at xiv (“[T]here is also no certainty that adaptation to a 4°C world is possible.”).

105. *See, e.g.*, Jorgen Randers & Ulrich Goluke, *An Earth System Model Shows Self-Sustained Thawing of Permafrost Even If All Man-Made GHG Emissions Stop in 2020*, 10 SCI. REPS., Nov. 12 2020, at 30 (“[The] latest IPCC special report underplays an[] alarming fact: global warming is accelerating. Three trends. . . will combine over the next 20 years to make climate change faster and more furious than anticipated.”). One reason climate models understate climate impacts is that humans have never lived through such rapid warming. *See* Paola A. Arias et al., *Technical Summary*, in INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2021—THE PHYSICAL SCIENCE BASIS: CONTRIBUTION OF WORKING GROUP I TO THE SIXTH ASSESSMENT REPORT OF THE IPCC 35, 59 (2021) (describing the “lack of observations” as hampering understanding of such rapid climate change).

Integrating tipping points into climate models remains challenging. *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2021: THE PHYSICAL SCIENCE BASIS 59 (2021) (“Establishing links between specific [global warming levels] with tipping points and irreversible behaviour is challenging due to model uncertainties and lack of observations, but their occurrence cannot be excluded, and their likelihood of occurrence generally increases at greater warming levels.”); GLOBAL TIPPING POINTS 177 (Timothy M. Lenton et al., eds. 2023) (“So far, systematic assessments of the impacts of climate change on people and ecosystems presented in policy-relevant reports such as those of the Intergovernmental Panel on Climate Change (IPCC) and Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) have generally included little information on the implications for human societies of passing tipping points in the Earth system. This is also true of broader economic modelling of climate damages.”).

But IPCC analyses have been characterized as conservative even on core, well-modeled phenomena. For example, the IPCC omits the worst 5 percent of modeled outcomes. When those outcomes were included, the high end of IPCC’s 2014 estimates rose from 4.8°C to 7.8°C. *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2014 SYNTHESIS REPORT: SUMMARY FOR POLICYMAKERS 10, 20 (2014); *see also* Yangyang Xu & Veerabhadran Ramanathan, *supra* note 24, at 10315 (characterizing the effects of warming greater than 5°C as “unknown, implying beyond catastrophic, including existential threats”); *id.* at 10317 (temperature ranges and probability); Timony N. Lenton et al., *Climate Tipping Points—Too Risky to Bet Against*, 575 NATURE 592, 592 (2019) (reviewing “the effects of such large-scale changes, how quickly they might unfold and whether we still have any control over them”). The most recent high-end IPCC projection is 4.4°C. *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2023 SYNTHESIS REPORT: SUMMARY FOR POLICYMAKERS 12 (2023).

runaway global warming trend, termed a “Hothouse Earth,” where global temperatures might inexorably rise and then stabilize at 5°C, with humanity helpless to reverse course.¹⁰⁶

There is enough uncertainty about potential tipping points that scientists worry they might be triggered at any time.¹⁰⁷ That is, any additional combustion of fossil fuels could cross the line from the dire and globally catastrophic forecasts of the IPCC to nearly unthinkable feedback loop scenarios they explicitly do not model. Due to the delayed effects of carbon emissions, we cannot say when or how these feedback loops might interact with each other and trigger tipping points. But with every additional metric ton of greenhouse gas pollution, FFCs are playing an extremely lethal and profitable form of Russian Poker with millions of lives in the United States.¹⁰⁸

C. FFCs Have Long Been Aware of the Risks They Generated

Although much of the general public is only recently becoming aware of the severity and urgency of climate harms,¹⁰⁹ FFCs have long known about the cataclysmic effects of fossil fuels on our climate. FFCs understood climate science as far back as the 1950s and had scientists working in the field by the 1970s. FFCs also realized at that time that fossil fuel combustion was likely to cause catastrophic harm in the next 100 years, possibly sooner. Crucially, they were also aware that curtailing fossil fuel combustion would prevent the catastrophic outcomes about which internal and external experts repeatedly warned them. Consider just a handful of highlights from the public record, decade by decade.¹¹⁰

106. Will Steffen et al., *Trajectories of the Earth System in the Anthropocene*, 115 PROCEEDINGS NAT'L ACAD. SCI. 8252, 8254 (2018) (“[A] cascade of feedbacks could push the Earth System irreversibly onto a ‘Hothouse Earth’ pathway.”); *Planet at Risk of Heading Towards ‘Hothouse Earth’ State*, *supra* note 19.

107. See David I. Armstrong McKay et al., *Exceeding 1.5°C Global Warming Could Trigger Multiple Climate Tipping Points*, SCI., Sept. 9, 2022, at 7 (“We cannot rule out that [key] tipping points have already been passed . . . and several other tipping elements have minimum threshold values within the 1.1 to 1.5°C range Crossing these CTPs can generate positive feedbacks that increase the likelihood of crossing other CTPs.”); see also Randers & Goluke, *supra* note 105, at 1 (describing models estimating that we have already passed a tipping point).

108. There is precedent for runaway effects of this kind. Four of the five major mass extinctions in Earth’s history—all except the one in which an asteroid struck the earth and killed the dinosaurs—were caused by similar greenhouse gas-induced climate change. WALLACE-WELLS, *supra* note 35, at 3; see generally PETER BRANNEN, *THE ENDS OF THE WORLD: VOLCANIC APOCALYPSES, LETHAL OCEANS, AND OUR QUEST TO UNDERSTAND EARTH’S PAST MASS EXTINCTIONS* (2017).

109. It was not until 2019 that over 50 percent of the American public was “very” or “extremely” sure that global warming was really happening. ANTHONY LEISEROWITZ ET AL., *CLIMATE CHANGE IN THE AMERICAN MIND* 7 (2022).

110. For the sake of convenience, this Article often discusses evidence regarding a particular FFC as relevant to FFCs generally. Much of the discussion involves ExxonMobil because

A century after the greenhouse gas effect was first described,¹¹¹ the American Petroleum Institute (“API”) and executives of major oil companies learned of scientific research into fossil fuel-driven climate change and some of the threats that greenhouse gas pollution posed when, in 1954, California Institute of Technology scientists shared findings estimating that fossil fuel combustion had caused a 5 percent increase in atmospheric CO₂ from 1854 to 1954.¹¹² The next year, API began funding additional research,¹¹³ and in 1957, scientists at Humble Oil (now ExxonMobil) published a paper finding that fossil fuel combustion causes increases in atmospheric CO₂.¹¹⁴ Closing out the decade in 1959, physicist Edward Teller told fossil fuel industry executives gathered at an API event celebrating the industry’s 100th anniversary that, because fossil fuel emissions would “melt the icecap and submerge New York” and “coastal regions,” in which a “considerable percentage of the human race lives,” humanity needed to find new sources of energy.¹¹⁵

In the 1960s, FFCs continued to engage with scientific research on carbon-driven climate change, with the President of the API noting in 1965 that one of “the most important predictions” from recent research was that “carbon dioxide is being added to the earth’s atmosphere by the burning of coal, oil, and

more evidence is publicly available regarding that company than others. In a prosecution, of course, the state would be required to produce evidence sufficient to convict the specific defendant in the case or, in a conspiracy or racketeering case, all of them together. Much of the evidence of FFCs’ awareness is reported in Franta, *supra* note 11; Supran & Oreskes, *supra* note 11, also reviews much of the internal predictions of climate change. But more evidence comes to light each year, and it seems like leaks will continue to paint an increasingly damning picture. During the editing of this article, for example, the Wall Street Journal published another exposé of the divergence between internal knowledge of climate change at Exxon and external statements by then CEO Rex Tillerson. Christopher M. Matthews & Collin Eaton, *Inside Exxon’s Strategy to Downplay Climate Change*, WALL ST. J. (Sept. 14, 2023), <https://perma.cc/XWE8-RR2U>.

111. Eunice Foote, *Circumstances Affecting the Heat of Sun’s Rays*, 22 AM. J. ART & SCI. 382 (1856).
112. Benjamin Franta, *Early Oil Industry Knowledge of CO₂ and Global Warming*, 8 NATURE CLIMATE CHANGE 1024, 1024 (Dec. 2018). Asked to speak about “energy in the future,” Edward Teller pointed out that a 10 percent increase in atmospheric CO₂ would be “sufficient to melt the icecap and submerge New York.” See *infra* note 126. “All the coastal cities would be covered,” he continued, “and since a considerable percentage of the human race lives in coastal regions, I think that this chemical contamination is more serious than most people tend to believe.” Then he quipped that he was not sure whether the Empire State Building would be submerged, but “anyone can calculate it” by observing that the ice over Greenland and Antarctica is “perhaps five thousand feet thick.” *Id.*
113. See Franta, *supra* note 112, at 1024.
114. H.R. Brannon et al., *Radiocarbon Evidence on the Dilution of Atmospheric and Oceanic Carbon by Carbon from Fossil Fuels*, 38 TRANSACTIONS AM. GEOPHYSICAL UNION 643, 643 (1957). This paper engaged with prior work, including the Caltech research, which had not been published, and with which it agreed, demonstrating that Humble Oil scientists were keeping up with the latest research on fossil fuels and atmospheric CO₂. Franta, *supra* note 112, at 1024.
115. Benjamin Franta, *On Its 100th Birthday in 1959, Edward Teller Warned the Oil Industry About Global Warming*, THE GUARDIAN (Jan. 1, 2018), <https://perma.cc/7JA9-9V3B>.

natural gas,” causing “marked changes in climate.”¹¹⁶ API then commissioned additional research by the Stanford Research Institute that showed “rising levels of CO₂ would likely result in rising global temperatures and . . . if temperatures increased significantly, the result could be melting ice caps, rising sea levels, warming oceans, and serious environmental damage on a global scale.”¹¹⁷

By the 1970s, Exxon Scientific Advisor James F. Black was warning the company’s Management Committee of broad scientific agreement that temperature increases related to fossil fuel combustion would cause the agricultural output of entire nations to be “reduced or destroyed,”¹¹⁸ and that humanity had “a time window of five to ten years before the need for hard decisions regarding changes in energy strategies might become critical.”¹¹⁹ In 1979, in response to a request by an Exxon vice president, Exxon researchers produced a memorandum warning that there would be “dramatic environmental effects before the year 2050” if fossil fuel use continued unabated,¹²⁰ that “ocean levels would rise four feet,” that the melting of polar ice caps would redistribute weight and pressure on the earth’s crust, possibly triggering “major increases in earthquakes and volcanic activity,” and that increased temperatures and related effects would render the entire tropics “less habitable.”¹²¹

FFCs continued to be deeply engaged with climate science throughout the 1980s.¹²² API began the decade with a task force meeting which included

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116. Frank N. Ikard, Presentation at the 45th Annual Meeting of the Am. Petroleum Inst.: Meeting the Challenges of 1966 (Nov. 8, 1965)(unpublished report) (on file with ClimateFiles).
117. CARROLL MUFFETT & STEVEN FEIT, *SMOKE AND FUMES: THE LEGAL AND EVIDENTIARY BASIS FOR HOLDING BIG OIL ACCOUNTABLE FOR THE CLIMATE CRISIS* 12 (Amanda Kistler & Marie Mekosh eds., 2017). The research not only revealed that atmospheric CO₂ was “steadily increasing,” it also estimated that “90 percent of this increase could be attributed to fossil fuel combustion.” *Id.* at 12.
118. Neela Banerjee et al., *Exxon’s Own Research Confirmed Fossil Fuels’ Role in Global Warming Decades Ago*, INSIDECLIMATE NEWS (Sept. 16, 2015), <https://perma.cc/33MK-K2Q8> (quoting a 1978 presentation by climate scientist James Black).
119. *Id.* Exxon also proposed a research program “on the greenhouse effect” to the National Oceanic and Atmospheric Administration. Edward A. Garvey et al., 1979 Exxon Report on Greenhouse Effect for NOAA (Mar. 26, 1979) (unpublished report) (on file with ClimateFiles).
120. Memorandum from W.L. Ferrall to R.L. Hirsch on Controlling the CO₂ Concentration in the Atmosphere (Oct. 16, 1979) (on file with ClimateFiles). The memorandum makes clear that fossil fuel use could be curtailed in response to “adverse environmental effects” from global warming. *Id.* at 1 (noting that global warming could lead to policy limits on fossil fuel usage).
121. *Id.* at App. A.
122. A 1980 Exxon “Technological Forecast” states that fossil fuel combustion would be the most significant source of increasing atmospheric CO₂, which could double as soon as 2035. The 1980 forecast states that the “most widely accepted calculations” indicate that a doubling of atmospheric CO₂ would lead to a temperature rise of 3°C ±1.5°C and notes that more modest predictions exist but “are not held in high regard by the scientific community.” Memorandum from Henry Shaw, to T.K. Kett, Technological Forecast on CO₂ Greenhouse Effect 2 (Dec. 18, 1980) (on file with ClimateFiles). A separate 1980 memo by a senior vice president

members from Exxon, Texaco, and Amoco (now part of BP), the minutes of which summarize the “likely impacts” as “1°C rise (2005): barely noticeable,” “2.5°C rise (2038): major economic consequences, strong regional dependence,” and “5°C rise (2067): globally catastrophic effects.”¹²³ The minutes also note that although “significant impact[s]” may not be felt for “very roughly 50 yrs,” there is “no leeway” in the time for action.¹²⁴ Shortly thereafter API produced a summary of existing research reporting that that climate scientists expect fossil fuel use to drive a doubling of atmospheric CO₂ “sometime in the next century”¹²⁵ with “serious consequences” for the survival of humanity.¹²⁶

and member of Exxon’s board was also sufficiently aware of the scientific literature to engage in a scientific argument with a company scientist about the role of oceans in storing or releasing CO₂. Neela Banerjee, *More Exxon Documents Show How Much It Knew About Climate 35 Years Ago*, INSIDE CLIMATE NEWS (Dec. 1, 2015), <https://perma.cc/N6AM-BEV3>. Scientists employed by FFCs also continued to publish scientific papers furthering the scientific understanding of climate change as a response to increased carbon emissions. See, e.g., Martin I. Hoffert & Brian P. Flannery, *Model Projections of the Time-Dependent Response to Increasing Carbon Dioxide* in PROJECTING THE CLIMATIC EFFECTS OF INCREASING CARBON DIOXIDE 151–68 (1985).

123. Minutes from Am. Petroleum Inst. CO₂ and Climate Task Force 13 (Feb. 29, 1980) (on file with ClimateFiles). The minutes also note that “a 3% per annum growth rate of CO₂” would bring “world economic growth to a halt” in mere decades. *Id.* at 16.
124. *Id.* at 15. On the bright side, the 1980 technological forecast and 1982 memorandum state (without explanation) that participants in a recent scientific workshop on global warming felt that the problem was “not as significant to mankind as a nuclear holocaust or world famine.” H. SHAW & P.P. McCALL, EXXON RESEARCH AND ENGINEERING COMPANY’S TECHNOLOGICAL FORECAST CO₂ GREENHOUSE EFFECT 4 (1980); Memorandum from M.P. Glaser, to Exxon Management on CO₂ Greenhouse Effect 14 (Nov. 12, 1982) (on file with ClimateFiles).
125. ALAN OPPENHEIM & WILLIAM L. DONN, AM. PETROLEUM INST., CLIMATE MODELS AND CO₂ WARMING: A SELECTIVE REVIEW AND SUMMARY 4 (1982). Also in 1982, the President of Exxon Research and Engineering Company wrote, “[f]ew people doubt that the world has entered an energy transition away from dependence upon fossil fuels and toward some mix of renewable resources that will not pose problems of CO₂ accumulation.” Edward E. David Jr., President, Exxon Rsch. and Eng’g Co., *Inventing the Future: Energy and the CO₂ “Greenhouse” Effect*, Remarks at the Fourth Ann. Ewing Symp. (Oct. 26, 1982) (on file with ClimateFiles). He recognized in the same piece that the most important question regarding climate risk concerned not the science itself, but how people would choose to react to it: “It is ironic that the biggest uncertainties about the CO₂ buildup are not in predicting what the climate will do, but in predicting what people will do.” *Id.* at 2.
126. See OPPENHEIM & DONN, *supra* note 125, at 5. The same year, Exxon Sciences Lab Director Roger Cohen wrote of “unanimous agreement in the scientific community that a temperature increase of [3°C ± 1.5°C] would bring about significant changes in the earth’s climate, including rainfall distribution and alterations in the biosphere.” Cohen noted that, despite unanimity regarding the prediction that global warming would cause major climate changes, not everyone agreed with the “consensus prediction” of how much warming would occur. He then explained that new research by Exxon scientists “reconcile[d]” the objection with the “consensus.” Letter from Roger Cohen, Dir. of Theoretical and Mathematical Sci. Lab’y at Exxon Rsch. and Eng’g Co., to A.M. Natkin, Exxon Corp. Office of Sci. and Tech. (Sept. 2, 1982), *reprinted in* Lisa Song et al., *Exxon Confirmed Global Warming Consensus in*

The release of the first IPCC report in 1990 and the related growth in global awareness of climate change among political elites accelerated FFCs' engagement with climate science and research.¹²⁷ Exxon's lead climate scientist began contributing to IPCC reports and published over a dozen important scientific articles on climate science throughout the decade.¹²⁸ Prominent publications by FFC scientists confirmed the link between carbon emissions and climate change, and many are among the most commonly cited articles describing and refining the science of climate change.¹²⁹ The 1990s also marked the adoption of climate change as part of corporate industrial engineering by FFCs, with platform and refinery planning explicitly incorporating management of rising sea levels and more energetic storms as necessary aspects of physical infrastructure development.¹³⁰

In the first decade of the twenty-first century, FFCs' engagement with climate science increased even further, with Exxon scientists publishing over two dozen scientific articles related to the topic.¹³¹ Both internal and external scientific studies by FFCs all supported the consensus scientific link between FFC-driven carbon emissions and climate change. With the release of the documentary film "An Inconvenient Truth" in the middle of the decade,¹³² awareness of these models and their consequences reached new heights. Of course, FFCs were already well aware of all of the science described in the documentary. Indeed, retrospective reviews have demonstrated that Exxon's climate projections from 1977 onward were astonishingly accurate.¹³³

In sum, for several decades FFCs have understood the fundamentals of how their conduct was driving climate change, and that the consequences would very likely be globally catastrophic for humanity.¹³⁴ FFCs needed to gain accurate

1982 with *In-House Climate Models*, INSIDE CLIMATE NEWS (Sept. 22, 2015), <https://perma.cc/YXS9-N8LT>.

127. To gain some sense of the rise in engagement with climate science, consider that the number of scientific publications by Exxon scientists increased from 3 in the 1980s to 18 in the 1990s. See *Exxon Mobil Contributed Publications*, EXXONMOBIL, <https://perma.cc/NC8Q-ZMY8>.

128. *Id.*

129. See, e.g., the scholarship of Haroon S. Kheshgi with 13,726 citations and an h-index of 45. In addition to his position at the University of Illinois, Kheshgi is the Global Climate Change Program Leader at ExxonMobil's Corporate Strategic Research. *Haroon Kheshgi*, GOOGLE SCHOLAR, <https://perma.cc/CUC2-WHDZ>.

130. Lieberman & Rust, *supra* note 12.

131. *Exxon Mobil Contributed Publications*, *supra* note 133.

132. AN INCONVENIENT TRUTH (Paramount Classics 2006).

133. Supran & Oreskes, *supra* note 11, at 1 (describing the accuracy of internal models over decades and contradictory public statements).

134. Indeed, some argue there have been no major breakthroughs in climate science since 1979. See Nathaniel Rich, *Losing Earth: The Decade We Almost Stopped Climate Change*, N.Y. TIMES (Aug. 1, 2018), <https://perma.cc/2WB8-4JJ5> ("Ken Caldeira, a climate scientist at the Carnegie Institution for Science in Stanford, Calif., has a habit of asking new graduate students to name the largest fundamental breakthrough in climate physics since 1979. It's a trick

insights into climate change not only because they needed to understand how sea level rise and other aspects of climate change would impact their industrial operations, but also because they needed to understand its potential impact on market share and future profits. They understood the most likely policy response to global warming would be “curtailment of fossil fuel consumption,”¹³⁵ and most of the relevant documents explicitly or implicitly focus on defending the company’s business interests.¹³⁶ In discussing the scientific research, communications to senior management often highlight the risk that, for example, “future public decisions aimed at controlling the build-up of atmospheric CO₂ could impose limits on fossil fuel combustion,”¹³⁷ and that there might be “limitations”

question. There has been no breakthrough. As with any mature scientific discipline, there is only refinement. The computer models grow more precise; the regional analyses sharpen; estimates solidify into observational data. Where there have been inaccuracies, they have tended to be in the direction of understatement. Caldeira and a colleague recently published a paper in *Nature* finding that the world is warming more quickly than most climate models predict. The toughest emissions reductions now being proposed, even by the most committed nations, will probably fail to achieve ‘any given global temperature stabilization target.’ Strikingly, in 2021, the IPCC documented that very little has changed with respect to temperature estimates since the first synthesis published by the National Academy of Sciences in 1979 through every IPCC report since the first in 1990. *Compare* INTER-GOVERNMENTAL PANEL ON CLIMATE CHANGE, 2021 TECHNICAL SUMMARY 94 (2021), *with* NAT’L RSCH. COUNCIL, CARBON DIOXIDE AND CLIMATE: A SCIENTIFIC ASSESSMENT 14 (1979).

135. 1982 Memorandum from Martin Glaser to Exxon Management, *supra* note 44, at 29; *id.* at 2 (stating that mitigating global warming “would require major reductions in fossil fuel combustion”).
136. *See, e.g.*, Andrew Callegari, Presentation on “CO₂ Greenhouse Effect” and Exxon Climate Modeling 15 (Aug. 24, 1982) (on file with ClimateFiles) (“Q. Why is Exxon doing this work? A. In order to gain capability for critical evaluation of developments in a field which could impact on future energy policy.”); Memorandum from H. Shaw to H. N. Weinberg on Research in Atmospheric Science 2 (Nov. 19, 1979) (on file with ClimateFiles) (“It behooves us to start a very aggressive defensive program in the indicated areas of atmospheric science and climate because there is a good probability that legislation affecting our business will be passed. Clearly, it is in our interest for such legislation to be based on hard scientific data.”); Letter from Henry Shaw to Dr. Edward E. Davis, Jr. 2 (Dec. 7, 1978) (on file with InsideClimate News) (“The rationale for Exxon’s involvement and commitment of funds and personnel is based on our need to assess the possible impact of the greenhouse effect on Exxon business.”). There is at least one instance of an Exxon employee arguing that the company had an “ethical responsibility to permit publication” of study results that might attract unwanted media attention, despite that it accorded with mainstream climate science, merely because of the source. Letter from Roger W. Cohento to A.M. Natkin 3 (Sept. 2, 1982) (on file with ClimateFiles).
137. Memorandum from N.R. Werthamer to H.N. Weinberg on CO₂ Greenhouse Communications Plan 1 (July 8, 1980) (on file with ClimateFiles); *see also* Memorandum from J.F. Black, Products Research Division, Exxon Research and Engineering Co., to F.G. Turpin, Vice President, Exxon Research and Engineering Co., at 2 (June 6, 1978) (on file with ClimateFiles) (suggesting in 1977 that it could become “critical” for humanity to make “hard decisions regarding changes in energy strategies” in five to ten years).

on fossil fuels¹³⁸ with potentially “irreversible” harms to FFCs profits.¹³⁹ It is notable, in this respect, that much of the research not only highlights the effects of fossil fuel-driven climate change but also describes the decades-long lag between the burning of fossil fuels and the major impacts that might drive profit-reducing regulation.¹⁴⁰ By this time, FFCs had been made well aware that, as one Exxon researcher put it, if “policy actions to control the increased CO₂ loading of the atmosphere are delayed until climate changes resulting from such an increase are discernible, then it is likely that they will occur too late to be effective.”¹⁴¹

D. FFCs Worked to Obscure Risks They Were Generating

The same profit motive that moved FFCs to understand the relationship between their business practices and climate change also led them to produce extensive external communications designed to obscure the climate science that their own researchers and others produced. Particularly when speaking to policymakers and the public, FFCs exaggerated the uncertainties around global warming. The most aggressive phases of denial occurred during the most significant pushes for climate policy making, such as lobbying over the Kyoto Protocol in the late 1990s and major U.S. climate legislation in 2009.¹⁴²

One tactic employed by FFCs was to present false and misleading information to investors. For example, in response to a 1990 shareholder petition asking the company to develop a plan to reduce CO₂ emissions, Exxon stated that its “examination of the issue supports the conclusions that the facts today and the projection of future effects are very unclear.”¹⁴³ In 1996, Exxon published “Global warming: who’s right?” Warning against “precipitous, poorly considered action

138. Duane G. Levine, Presentation on Potential Enhanced Greenhouse Effects (Feb. 22, 1989 (on file with ClimateFiles) (“Failure to understand the need for substantial advances in the science to reduce the uncertainty and extreme variability in the projections can lead to premature limitations on fossil fuels”).

139. *Id.* (“Arguments that we can’t tolerate delay and must act now can lead to irreversible and costly Draconian steps.”).

140. *See, e.g.*, Memorandum from Marvin Glaser to Exxon management on CO₂ Greenhouse Effect: A Technical Review (April 1, 1982) (on file with ClimateFiles).

141. Memorandum from Henry Shaw to D.E. Smiley on National Commission on Air Quality CO₂ Workshop Draft Statement of Findings and Recommendations 4 (Dec. 5, 1980) (on file with ClimateFiles) [hereinafter Input to Congressional Commission].

142. *See, e.g.*, Scott Waldman & Benjamin Hulac, *This Is When the GOP Turned Away from Climate Policy*, E&E News (Dec. 5, 2018), <https://perma.cc/ERK4-9UEW> (“Those who think we are powerless to do anything about the greenhouse effect forget about the ‘White House effect.’”); United Nations Framework Convention on Climate Change, May 9, 1992, 1771 U.N.T.S. 107; Kyoto Protocol to the United Nations Framework Convention on Climate Change, Nov. 12, 1997, 2303 U.N.T.S. 162; and H.R. 2454, 111th Cong. (2009).

143. Sara Jerving et al., *What Exxon Knew about the Earth’s Melting Arctic*, L.A. TIMES (Oct. 9, 2015), <https://perma.cc/NVV5-KYS5>.

on climate change,” it claimed that “scientific evidence remains inconclusive as to whether human activities affect global climate” and evidence to the contrary was “bad science.”¹⁴⁴ In its 2005 Corporate Citizenship Report, ExxonMobil stated that “gaps in the scientific basis for theoretical climate models and the interplay of significant natural variability make it very difficult to determine objectively the extent to which recent climate changes might be the result of human actions.”¹⁴⁵ The Royal Society wrote a letter expressing “disappointment” over “inaccurate and misleading” statements about climate science¹⁴⁶—and noted that the statements contradicted the IPCC and other research to which Exxon scientist Haroon Kheshgi contributed as an author.¹⁴⁷

Industry executives also made public statements disputing their company’s own climate science. Exxon CEO Lee Raymond declared carbon-driven climate change an “unproven theory”¹⁴⁸ based on inconclusive science.¹⁴⁹ He claimed that “96 percent of the carbon dioxide entering the atmosphere is produced by nature and is beyond our control,”¹⁵⁰ and that “the scientific evidence is inconclusive as to whether human activities are having a significant effect on the global climate.”¹⁵¹ Incredibly, he claimed in 1997, then the hottest year on record,¹⁵² that the earth was “cooler today than it was 20 years ago.”¹⁵³ Flatly contradicting his own company’s research and that of every reputable climate scientist, he asserted that it was “highly unlikely that the temperature in the middle of the next century will be affected whether policies are enacted now or 20 years from now.”¹⁵⁴

The gap between FFCs’ public stance and the research was also starkly demonstrated in a 2012 speech at the Council on Foreign Relations by

144. LEE R. RAYMOND & JONATHAN ADLER, *GLOBAL WARMING: WHO’S RIGHT? FACTS ABOUT A DEBATE THAT’S TURNED UP MORE QUESTIONS THAN ANSWERS* 2–3 (1996).

145. Letter from Bob Ward, Senior Manager, Policy Communication, Royal Society, to Nick Thomas, Dir., Corp. Affs. Ezzo UK Limited (Sept. 4, 2006), <https://perma.cc/9UPA-PD69>.

146. *Id.* It is not obvious on the face of the letter that it is from the Society rather than just one employee, but the organization represents it as a Royal Society letter.

147. *Id.* Indeed, Exxon scientists published 53 peer-reviewed papers on climate-related topics from 1983 to 2014, and each one agrees with the broad scientific consensus that humans cause global warming. Dana Nuccitelli, *Two-faced Exxon: The Misinformation Campaign Against Its Own Scientists*, *THE GUARDIAN* (Nov. 25, 2015), <https://perma.cc/U3UG-TNC2>.

148. Supran & Oreskes, *supra* note 11, at 6.

149. Lee Raymond, Chairman, Exxon Corp., Speech at the Annual Meeting of the American Petroleum Institute 3 (Nov. 11, 1996) (on file with ClimateFiles).

150. *Id.* at 4.

151. David Hasemyer & John H. Cushman Jr., *Exxon Sowed Doubt About Climate Science for Decades by Stressing Uncertainty*, *INSIDECLIMATE NEWS* (Oct. 22, 2015), <https://perma.cc/LA7F-PZQ2>.

152. *Id.*

153. *Id.*

154. Lieberman & Rust, *supra* note 12.

ExxonMobil CEO Rex Tillerson.¹⁵⁵ Fears about climate change were not based on science, Tillerson stated, but rather were the product of an “illiterate” public and a “lazy” press.¹⁵⁶ Tillerson knew this, he claimed, because ExxonMobil had been “working with a very good team at MIT” for more than 20 years on climate modeling, and their “ability to predict, with any accuracy, what the future’s going to be is really pretty limited.”¹⁵⁷ Ronald Prinn, Director of the Center for Global Change Science at MIT (the lead researcher on the “very good team” to which Tillerson referred) responded quickly by contradicting Tillerson, stating that action on climate “cannot wait” and that the group’s models “clearly show the benefits of mitigation policies compared to no policy, in lowering risks.”¹⁵⁸

FFCs also spoke for themselves in advertisements and “advertorials,” or paid content on the editorial pages of newspapers. From 1990 through 2005, Exxon ran ads in *The Washington Post*, the *Wall Street Journal*, and *The New York Times* casting doubt on climate science and saying it was too early to regulate the problem.¹⁵⁹ These made patently false claims like, “greenhouse-gas emissions, which have a warming effect, are offset by another combustion product—particulates—which leads to cooling;”¹⁶⁰ and, “[s]cientists cannot predict with certainty if temperatures will increase, by how much and where changes will occur. We still don’t know what role man-made greenhouse gasses might play in warming the planet.”¹⁶¹

These were not disconnected statements; rather they were the result of extensive collaborative efforts among FFCs to develop disinformation strategies. For example, in 1998, API drafted a communications plan, with the principal goal of “defeat[ing]” the Kyoto Protocol, emphasizing that victory could not be declared by FFCs until “no further efforts to thwart the threat

155. Interview by Alan S. Murray with Rex W. Tillerson, Chairman and CEO, Exxon Mobil Corporation (Jun. 27, 2012), <https://perma.cc/SW6K-H7WZ>.

156. *Id.*; Martha C. White, *ExxonMobil CEO assailed for claims on climate change*, NBC NEWS (Jun. 28, 2012), <https://perma.cc/ZKA9-5HNQ>.

157. Murray, *supra* note 155.

158. White, *supra* note 156.

159. Katie Jennings et al., *How Exxon Went from Leader to Skeptic on Climate Change Research*, L.A. TIMES (Oct. 23, 2015), <https://perma.cc/WHB8-HHM3>. Exxon placed an advertorial every Thursday in *The New York Times* from 1972 to 2001. Supran & Oreskes, *supra* note 11, at 2.

160. Supran & Oreskes, *supra* note 11, at 13–14. Small particulate matter reduces warming while it remains in the air. Indeed, some now theorize that a recent 10 percent reduction in sulfur dioxide pollution from shipping led to a spike in sea surface temperatures. *See, e.g.*, Zeke Hausfather & Piers Forster, *Analysis: How Low-sulphur Shipping Rules Are Affecting Global Warming*, CARBON BRIEF (July 3, 2023), <https://perma.cc/A7ML-PJ9P>. But these effects are far too weak to impede significant global warming. They have not stopped global temperatures from rising 1.1°C thus far, much less “offset” warming or caused “cooling.”

161. Supran & Oreskes, *supra* note 11, at 8.

of climate change” exist.¹⁶² Rather than “ced[ing] the science”¹⁶³ and fighting climate regulation with economic arguments, the plan argued that it would be more effective to sow doubt over whether climate change was happening at all and, if so, whether humans “really have any influence on it.”¹⁶⁴ Both strategies quickly became major elements of the FFCs’ playbook of doubt and denial.¹⁶⁵

Because no reputable researchers would agree with the disinformation campaign, FFCs funded a network of third-party individuals and organizations that sowed doubt about climate change.¹⁶⁶ At least 40 groups, including some of the same people and organizations the tobacco industry funded to mislead the public about the health harms of smoking, were employed to drum up uncertainty and doubt about the catastrophic risks the industry produces.¹⁶⁷ FFCs invested heavily in advocacy groups,¹⁶⁸ lawsuits on behalf of other parties,¹⁶⁹ and even entire news organizations to promote messages contradicting the sound climate science they both produced and consumed.¹⁷⁰ Exxon claimed to stop supporting groups that promote climate denial in 2008 but in fact continued to do so,¹⁷¹ as well as continued casting doubt on climate science in public communications of its own.¹⁷²

162. Memorandum from Joe Walker to Global Climate Science Team, Am. Petroleum Inst., on Global Climate Science Communications Action Plan 3 (Apr. 3, 1998) (on file with ClimateFiles).

163. *Id.* At 2 (describing the “action plan” to persuade the public that “science does not support” the mitigations proposed in the Kyoto Accord).

164. *Id.* at 1.

165. See Chris Mooney, *Some Like It Hot*, MOTHER JONES (May/June 2005), <https://perma.cc/MY4K-YVFB>.

166. *Id.*

167. *Put a Tiger in your Think Tank*, MOTHER JONES, <https://perma.cc/46K3-MNCZ>; See *id.*; see generally NAOMI ORESKES & ERIK M. CONWAY, *MERCHANTS OF DOUBT: HOW A HANDFUL OF SCIENTISTS OBSCURED THE TRUTH ON ISSUES FROM TOBACCO SMOKE TO GLOBAL WARMING* (2010). The company also continued funding some of these groups for years after it publicly claimed it had stopped. David Adam, *ExxonMobil Continuing to Fund Climate Sceptic Groups, Records Show*, *THE GUARDIAN* (Jul. 1, 2009), <https://perma.cc/DP8K-3WPJ>.

168. *Put a Tiger in your Think Tank*, *supra* note 167; see David Gelles, *The Texas Group Waging a National Crusade Against Climate Action*, *N. Y. TIMES* (Dec. 4, 2022), <https://perma.cc/38BT-Y772> (detailing activities of the Texas Public Policy Foundation, funded in substantial part by FFCs).

169. Gelles, *supra* note 168 (describing the Texas Public Policy Foundation as “bankrolling” lawsuits designed to support fossil fuels, including one “to block the nation’s first major offshore wind farm off the Massachusetts coast”).

170. Hiroko Tabuchi, *How One Firm Drove Influence Campaigns Nationwide for Big Oil*, *N.Y. TIMES* (Nov. 11, 2020), <https://perma.cc/4U3N-K3QG> (“[f]ormer employees familiar with Energy In Depth said the site’s content had direction from Exxon Mobil, one of the major clients of the FTI division that worked on these oil and gas campaigns.”).

171. *Exxon’s Climate Denial History: A Timeline*, GREENPEACE, <https://perma.cc/2EMX-B4J9>; see Matthews & Eaton, *supra* note 111.

172. *Supran et. Oreskes, supra* note 11, at 5.

Some FFCs now claim to support climate solutions.¹⁷³ But not a single FFC has changed its business in a manner aligned with keeping the planet safe for humans. Nor has any agreed to halt new exploration for fossil fuels, arguably the starting point for any serious response to climate change given the scientific consensus that known oil reserves, alone, would push the Earth over 1.5°C of warming without the use of any new sources.¹⁷⁴ No less revealing of the nature of their interest in solutions, major oil companies have made modest climate commitments when oil prices were slumping, then backed off those promises when the price of oil recovered and their profits skyrocketed again.¹⁷⁵

Indeed, none has taken any meaningful action to help enact solutions. Instead, they aggressively tout their minimal efforts,¹⁷⁶ and promote and rely heavily on purported solutions such as carbon offsets that are, in fact,

173. For example, the American Petroleum Institute announced its support of carbon pricing in March 2021. Steven Mufson & Joshua Partlow, *Oil, Gas Industry Says It Will Support Carbon Pricing*, WASH. POST (Mar. 25, 2021), <https://perma.cc/B8VN-942Y>.

174. Only one oil major, BP, has announced even a *partial* end to exploration. David Roberts, *On Climate Change, Oil and Gas Companies Have a Long Way to Go*, VOX (Sept. 25, 2020), <https://perma.cc/858S-4PSL>; DAVID TONG, BIG OIL REALITY CHECK – ASSESSING OIL AND GAS COMPANY CLIMATE PLANS 1–2 (2020); Emily Pontecorvo, *Exxon’s ‘Emission Reduction Plan’ Doesn’t Call for Reducing Exxon’s Emissions*, GRIST (Dec. 15, 2020), <https://perma.cc/HA5D-88FR>; @see Nicholas Kusnetz, *What’s Behind Big Oil’s Promises of Emissions Cuts? Lots of Wiggle Room.*, INSIDE CLIMATE NEWS (Dec. 30, 2020), <https://perma.cc/G4NW-HLG3>; Justine Calma, *The Most Ambitious Climate Pledges from Big Oil Are Still Weak*, THE VERGE (Feb. 28, 2020), <https://perma.cc/ZKQ2-MPFS>.

175. See, e.g., Kate Yoder, *Why Are BP, Shell, and Exxon Suddenly Backing off Their Climate Promises?*, GRIST (Feb. 16, 2023), <https://perma.cc/G485-LKJV>; Dharna Noor, *Big Oil Quietly Walks Back on Climate Pledges as Global Heat Records Tumble*, THE GUARDIAN (July 16, 2023), <https://perma.cc/AG96-HZ2A>.

176. See, e.g., Complaint ¶ 112, District of Columbia v. Exxon Mobil Corp., No. 1:20-CV-01932, 2022 WL 16901988 (D.D.C. Nov. 12, 2022). (“Exxon’s advertisements promoting its investments in ‘sustainable and environmentally friendly’ energy sources further fail to mention that the company’s investment in alternative energy is minuscule compared to its ongoing ‘business as usual’ ramp up in global fossil fuel exploration, development, and production activities. From 2010 to 2018, Exxon spent only 0.2% of its capital expenditures on low-carbon energy systems, with nearly the totality of its spending (99.8%) focused on maintaining and expanding fossil fuel production. The company has simultaneously invested billions of dollars into development of Canadian tar sands projects, some of the most carbon intensive oil extraction projects in the world.”); Complaint, Muns. of Puerto Rico v. Exxon Mobil Corp. et al., 3:22-cv-01550 (D.P.R. 2022) (suing for damages related to FFCs’ fraud, racketeering, and anti-competitive practices).

A Shell ad campaign was rejected by a Dutch advertising watchdog over misleading claims that customers can offset emissions from the gasoline they use. Laura Hurst & Diederik Baazil, *Dutch Ad Watchdog Tells Shell to Pull ‘Carbon Neutral’ Campaign*, BLOOMBERG (Aug. 27, 2021), <https://perma.cc/BC3N-ED49>; Diederik Baazil & Cagan Koc, *Shell Loses Dutch Appeal Over Misleading Carbon Emission Ads*, BLOOMBERG (Oct. 21, 2022), <https://perma.cc/RQ45-G8KB>. And in June 2023, the United Kingdom banned a Shell advertising campaign for misleadingly giving the impression that low-carbon energy was a significant proportion of the company’s business. See Ed Davey, *Shell’s Clean Energy*

“worthless,”¹⁷⁷ or carbon capture and storage, which is known to be economically infeasible and has largely been used to *boost* oil production.¹⁷⁸ Aside from lacking promise to mitigate climate change, particularly on the timeline necessary to avoid more catastrophic climate outcomes, the most notable features of these methods are that FFCs have used them to justify the continued use of fossil fuels and have even won significant government subsidies for them.¹⁷⁹ Internal documents disclosed to the U.S. House Committee on Oversight and Reform suggest that these types of “self-interested benefits” are precisely the point.¹⁸⁰

At the same time, FFCs have continued to oppose and undermine efforts to implement real solutions,¹⁸¹ including those they claim to endorse and

Advertising Campaign Is Misleading, UK Watchdog Says, ASSOCIATED PRESS (June 7, 2023), <https://perma.cc/4RY2-LUAG>.

177. Nina Lakhani, *‘Worthless’: Chevron’s Carbon Offsets Are Mostly Junk and Some May Harm*, *Research Says*, THE GUARDIAN (May 24, 2023), <https://perma.cc/DYN9-UCNL>; Timothy Gardner et al., *Clean crude? Oil firms use offsets to claim green barrels*, REUTERS (Apr. 16, 2021), <https://perma.cc/25FM-85WZ>.

- A series of studies and exposes has exposed nearly all voluntary carbon markets as riddled with transparency and integrity problems, and in many cases outright fraud. *See generally* BARBARA K. HAYA ET AL., *QUALITY ASSESSMENT OF REDD+ CARBON CREDIT PROJECTS* (2023), <https://perma.cc/H89F-JNLH>; Julia P. G. Jones & Simon L. Lewis, *Forest Carbon Offsets Are Failing*, 381 *SCI.* 830, 830–831 (Aug. 2023); Patrick Greenfield, *Revealed: More Than 90% of Rainforest Carbon Offsets by Biggest Certifier Are Worthless*, *Analysis Shows*, THE GUARDIAN (Jan. 18, 2023), <https://perma.cc/28RQ-MDYV>; *see* Barbara K. Haya et al., *Comprehensive Review of Carbon Quantification by Improved Forest Management Offset Protocols*, 6 *FRONT. FOR. GLOB. CHANGE*, Mar. 2023, at 2; For good overviews, *see Last Week Tonight with John Oliver* (HBO television broadcast Aug 21, 2022); David Roberts, *Voluntary Carbon Offsets Are Headed for a Crash*, VOLTS (Aug. 4, 2023), <https://perma.cc/LG6C-6NZJ>.
178. *See, e.g.*, Charles Harvey & Kurt House, *Every Dollar Spent on This Climate Technology Is a Waste*, N.Y. TIMES (Aug. 16, 2022), <https://perma.cc/GRM6-654V> (“Where C.C.S. has been most widely used in the United States and elsewhere . . . is in the production of oil and natural gas.”); Bruce Robertson & Milad Mousavian, *Carbon Capture to Serve Enhanced Oil Recovery: Overpromise and Underperformance*, INST. FOR ENERGY ECON. & FIN. ANALYSIS (Mar. 1, 2022), <https://perma.cc/SB57-VBLH>; David Roberts, *Could Squeezing More Oil out of the Ground Help Fight Climate Change?*, VOX (Dec. 9 2019), <https://perma.cc/6UYU-RUFP> (noting that “enhanced oil recovery” is not just “the largest industrial use of CO₂” but “the only industrial use of CO₂ that has reached appreciable scale”).
179. *See, e.g.*, Amy Westervelt, *Subpoenaed Fossil Fuel Documents Reveal an Industry Stuck in the Past*, THE INTERCEPT (Dec. 24, 2022), <https://perma.cc/V9BY-KL6A>; Dana Drugmand, *Big Oil’s Been Secretly Validating Critics’ Concerns about Carbon Capture*, DESMOG (Feb. 13, 2023), <https://perma.cc/TPR8-LEHR>.
180. Memorandum from the U.S. H. Comm. on Oversight & Reform 15 (Dec. 9, 2022), <https://perma.cc/UP2B-3G35>; *see also* Drugmand, *supra* note 179; Westervelt, *supra* note 179.
181. FFCs, like big tobacco, have attempted to lay climate change at the feet of individual consumer choice while at the same time challenging climate science. Geoffrey Supran & Naomi Oreskes, *Rhetoric and Frame Analysis of ExxonMobil’s Climate Change*, 4 ONE EARTH 696, 696 (2021) (finding that ExxonMobil “used rhetoric of climate ‘risk’ and consumer energy ‘demand’ to construct a ‘Fossil Fuel Savior’ (FFS) frame that downplays the reality and

support in the abstract, by overwhelmingly supporting politicians who oppose all climate solutions and opposing nearly if not all efforts to enact meaningful climate policies.¹⁸² According to a former lobbyist caught on video discussing FFC policy tactics, FFCs have also continued to aggressively fight climate science through “shadow groups.”¹⁸³ FFCs continue engaging in greenwashing campaigns so aggressive that they are now being sued in multiple states for fraud and racketeering related to the campaign of false statements they have undertaken.¹⁸⁴

E. Factual Summary

Scientists believe we are perilously close to—or perhaps beyond—triggering tipping points that would inexorably drive cataclysmic warming, resulting in Earth systems that could kill millions or even billions of humans.¹⁸⁵ In other words, if certain tipping points have not been crossed yet, then any additional unit of carbon dioxide or methane emitted could be the one that triggers them. Yet FFCs, some of the world’s most sophisticated, expert parties regarding the science of climate change and other health harms from fossil fuel combustion, continue producing, marketing, and selling fossil fuels with abandon. In this manner, they are arguably engaged in the equivalent of a massively profitable, global game of Russian Poker—a game in which one places a bullet in the cylinder of a revolver, spins it once, then pulls the trigger repeatedly without spinning the chamber again—with the gun aimed at humanity.¹⁸⁶

seriousness of climate change, normalizes fossil fuel lock-in, and individualizes responsibility”); Amy Westervelt, *Big Oil Is Trying to Make Climate Change Your Problem to Solve. Don't Let Them*, ROLLING STONE (May 14, 2021), <https://perma.cc/632E-GYJ4>.

182. See Nichola Groom, *Big Oil Outspends Billionaires in Washington State Carbon Tax Fight*, REUTERS (Oct. 31, 2018), <https://perma.cc/Z8DF-CUCN>; Dharna Noor, *Big Oil Quietly Walks Back On Climate Pledges As Global Heat Records Tumble*, THE GUARDIAN (July 16, 2023), <https://perma.cc/AG96-HZ2A> (“No matter what strategy they employ at any given time, the industry has ‘done everything they can to block climate action and keep us dependent on their products,’ said Oreskes.”).
183. Hiroko Tabuchi, *In Video, Exxon Lobbyist Describes Efforts to Undercut Climate Action*, N.Y. TIMES (June 30, 2021), <https://perma.cc/D2G2-M2CY>.
184. See Aaron Katersky, *Exxon Mobil Must Face Environmental Allegations, Court Rules*, ABC NEWS (May 24, 2022), <https://perma.cc/95J9-F739>; see also Municipal and State Cases, *supra* note 7.
185. See William J. Ripple et al., *World Scientists’ Warning of a Climate Emergency 2021*, 71 BIOSCIENCE 894, 894 (2021) (“There is . . . mounting evidence that we are nearing or have already crossed tipping points associated with critical parts of the Earth system, including the West Antarctic and Greenland ice sheets, warm-water coral reefs, and the Amazon rainforest.”); Kemp et al., *supra* note 14, at 131; Steffen et al., *supra* note 19 (“[A] cascade of feedbacks could push the Earth System irreversibly onto a ‘Hothouse Earth’ pathway.”).
186. See *infra* note 246 and accompanying text, discussing *Commonwealth v. Malone* and the mental state necessary to support a murder charge. 47 A.2d 445, 447 (1946).

FFCs also continue to mislead and deceive the public about the relationship between their conduct and the escalating harms through major public “green-washing” campaigns.¹⁸⁷ We will not know for decades precisely how lethal the effects of FFCs’ conduct will end up being. However, there is now overwhelming evidence that the catastrophic risks FFCs foresaw their conduct generating have materialized, killing at least scores of Americans every year. We also now have extensive evidence that FFCs were not only aware of the catastrophic risks associated with their conduct, but that they also sought to confuse and mislead rather than inform the public of these risks, thereby compounding the lethal harms they generated. In sum, the following facts support a prosecution of FFCs for homicide:

1. FFCs’ extraction, processing, marketing, and use of fossil fuels significantly contributed to climate change in ways that have significantly accelerated or contributed to many deaths.
2. FFCs were aware of research, including their own, accurately projecting that their practices would lead to “globally catastrophic” changes in the Earth’s climate, and
3. that these changes included lethal risks related to flooding, drought, heat exposure, smog, and other harms.
4. When confronted with evidence that their practices would cause catastrophic harms, including reasonably foreseeable deaths, FFCs neither curtailed their practices nor took other remedial action such as informing the public or policymakers of the danger, or even privately initiating serious efforts to transition slowly to a less lethal business model.
5. After learning that their practices would produce catastrophic harms, including reasonably foreseeable deaths, FFCs worked to mislead shareholders, the public, and policymakers in order to prevent the curtailing of their dangerous but profitable practices.

Evidence exists in the public record to support each of these facts. Fully understanding their relevance, however, requires a discussion of the legal doctrine, to which we now turn.

III. FFCs’ CONDUCT MEETS DOCTRINAL REQUIREMENTS FOR SEVERAL FORMS OF HOMICIDE

The core of homicide doctrine is straightforward: if a person or corporation contributes to or accelerates any number of deaths, by one or more acts undertaken with one of the necessary culpable mental states, they may be held liable

187. See Geoffrey Supran & Cameron Hickey, *Three Shades of Green(washing): Content Analysis of Social Media Discourse by European Oil, Car, and Airline Companies* (Algorithmic Transparency Inst. & Harvard Univ., Working Paper, 2022), <https://perma.cc/6DGK-ULYG>.

for some grade of criminal homicide. Because death is such an extreme harm, many states are willing to punish actors who are merely negligent in generating lethal risks. Several variations or elaborations on the doctrine discussed below exist, but the key features are similar. When considering the doctrine, it is helpful to keep in mind fundamental life-protecting motivation that animates it and the moral impermissibility of a killing even through omissions or negligence. Below, this section outlines a case for finding major FFCs culpable of negligent homicide at the least, and possibly the more serious crimes of manslaughter or murder.

A. Criminal Act Requirements

The core requirement of any crime is an act by the defendant. For many so-called “conduct offenses” like perjury or rape, the specified act itself is sufficiently wrongful or dangerous that a prosecution need not show that any harm resulted from the action; it is enough merely to prove that the defendant committed the act.¹⁸⁸ Conversely, for so-called “result offenses” like murder or manslaughter, the result is sufficiently undesirable and the possible causes so diverse that any conduct can satisfy the act element, so long as it was undertaken with a sufficiently culpable mental state and was a cause of the forbidden result.¹⁸⁹ Homicide, in all its forms, follows this latter pattern. The core act is some variant on *causing the death of a person*.¹⁹⁰

FFCs’ conduct includes not only the extraction, marketing, and selling of products that would so alter the climate that death would result, but also the development and purveying of disinformation designed to prevent both regulation and informed consumer choices that could mitigate climate harms and reduce the number of resulting deaths. The various marketing and disinformation campaigns pursued by FFCs may also violate less serious civil and criminal laws, and a growing number of cases related to the FFCs’ failure to report risk and their campaigns to mislead others are either pending or in development. As we will describe below, some of these cases could have important implications for some forms of homicide liability.

B. Causation

Perhaps the most significant burden for a prosecution related to the act element of homicide will be proving that the specific conduct of the FFCs was a legal cause of any particular death that followed. The law regarding causation

188. Markus D. Dubber, *Criminal Conduct*, in AN INTRODUCTION TO THE MODEL PENAL CODE 37, 101–02, 127 (Markus D. Dubber ed., 2d ed. 2015).

189. *Id.* at 37–38, 94–95, 101.

190. Felony murder and misdemeanor manslaughter do require additional acts, but they are used to infer culpable mental state.

varies across jurisdictions, with some employing older common law formulations and others more modern formulations based on the Model Penal Code.¹⁹¹ But in every jurisdiction, the doctrine is meant to reflect common sense reasoning by ordinary people.¹⁹² The doctrine and all of its nuances are meant to capture an ordinary sense of when we may justly hold defendants accountable for harms they cause.¹⁹³ Therefore, the doctrinal rules of thumb that courts employ should be interpreted in light of how ordinary people think about causation and culpability and—regarding climate homicide—whether FFCs have engaged in actions that hastened or contributed to death through some chain of events that they contemplated or should have contemplated.

1. Causation in Common Law Jurisdictions

Under the common law formulation, causation doctrine requires the prosecution to prove both (1) that the result would not have occurred but for the defendant's conduct; and (2) that the result was a reasonably foreseeable consequence of the defendant's conduct.

a. FFC actions were a "but-for" or "in-fact" cause of death

But for FFCs' extraction, production, marketing, and sale of fossil fuels, the use of which would emit over half a trillion tons of heat-trapping compounds into the atmosphere, climate change and the deaths linked to it would be less catastrophic in scope.

The argument here describes a chain of causation, several links of which the FFCs had control over. First, FFCs largely control the production, marketing, and sales of fossil fuels, the product generating the catastrophic lethal risks in question.¹⁹⁴ Second, when FFCs marketed and sold the fuels they extracted, they failed to convey important information they had about the catastrophic dangers associated with the use of fossil fuels to consumers, shareholders, competitors, regulators, and legislators. An omission, such as a failure to disclose a known risk where one has a legal duty to do so, can count as a causal act.¹⁹⁵

191. Compare, e.g., California Jury Instructions - Criminal, "CALJIC No. 3.40 - Natural and Probable Consequences Doctrine" (5th ed. 2021), with ALA. CODE § 13a-2-5 (1975); DEL. CODE ANN. tit. 11, § 263 (1995); HAW. REV. STAT. § 702-216 (1984); MONT. CODE ANN. § 45-2-201 (1973); N.J. REV. STAT. § 2C:2-3 (2013); 18 PA. CONS. STAT. § 303 (2003).

192. For a recent overview of the literature on causation, see generally Mark D. Alicke et al., *Causal Conceptions in Social Explanation and Moral Evaluation: A Historical Tour*, 10 PERSPS. ON PSYCH. SCI. 790 (2015).

193. See generally H.L.A. HART & TONY HONORÉ, CAUSATION IN THE LAW (2d ed. 1985); MICHAEL S. MOORE, CAUSATION AND RESPONSIBILITY: AN ESSAY IN LAW, MORALS, AND METAPHYSICS (2009).

194. Tess Riley, *Just 100 Companies Responsible for 71% of Global Emissions, Study Says*, THE GUARDIAN (Jul. 10, 2017), <https://perma.cc/T4MB-3ZSD>.

195. See generally Graham Hughes, *Criminal Omissions*, 67 YALE L.J. 590 (1957).

And there is a case to be made that FFCs have gone well beyond omission by engaging in an active campaign of disinformation and lobbying to prevent other parties—including consumers, shareholders, competitors, regulators, and legislators—from understanding or acting to reduce the risks associated with fossil fuel consumption, and that this deception has had lethal consequences.

Any one of these links could be argued as necessary to generate the risks associated with the current climate crisis, but in combination they have a cumulatively greater likelihood of satisfying the “but for” prong of causation doctrine employed by most courts of common law.¹⁹⁶

Any individual FFC might argue that no single FFC’s actions are a “but for” cause of any particular death because many FFCs produced and sold fossil fuels. An FFC might argue that, even without its own production, sale, and marketing of fossil fuels, and without its contributions to the campaign of disinformation designed to convince consumers, shareholders, regulators, and legislators, climate change still would have occurred because other companies would have engaged in the same behavior. Another related argument might be that, had FFCs alerted the public and curbed their lethal conduct, economic activity would have shifted to other greenhouse-gas-emitting fuels such as wood.

These arguments misapprehend how the “but for” cause requirement functions in most jurisdictions. Most courts of common law hold, just as most people believe in ordinary life, that where a defendant’s conduct has either *accelerated* or *contributed to* a death, the conduct satisfies this prong and is an “in-fact” cause of death.¹⁹⁷ Thus, it is no defense to say that many other people also contributed to the forbidden harm.¹⁹⁸ There are many criminal cases in which multiple actors, sometimes even the victims themselves, are substantial contributors to the death in question, but where the defendant who also contributed to the

196. See generally Michael Moore, *Causation in the Law: 2.2 The Dominant Definition of Cause-in-Fact*, in STAN. ENCYC. OF PHIL. (2019), <https://perma.cc/W22T-7UBE>. (describing this requirement as posing the counterfactual question: “but for the defendant’s action, would the victim have been harmed as she was?”). There has been some confusion about causation doctrine in federal courts; see generally Eric A. Johnson, *Cause-in-Fact after Burrage v. United States*, 68 FLA. L. REV. 1727 (2016).

197. *People v. Phillips*, 414 P.2d 353, 358 (Cal. 1966), *overruled on other grounds by* *People v. Flood*, 957 P.2d 869 (Cal. 1998) (“Murder is never more than the shortening of life; if a defendant’s culpable act has significantly decreased the span of a human life, the law will not hear him say that his victim would thereafter have died in any event.”); JOSHUA DRESSLER, *UNDERSTANDING CRIMINAL LAW* 186 (7th ed. 2015) (“It must be remembered that this test asks whether, but for the voluntary act of the defendant, the harm would have occurred *when it did*.”).

198. See Note, *Causation in Environmental Law: Lessons from Toxic Torts*, 128 HARV. L. REV. 2256, 2260 (2015) (noting the iniquity of any standard that held “the injured party cannot obtain a remedy from any of the actors simply because each of them could point at the others to prevent any showing of causation”).

harm is not excused.¹⁹⁹ Similarly, it is no defense to argue that someone else might have engaged in similarly lethal conduct had the defendant not done so. Finally, there is no doctrinal bar to prosecution where there is uncertainty about which particular death a defendant caused, so long as the defendant engaged in related conduct that a reasonable person would understand to be generating lethal risk.²⁰⁰

b. Death was a reasonably foreseeable consequence of FFCs' actions

The second causation prong in common law jurisdictions requires that the result be within the scope of some risk of which the defendant was aware or should have been aware. Although this prong is typically thought to be the more difficult of the two, in this instance it may not be. The research and internal reports of the FFCs laying out the risk of “globally catastrophic” climate change related to the use of their products shows that they were aware of the scope of risk. On its face, FFC awareness of fossil fuels generating climate change that would submerge the “considerable percentage of the human race [that] lives in coastal regions,”²⁰¹ satisfies this prong. As would projections that “agricultural output” would be “destroyed,”²⁰² or that heavily populated areas of the Earth would become “less habitable.”²⁰³

It is worth noting that the prosecution does not need to prove that the defendants were actually aware of the risk of death to satisfy this prong.²⁰⁴ They need only show that the defendant *should have been* aware of that risk. Even if, despite all the notice given by their own researchers and other experts, a factfinder believed FFCs were somehow unaware of the lethal risks associated

199. *See, e.g.,* Ward v. State, 233 S.E.2d 175, 177 (Ga. 1977) (holding that, even if the defendant’s act of throwing the drunken victim off a bridge into a river “did not directly cause” the victim’s death, “the jury was authorized to find that this act either materially contributed to the death . . . or materially accelerated it”); Durden v. State, 297 S.E.2d 237, 241 (Ga. 1982) (holding that a defendant’s conduct may be found to be the cause of a death where it either “materially contributed to the happening of a subsequent accruing immediate cause of the death” or “materially accelerated the death, although proximately occasioned by a pre-existing cause.”).

200. *See, e.g.,* People v. Sanchez, 26 Cal. 4th 834, 854 (2001) (holding that, in a shooting during which multiple persons fired weapons and it was not determined who fired the shot that killed a bystander, there was no bar to finding that the defendant contributed to the death by contributing to the shooting); People v. Kemp, 150 Cal. App. 2d 654, 663 (1957) (multiple potential causes of death during a drag race does not bar finding that the defendant contributed to the death by participating in the race).

201. Franta, *supra* note 11.

202. Paul Huttner, *Climate Cast: What Exxon Knew in 1977*, MPR NEWS (Sept. 24, 2015), <https://perma.cc/W262-P4KV>.

203. Memorandum from W.L. Ferrall to R.L. Hirsch on Controlling the CO₂ Concentration in the Atmosphere Appendix A (Oct. 16, 1979) (on file with ClimateFiles).

204. *See generally* Rollin M. Perkins, *Ignorance and Mistake in Criminal Law*, 88 U. PA. L. REV. 35 (1939); D. O’Connor, *Mistake and Ignorance in Criminal Cases*, 39 MOD. L. REV. 644 (1976).

with their conduct, the legal question is whether *a reasonable actor* in their position would have been aware of the risks. This standard has likely been met.

c. Responses to Potential Counterarguments

Consistent with the common-sense basis of causation doctrine, common law courts sometimes hold that an “intervening act” breaks the “chain of causation” if the end result is sufficiently removed from the defendant’s original act and the subsequent acts of third parties are sufficiently unforeseeable.²⁰⁵ Similarly, where many parties are involved in causing harm, and where the harm is less foreseeable as a result of another party’s act, courts have in some cases held that only those whose acts were foreseeably linked to the harm are responsible.²⁰⁶ FFCs might thus argue that, although they have contributed to climate change deaths, it is the actual emitters—those driving cars, heating homes, and flying airplanes—whose actions are more closely linked to climate change.

This argument is implausible. To break the chain of causation, a third-party act must be unforeseeable and sufficiently removed from the defendant’s act to absolve them of responsibility. It is unlikely that FFCs will persuade juries or judges that they were unaware their products would be used precisely as intended.

This objection fails for another reason as well. Where a party misleads or deceives another into taking some further harmful action, the deceived party is not viewed as breaking the chain of causation.²⁰⁷ As applied to climate homicide, it is doubtful the FFCs can convincingly argue that the mortal peril they generated was absolved by the public’s failure to pierce FFCs’ obfuscatory efforts. FFCs did not simply fail to alert the public about the risks they had uncovered; they engaged in a campaign to keep the public not only uninformed but misinformed about those risks. On this account, the law would view the subsequent actors contributing to the harm as “instrumentalities” of the FFCs.²⁰⁸

Further, even if the public was negligent in some respect, juries and judges alike regularly hold defendants guilty for deaths that followed the negligent acts of others, so long as the defendant’s action initiated the series of events that led

205. One reform commission recently reviewing the doctrine wrote of the many ways judges have described the term, “these statements all revolve around a basic and intuitive moral question (which is reflected in the case law): can the defendant, given all of the ‘intervening occurrences [that] may have contributed to’ producing the result for which he or she is being prosecuted, ‘in all fairness[] be held criminally responsible’ for that result?” D.C. CRIM. CODE REFORM COMM’N, RECOMMENDATIONS FOR THE COUNCIL AND MAYOR (VOTING DRAFT): COMMENTARY: SUBTITLE I. GENERAL PART 27 (2021), <https://perma.cc/Y847-GHGH>.

206. *See e.g.*, *People v. Medina*, 209 P.3d 105, 107 (Cal. 2009).

207. *See* H.L.A. HART & TONY HONORÉ, CAUSATION IN THE LAW 326 (1985).

208. To this end, prosecutors would need only show that FFCs intended for others to burn fossil fuels in a way they knew or should have known would emit sufficient greenhouse gasses to produce the catastrophic conditions likely to produce death of which our broader society is increasingly aware.

to a death. Causation doctrine thus does not absolve the initial actor where the subsequent acts are “responsive to” or “dependent on” the defendant’s act.²⁰⁹ For example, a defendant who injures someone non-fatally can be liable for homicide even if the victim dies due to negligence of a doctor treating the injury.²¹⁰ In the case of a prosecution of FFCs for homicide, far from being “disconnected” from the defendants’ conduct, the subsequent acts by others are precisely what the FFCs not only foresaw, but actively encouraged.²¹¹

Finally, it is worth emphasizing once again that terms like “intervening acts” and “innocent instrumentalities” are phrases that judges sometimes employ to explain common-sense moral reasoning. In all jurisdictions, including common law jurisdictions that have complex verbiage in their causation doctrine, the core purpose is the same: to fit the law to common moral intuitions of blameworthiness.²¹²

2. Causation in Jurisdictions with Modern Criminal Codes

Although jurisdictions with modern codes use an “in fact” test that is nearly identical to that of common law jurisdictions, their test for the “proximate” prong is distinct in important ways. The modern approach to causation, drawn from the Model Penal Code,²¹³ codifies the role of moral intuitions, simplifies the doctrine, and further empowers the jury, encouraging judicial deference to jurors’ common-sense moral reasoning.²¹⁴ The modern standard for proximate

209. WAYNE R. LAFAVE, *CRIMINAL LAW* 350–65 (W. Publ’g Co., 5th ed. 2010); ROLLIN M. PERKINS & RONALD N. BOYCE, *CRIMINAL LAW* 791–809 (The Found. Press, 3d ed. 1982); Dressler *supra* note 197, at 196.

210. Consider, for example, a rape case where subsequent negligence by hospital staff treating the victim asphyxiated her with an incorrectly placed feeding tube. As Judge Posner reasoned in that case, “every event has multiple causes;” for an act to break the chain of causation, it must be “a supervening act disconnected from any act of the defendant.” *Brackett v. Peters*, 11 F.3d 78, 79–80 (7th Cir. 1993) (quoting *People v. Meyers*, 64 N.E.2d 531, 533 (Ill. 1945); *People v. Dordies*, 377 N.E.2d 245, 249–50 (Ill. App. 1978)).

211. Larry Alexander, *Culpability*, in *OXFORD HANDBOOK OF THE PHILOSOPHY OF THE CRIMINAL MIND* 128 (John Deigh & Stuart Green eds., 2008).

212. Michael Moore, *Causation in the Criminal Law*, in *THE OXFORD HANDBOOK OF PHILOSOPHY OF CRIMINAL LAW* (John Deig & David Dolinko eds., 2011) (“[C]ausation may be known better by common intuition in particular instances than by the abstract tests legal theorists have devised to ‘guide’ such intuitions.”).

213. MODEL PENAL CODE § 2.03.

214. See Dressler, *supra* note 197, at 197 (“proximate causation factors developed by the common law are replaced with a single standard, which expressly invites the jury to reach a commonsense, or just, result.”). Courts in jurisdictions with modern codes regularly employ this approach. See *Johnson v. State*, 224 P.3d 105, 110 (Alaska 2010) (“The Model Penal Code couches the relationship between liability and unforeseen consequences in terms of culpability, not causation.”); *id.* at 111 (“As the drafters [of the Model Penal Code] rightly concluded, the need for flexibility is great. We cannot fashion a rule detailing precisely which consequences are too remote to preclude criminal liability — that will be left to the fact finder.”).

causation requires that the actual result of the defendant's conduct was not "too remote or accidental" in its occurrence to have a "just bearing" on the actor's liability or on the gravity of their offense.²¹⁵

This modern formulation dispenses with many of the doctrinal wrinkles that have perplexed both judges and commentators in common law jurisdictions, while explicitly shifting decision-making from doctrinal interpretation by the judge to the moral judgment of the factfinder.²¹⁶ Accordingly, the Model Penal Code encourages deference to the jury's common-sense determination on any question of causation.²¹⁷

These aspects of the modern approach to legal causation in criminal cases—empowering and deferring to juries and distilling the proximate cause question to their notions of justice—work in favor of FFC prosecutions. In common law jurisdictions, judges in criminal trials often rely on complex causation doctrine from tort law, which is notoriously unfavorable to claims against corporate defendants.²¹⁸ By contrast, in jurisdictions with modern criminal codes, judges in criminal trials think of causation as a common-sense matter to be

215. MODEL PENAL CODE § 2.03(3)(b).

216. The Model Penal Code does not dispense with foreseeability altogether:

[T]he Code's flexible standard does not render the traditional causation factors irrelevant. It merely transforms them from dispositive rules into guidelines for the application of a less artificial standard that exposes the underlying issue of imputation for all the world to see . . .

MARCUS D. DUBBER, AN INTRODUCTION TO THE MODEL PENAL CODE 109 (2d ed. 2015).

217. See, e.g., Hart & Honoré, *supra* note 207, at 397 ("This must be a matter for the jury to determine and the problem of 'proximate cause' on this view of the matter is essentially that of devising a clear formulation to which the jury should attend."); see also ALASKA COURT SYSTEM LEGAL RESOURCES, 1.25 *Causation*, in ALASKA CRIMINAL PATTERN JURY INSTRUCTIONS (2014).

218. The problems associated with establishing the causal link between corporate conduct and diffuse industrial harms in tort law are well known. See Danielle Conway-Jones, *Factual Causation in Toxic Tort Litigation: A Philosophical View of Proof and Certainty in Uncertain Disciplines*, 35 U. RICH. L. REV. 875, 878 (2002) ("[T]he only clear observation in toxic tort litigation is the unparalleled dilemma of establishing a cause and effect relationship between a toxin and a plaintiff's injury."); Jeff Todd, *A Fighting Stance in Environmental Justice Litigation*, 50 ENV'T L. 557, 568 (2020) ("[E]nvironmental torts do not fit the optimal tort situation of a single plaintiff showing a clear harm caused by a single, identifiable defendant."). This can have a perverse effect on standing. See *Causation in Environmental Law, Lessons from Toxic Torts*, *supra* note 198, at 2256. Moreover, even when juries in common law jurisdictions find causation with respect to environmental torts, judges often rule as a matter of law that the standard for causation has not been met. See, e.g., *Norris v. Baxter Healthcare Corp.*, 397 F.3d 878, 885–88 (10th Cir. 2005); see also Jean Macchiaroli Eggen, *Being Small in a Supersized World: Tackling the Problem of Low-Level Exposures in Toxic Tort Actions*, 44 ENV'T L. REP. 10630, 10632 (2014). Unfortunately, we think it unlikely that courts will take up Douglas Kysar's thoughtful suggestion that tort law be reformed in light of climate change. See generally Douglas A. Kysar, *What Climate Change Can Do about Tort Law*, 41 ENV'T L. 1 (2011).

decided by the jury.²¹⁹ Along with increased deference to the jury, the modern approach to causation asks jurors for a more straightforward normative, even moral judgment: in light of the defendant's knowledge and actions, is it *just* to find them culpable?

3. *Conceptual Satisfaction of the Criminal Act Element*

The review above suggests there is no major doctrinal obstacle to a finding that FFCs satisfy the criminal act element of any form of involuntary homicide, namely that their actions cause and continue to cause death. Because so much of causation doctrine rests on the moral judgment of the finder of fact, as climate change accelerates and climate deaths multiply, and as more facts emerge regarding what FFCs knew and did, the turning of the moral tide against FFCs is, with every passing season, making causation less of an obstacle than it may once have been.

We turn now to the various gradations of homicide that a prosecutor might reasonably charge, either singly or in the alternative, and affirmative defenses FFCs might raise.

C. *Culpable Mental States and Homicide Gradations*

In assessing the grade of homicide the facts might support, we make no claim that FFCs had the purpose or intent of causing the catastrophic conditions and deaths that they foresaw resulting from the production, sale, and distribution of their products; nor do we claim they have intended any harm with their misrepresentations.²²⁰ Rather, we restrict our review of homicide to unintentional forms: negligent homicide, involuntary manslaughter, misdemeanor manslaughter, so-called "depraved and malignant heart" murder, and felony murder.

1. *Negligent Homicide and Involuntary Manslaughter*

The categories of negligent homicide, manslaughter, and murder are, in nearly every jurisdiction, gradations based primarily on the defendant's mental

219. In modern code jurisdictions, judges often leave even complex causation questions to juries. Thus, in a drunk driving homicide involving the decision to drink before getting behind the wheel, followed by a collision, a victim's extensive hospitalization, partial recuperation, medical negligence, and a determination to refuse food or remove life support, the jury is the ultimate arbiter of whether the original decision to drink was a criminal cause of death. *See, e.g., State v. Pelham*, 824 A.2d 1082, 1093–94 (N.J. 2003).

220. Both harms can be thought of as side-effects of the pursuit of profits. There is an old debate over the ability of a corporate entity to commit a crime that requires criminal purpose or intent. As we are not proposing any form of intentional homicide charge here, we do not enter into this debate.

state. The underlying conduct—causing the death of another human—could be the same in every case. For unintentional killings, the key distinction is the degree of culpability demonstrated by the defendant's mental state. At the lower end of the liability spectrum is *negligent homicide*, which requires negligence, often distinguished from *manslaughter*, which requires gross negligence. The distinction between negligent homicide and involuntary manslaughter typically turns, respectively, on whether the defendant was unaware of a risk of death but should have been aware or the defendant was aware of the risk and consciously disregarded it. In both cases, the ignorance or disregard of the risk typically must constitute a “gross deviation from the standard of conduct that a reasonable person would observe in the situation.”²²¹

Let us assume for the sake of argument that a prosecutor can prove that FFCs were aware, or should have been aware, of the research they produced indicating that their actions posed a “globally catastrophic”²²² risk to human well-being, could “destroy” the agriculture of entire nations, and could render the tropics “less habitable.”²²³ In that case, the question for a jury is whether FFCs should have continued to produce, market, and sell their product—or whether they should have stopped, tapered their conduct or, at the very least, warned the public and policymakers loudly and clearly and sought solutions. If presented with the relevant facts, most if not all people would, we think, say that FFCs' mental posture amounted to more than the “should have known” standard of ordinary negligence, treading well into the territory of the “conscious disregard” of “substantial and unjustifiable risks” required for recklessness.²²⁴ And the proportion of people who hold those views seems likely to be greater in five years, and still greater in ten.

2. Misdemeanor Manslaughter

In many jurisdictions, another way to satisfy the culpable mental state requirement for manslaughter is with a predicate misdemeanor.²²⁵ So-called “misdemeanor manslaughter,” in its broadest form, is simply committing an

221. See, e.g., MODEL PENAL CODE § 2.02(2)(c); N.Y. PENAL LAW § 15.05(3) (McKinney 2014); MASS. GEN. LAWS ch. 265. Other states employ a similar definition but describe the conduct in terms of “wantonness.” See, e.g., MASS. GEN. LAWS ch. 265, § 13L; KEN. REV. STAT. § 501.020(3) (1975).

222. Memorandum from Am. Petroleum Inst., *supra* note 1.

223. Memorandum from W.L. Ferrall, *supra* note 124.

224. MODEL PENAL CODE § 210.3. Manslaughter (“Criminal homicide constitutes manslaughter when . . . it is committed recklessly”).

225. In some jurisdictions, a felony can also be a predicate for manslaughter. See, e.g., Pfister v. State, 425 P.3d 183, 188 (Alaska Ct. App. 2018) (describing Alaska's abolition of negligent homicide and the requirement of recklessness “regarding the possibility that their conduct would cause . . . death” to support manslaughter predicated on an unlisted felony).

unlawful act that causes a death.²²⁶ In some states, any misdemeanor can serve as a predicate to a manslaughter conviction, so long as death resulted from the act that constituted a misdemeanor.²²⁷ Others restrict the predicate misdemeanors to those which are *mala in se*, or inherently wrong. Still other states restrict the predicate misdemeanors to those that are “inherently dangerous.”²²⁸ Finally, most jurisdictions require the predicate misdemeanor to be within any relevant statute of limitations for that misdemeanor.

As described above, several states are suing FFCs for some form of fraud, racketeering, or anti-competitive practices.²²⁹ Any of these cases might serve as a predicate for homicide charges, and many believe that more evidence of fraud is forthcoming. As the National Whistleblower Center recently wrote, the Center anticipates that “the number of cases and defendants will increase dramatically in the near future once potential whistleblowers learn about the benefits of modern whistleblower laws and begin providing information to regulators and prosecutors about the variety of climate risk deceptions” undertaken by FFCs.²³⁰

A state might thus charge an FFC with fraud, seeking to prove that the FFC “knew forty years ago that climate change was happening, and that humans were contributing to it by burning fossil fuels,”²³¹ and that the FFCs made material “misleading omissions and misrepresentations about the systemic risks of climate change.”²³² In states that require the predicate misdemeanor be *malum in se*, the ability to use the misdemeanor as a predicate for a manslaughter charge will depend whether that state deems fraud in general, or the particular form of fraud at issue, to be *mala in se*. In cases where the law is ambiguous on this point, courts might reasonably conclude that it is *mala in se* to defraud others about whether one is endangering millions of lives.

After determining whether the misdemeanor can support a charge, the state needs to determine whether the unlawful act was a legal cause of—that is, whether it contributed to or accelerated—the death of one or more human beings, consistent with the standards described above. Given the concerted campaign to mislead regulators, shareholders, and the public about the risks

226. See Judith J. Johnson, *Why Mississippi Should Reform Its Penal Code*, 37 MISS. C.L. REV. 107, 115 (2019).

227. *Id.* (“Mississippi’s misdemeanor manslaughter rule, which is also unconstrained and could theoretically be imposed for any misdemeanor.”)

228. MATTHEW LIPPMAN, CONTEMPORARY CRIMINAL LAW: CONCEPTS, CASES, AND CONTROVERSIES 414 (2d ed. 2006); see also MODEL PENAL CODE § 210.3 cmt. at 77 (AM. L. INST. 1980).

229. See *supra* notes 7 and 187 and accompanying text.

230. JOHN KOSTYACK ET AL., NAT’L WHISTLEBLOWER CTR., EXPOSING A TICKING TIME BOMB: HOW FOSSIL FUEL INDUSTRY FRAUD IS SETTING US UP FOR A FINANCIAL IMPLOSION—AND WHAT WHISTLEBLOWERS CAN DO ABOUT IT 5–6 (2020).

231. *Id.* at 5.

232. *Id.*

associated with their product and its intended use, combined with the purpose of preventing mitigation of the catastrophic risks they are generating, the causal link between the fraud and the resulting harm of death is readily apparent.

3. "Depraved Heart" Murder

Although the best-known formulation of murder involves a perpetrator who intends to kill the victim, another commonly charged form of murder involves killings that are unintentional. Where a defendant acted "recklessly" under circumstances manifesting extreme indifference to the value of human life, even where the killing was unintentional, most states allow for a murder conviction.²³³ In common law jurisdictions, this category of murder²³⁴ goes by various names, including "second-degree," "third-degree," "depraved heart" or "abandoned and malignant heart" murder.

The general requirement for a prosecution of an unintentional form of second degree murder is that the actions of the defendant demonstrate an indifference to human life; and indifference that is meant "to embrace those cases where a person has no deliberate intent to kill or injure any particular individual."²³⁵ "The element of 'extreme indifference to human life,' by definition, does not address itself to the life of the victim, but to human life generally."²³⁶ This form of gross recklessness with respect to human life is deemed to satisfy the common-law requirement of malice.²³⁷ As the drafters of the Model Penal Code put it, engaging in an action with awareness that it presents a substantial and unjustifiable threat to human life is classed as murder because conscious disregard of such a risk "cannot be fairly distinguished in grading terms from homicides committed purposely or knowingly."²³⁸

At trial, then, a core question would be whether the FFCs were aware of a substantial and unjustifiable risk that their actions would contribute to or accelerate the death of any human.

233. MODEL PENAL CODE § 210.2.(1)(b).

234. *See e.g.*, 18 PA. CONS. STAT. § 2502 (1978).

235. *See e.g.*, King v. State, 505 So. 2d 403, 405 (Ala. Crim. App. 1987) (citing Napier v. State, 357 So. 2d 1001, 1007 (Ala. Cr. App. 1977), *rev'd on other grounds*, 357 So. 2d 1011 (Ala. 1978)).

236. *Id.* (quoting People By & Through Russel v. Dist. Ct. For Fourth Jud. Dist., 521 P.2d 1254, 1256 (Colo. 1974)).

237. *See, e.g.*, Commonwealth v. Pigg, 571 A.2d 438, 441 (Pa. Super. Ct. 1990) (quoting Commonwealth v. Drum, 58 Pa. 9, 15 (Pa. 1868)). *Pigg* also cites Commonwealth v. Young, 431 A.2d 230 (Pa. 1981) for the proposition that "malice is one of the essential elements of third-degree murder and is the distinguishing factor between murder and manslaughter," 571 A.2d at 441, and Commonwealth v. Wanamaker, 444 A.2d 1176 (Pa. Super. Ct. 1982), for the proposition that "malice may be found where the defendant 'consciously disregard[s] an unjustified and extremely high risk that his actions might cause serious bodily injury.'" *Id.*

238. MODEL PENAL CODE AND COMMENTARIES § 210.2 cmt. 4 (AM. L. INST. 1980).

a. Awareness of the Risk

As discussed above, there appears to be substantial evidence that FFCs have been aware for decades that their actions pose a risk to an extraordinary number of human lives. The question that would raise the potential crime from negligent homicide or involuntary manslaughter to murder is whether that risk to human life was so substantial and unjustifiable that acting in disregard of the risk warrants a murder conviction.

b. Nature and Degree of Risk Required for Murder

We cannot predict a factfinder's answer, but we can consider how the case might be argued. Gradations relating to homicide based on a defendant's mental state are often glossed as a single question about where on a scale of culpability the defendant's mental state falls: unreasonable ignorance of the risk, conscious disregard of the risk, or actual knowledge of the risk. But there is also a question whether the risk is substantial and unjustifiable in the particular context the defendant inhabited.

The Model Penal Code, which most states now reference or employ when assessing mental states, succinctly describes the second prong of the mental state question for recklessness as follows:

The risk must be of such a nature and degree that, considering the nature and purpose of the actor's conduct and the circumstances known to him, its disregard involves a gross deviation from the standard of conduct that a law-abiding person would observe in the actor's situation.²³⁹

The harm must be significant enough that a normal law-abiding actor would not, respectively, fail to perceive it or, if aware of it, disregard it.

Some jurisdictions that recognize depraved heart murder require consideration of more detailed factors, typically the probability that the conduct in question will cause death, the subjective appreciation of the risk, or some base anti-social purpose or motive.

For example, the Utah Supreme Court defines "depraved indifference" as "an utter callousness toward the value of human life and a complete and total indifference as to whether one's conduct will create the requisite risk of death of another."²⁴⁰ In Alabama, courts have found that a person is guilty of depraved indifference when they "act[] with a 'don't give a damn attitude,' in total disregard of the public safety."²⁴¹

But even people who arguably were fundamentally mistaken about the risks involved have been found to have met the standard of culpable disregard

239. MODEL PENAL CODE § 2.02(c).

240. *State v. Standiford*, 769 P.2d 254, 262 (Utah 1988).

241. *King v. State*, 505 So. 2d 403, 408 (Ala. Crim. App. 1987).

of something they mistakenly thought impossible. Consider the case of James Malone, a young man who wanted to impress his friend by playing “Russian Poker”: he placed a bullet in what he believed to be the very last chamber that might be fired and did not spin the cylinder. When the gun, to his evident horror, discharged and killed his friend, he was convicted of second degree murder.²⁴² No one sat down with the young man to explain, in detailed scientific reports, that people, especially young people, often make dangerous mistakes, or that accidental deaths are a predictable outcome of gunplay. He was not a sophisticated actor consulting and then rejecting the scientific literature beforehand; he simply made a mistake.

To say that the nature and degree of the “globally catastrophic” risk involved in transforming the Earth’s climate satisfies these requirements is a gross understatement. It is difficult to imagine jurors concluding that an ordinary, law-abiding citizen would risk submerging the coastal cities of the world, turning a significant proportion of the Earth’s fertile farmland into deserts, exposing large swaths of humanity to heat waves so intense that a human body at rest cannot survive, or countless other climate-related horrors that have already killed many people and will likely kill millions, possibly billions more.

It is rare to have a case in which there is such a wealth of scientific research alerting sophisticated parties to the risk to human life, and even rarer for there to be so extensive a disinformation campaign designed to confuse regulators, legislators, shareholders, and members of the public. While it is impossible to predict whether jurors would reach the conclusion that FFCs acted with extreme indifference to human life, nothing bars them from doing so. In sum, assuming there is convincing evidence that FFCs not only ignored the world-historic risks they were generating in pursuit of profit, but also covertly sought to discredit the people and data accurately describing those risks to the public, a jury might well conclude that FFCs’ conduct exhibits a depraved indifference to human life.

4. *Felony Murder*

In its broadest conception, felony murder is simply the commission of any felony that causes death.²⁴³ In most jurisdictions,²⁴⁴ however, the predicate felony must also be in some sense “dangerous.” The determination that a felony is “dangerous” varies across jurisdictions. Some jurisdictions enumerate specific

242. *Commonwealth v. Malone*, 47 A.2d 445 (Pa. 1946). Critiques of the reasoning in *Malone* are extensive, but it remains a staple in case law and classrooms as a demonstration of how juries and courts think about mental states, malice, and attention to risk.

243. *State v. Chambers*, 524 S.W.2d 826, 831(Mo. 1975) (holding that, in Missouri, the predicate felony need not be “inherently or foreseeably dangerous to human life” to support a second degree murder conviction).

244. For a survey of felony murder doctrine and its justifications, see generally Guyora Binder, *FELONY MURDER* (2012); Guyora Binder, *Making the Best of Felony Murder*, 91 B.U.L. REV. 403 (2011).

felonies that may serve as predicates to murder; others leave it to courts to determine which felonies qualify as “dangerous” and thus may serve as predicates to murder; still others look to the particular circumstances involved in each case to determine whether the defendant’s commission of the felony, in the circumstances it was committed, posed sufficient danger to qualify as a predicate to murder²⁴⁵ (for example, stealing a car may not be inherently dangerous, but stealing it from someone who is driving to a hospital for emergency treatment might qualify).

Where not cabined by statute or case law, the felony murder rule has supported murder convictions that demonstrate the exceptional breadth of the law.²⁴⁶ For argument’s sake, let us say that prosecutors prove that FFCs have committed the felony of fraud by misleading consumers, shareholders, regulators, or legislators regarding information they had about the harms their product would produce, including the transformation of the global climate and the potential for mass mortality resulting from it.

No jurisdiction statutorily enumerates fraud as a predicate to murder, and no jurisdiction has found fraud to be dangerous “on the elements” of the offense. But several states look to the circumstances of the case to determine dangerousness.²⁴⁷ In doing so, the jury determines if the specific context supports a finding that the predicate felony was sufficiently dangerous, supporting a felony murder conviction.²⁴⁸ For reasons similar to those discussed above regarding jury determinations, it is not difficult to imagine jurors concluding that the requirement of danger is met in the case of a felonious fraud carried out to assist in selling products that pose global risks to humanity.

Finally, there are still jurisdictions that do not require the predicate felony to be inherently or foreseeably dangerous. As courts in Missouri have noted, neither the statute setting out the definition of second-degree murder²⁴⁹ nor the case law under which murder convictions have been upheld in that state require the underlying felony to be “inherently” dangerous.²⁵⁰ Under this standard, *any* felony that causes death can serve as the basis of a felony murder conviction so

245. See Binder, *supra* note 244, at 419–20.

246. See *supra* Part I.C.

247. Alabama, Delaware, Georgia, Maryland, Montana, North Carolina, Oklahoma, Rhode Island, South Carolina, Texas, and Virginia. Binder, *supra* note 244, at 466 n.366. Several states have adopted this approach, and in doing so they leave it to a jury to determine whether the specific context in which the defendant committed the felony supports a finding that the predicate felony was sufficiently dangerous to support a felony murder conviction. See, e.g., *Hulme v. State*, 544 S.E.2d 138, 139 (Ga. 2001) (woman providing friend with methadone guilty of murder when friend overdosed).

248. See, e.g., *Malaske v. State*, 89 P.3d 1116, 1117 (Okla. Crim. App. 2004) (man who purchased vodka for sister guilty of murder when sister’s friend died of alcohol poisoning).

249. MO. REV. STAT. § 565.021 (2005).

250. *State v. Brown*, Missouri, No. SD37348, 2023 WL 8594462 (holding that “determine if the underlying felony ‘set into motion the chain of events’ that caused the death”) (citing *State v. Burrage*, 465 S.W.3d 77, 80 (Mo. App. 2019); see also Binder *supra* note 244 at 479–82

long as death is a foreseeable risk of the felony. It seems plausible to us that a jury would find that conduct executives foresaw as “likely” to produce “globally catastrophic” risks meets this standard.²⁵¹

IV. POTENTIAL AFFIRMATIVE DEFENSES

FFCs already raise many objections to civil and regulatory actions, and those objections could be reframed in terms of affirmative defenses to a criminal prosecution. It is useful to explore potential defenses both as a practical matter and as a more thorough exploration of how the criminal law considers the kind of conduct that FFCs are undertaking.

A. Necessity Is Not a Defense

FFCs have argued that, although they were aware of the risks associated with their product, they believed that greater harms associated with poverty would flow from further regulating fossil fuels.²⁵² Although this argument has not yet been raised in the context of homicide prosecution, this kind of claim amounts to a form of “necessity” defense to a criminal charge. Although commentators have found it “exceedingly difficult to determine the standing and scope of the defense in any particular jurisdiction,”²⁵³ the basic contours are well established. The doctrine of necessity is essentially an escape valve for criminal statutes that may be overinclusive, allowing a person who, through no fault of their own, is faced with a choice between two evils and chooses the lesser. The affirmative defense of necessity would thus be something like: fossil fuels may contribute to catastrophic risks including death, but fossil fuel production and consumption are necessary to avoid the greater risks associated with poverty that would result from reduced production and sales of fossil fuels.

In most states that allow the defense, the law typically requires that (1) the choice the defendant faced was “clear” and “imminent”; (2) the defendant reasonably believed that their actions were necessary to avoid the harm they chose to avoid; (3) there was no effective legal remedy for the harm they avoided; (4) the harm chosen was less serious than that avoided; (5) it is not anticipated by the law or regulation; (6) the defendant may not have substantially contributed to the evil they seek to avoid; and (7) the charged crime is not some form

251. *Supra* note 1; *Infra* Part II.C.

252. FFCs have funded this messaging through various organizations such as the Center for Industrial Progress, a “for profit” think tank that promotes the idea that fossil fuels improve and save lives. The CIP is not required to disclose funding, but its founder, Alex Epstein, has admitted to accepting money from fossil fuel companies to promote this message. *See, e.g.*, ALEX EPSTEIN, *THE MORAL CASE FOR FOSSIL FUELS* 206 (2014),

253. Dressler, *supra* note 197, at 289.

of homicide.²⁵⁴ Under this framework, the defense fails for multiple reasons, including that it is barred outright in homicide cases. Even if it were allowed, the FFCs' choice was not "imminent" in the sense contemplated by the criminal law; legal remedies were available; and the choice was of their own making, as FFCs contributed to at least one of the catastrophic evils they say they must choose between.

Those familiar with the Model Penal Code might wonder whether the more flexible version of the defense it employs might be available to FFCs. Under the Model Penal Code formulation, there is no restriction barring the use of the defense in homicide cases, there is an exception to the bar on self-created harms, and there is no requirement that legal remedies be unavailable to avoid the harm. Further, in jurisdictions with these provisions, the Code's clear intent is to be deferential to jurors, "who give voice to the moral standards of the community, [because it is they who] should make the normative decision about whether the evils the defendant sought to avoid were worse than those the criminal law sought to prevent."²⁵⁵ Perhaps, on this account, FFCs might hope that at least some jurors would agree with the choice FFCs claim they faced and made, viewing catastrophic climate risks as the lesser of the two evils.

This argument won't serve FFCs well. Although many states have adopted the Model Penal Code's conception of causation as a flexible standard for juries to consider, the same cannot be said about the Code's conception of the necessity defense. As Michael Hoffheimer wrote in a review of state doctrine, "a half-century after it was first proposed, the federal government and a majority of states have flatly refused to codify any form of the necessity defense."²⁵⁶ Of nineteen states that have codified the defense, "[s]eventeen . . . reject the unrestricted balancing of harms proposed by the Model Penal Code." This leaves only two states, Nebraska and Pennsylvania, that have codified the Model Penal Code's version of necessity, and in those states, courts require that the threat of greater harm be imminent or immediate.²⁵⁷ Given that informing the public of the risks of their product or gradually transitioning to less lethal alternatives would not have imminently or immediately caused poverty or any other significant harm, the defense would be unavailable to FFCs in any state.

B. *Entrapment Is Not a Defense*

FFCs may also raise objections or defenses centering on government actions related to fossil fuels, including regulation, subsidization, and related policies at the federal and state levels, arguing that these government actions

254. *Id.* at 289–91.

255. Michael H. Hoffheimer, *Codifying Necessity: Legislative Resistance to Enacting Choice-of-Evils Defenses to Criminal Liability*, 82 TUL. L. REV. 191, 228 (2007).

256. *Id.* at 242.

257. *Id.* at 234–35.

should shield FFCs' lethal conduct from prosecution. FFCs might, for example, claim that government actions induced them to produce, market, and sell fossil fuels, such that subsequent prosecution would amount to *entrapment*. The defense of entrapment builds on the intuition that law enforcement should not encourage the commission of a crime that would not otherwise have occurred in order to then prosecute that crime. In most states, entrapment requires a defendant to prove that law enforcement agents, for the purposes of future prosecution, induced them to commit a crime that they would not otherwise have committed.²⁵⁸

A claim of entrapment by FFCs fails on several fronts. First, it is implausible that law enforcement agents encouraged FFCs to engage in any form of homicide, let alone provided encouragement for the purpose of subsequent prosecution. It is also implausible that, in the absence of government enticements, FFCs would have given up the core of their business: the production, marketing, and sale of fossil fuels. Law enforcement did not encourage the extensive disinformation campaign that accompanied government regulation and support; rather, FFCs engaged in their disinformation campaign to undercut growing pressure for government regulation in response to climate science. For all these reasons, the defense of entrapment is unavailable to FFCs.

C. *Reliance Is Not a Defense*

FFCs might also argue that it is unfair to prosecute their lethal conduct because FFCs *relied* on government regulation, grants, and rulings authorizing the criminal conduct in question. A non-trivial amount of fossil fuel production has occurred on land or in waters owned by the U.S. government leased for fossil fuel development.²⁵⁹ Reasonable reliance on apparent or actual government authority is one form of a broader set of mistake-of-law defenses.²⁶⁰ To succeed, defendants must show the specific statement of law on which they relied. Further, the reasonable reliance defense requires "(1) that [a defendant's] reliance on the government official's statement supposedly authorizing [the defendant's] actions was reasonable; and (2) that the statement misled [the defendant] into believing [the defendant's] conduct was legal."²⁶¹

The conduct in homicide doctrine is, generally speaking, causing death. Thus, to successfully raise a mistake-of-law via reliance defense to homicide, FFCs would have to show (1) that a government agent of apparent authority

258. See, e.g., *Jacobson v. United States*, 503 U.S. 540, 548 (1992); *6.2 Entrapment Model Jury Instructions*, UNITED STATES COURT FOR THE NINTH CIRCUIT (Sept. 2018), <https://perma.cc/7WA3-GNCK>.

259. See, e.g., *About the BLM Oil and Gas Program*, BUREAU OF LAND MGMT., U.S. DEP'T OF THE INTERIOR, <https://perma.cc/N796-J84X>.

260. See Dressler, *supra* note 197, at 170–78.

261. *United States v. Xiong*, No. 16-CR-167 (SRN/HB), 2017 WL 123428 (D. Minn. 2017), at *3 (citing *United States v. Benning*, 248 F.3d 772, 775 (8th Cir. 2001)).

assured FFCs that it was not a crime to cause death in any of the various ways detailed above, and (2) that FFCs were genuinely misled into believing that it was not a crime to cause death in any of those ways.

If the defense were not constructed in this way—if all a defendant needed to prevail was to demonstrate that they caused death by engaging in conduct that they believed would not be a crime had they not had a culpable mental state and death had not resulted from it—the result would be that any person or corporation engaging in a licensed or regulated activity that negligently, recklessly, or illegally caused death would be able to claim the defense. For example, driving is authorized, subsidized, and regulated by federal and state governments, but driving in a manner that negligently or recklessly causes death is still a crime. As the PG&E conviction on multiple manslaughter charges shows, businesses that are subject to extensive state and federal regulation can be put on notice that their operations are dangerous or lethal and prosecuted for negligent or reckless conduct that proves lethal. In combination with their failure to take sufficient precautions, notice has served as the basis of homicide prosecutions in numerous cases.²⁶²

Reliance is thus unavailable to FFCs as a defense.

D. Preemption Is Not a Defense

FFCs might also claim that federal regulations *preempt* enforcement of state criminal laws against them for acts committed while engaging in federally regulated behavior.²⁶³ Preemption occurs when enforcement of a state law either directly conflicts with federal law or impinges on a field that Congress intended to exclusively occupy with federal regulation. A preemption defense fails on several fronts. Most directly relevant to preemption doctrine, preemption of general criminal laws is an implausible interpretation of congressional intent. States' ability to prosecute homicides within their borders is a core state police power around which federal courts correctly tread very lightly. Congress may, of course, preempt a state's criminalization of the killing of a *federal* agent or *federal* official where Congress intends the federal government to manage all such prosecutions itself. But it has never attempted to preempt general homicide doctrine by passing a more general federal homicide statute, let alone a more modest—and civil rather than even criminal—regulatory statute.

No authority suggests that Congress intended to exert exclusive jurisdiction over general crimes committed by actors engaged in the regulated conduct. It is also difficult to see why Congress would try to bar states from prosecuting all homicides in a regulated field, particularly when state prosecutions of

262. See, e.g., discussion of PG&E case, *infra* note 277 and accompanying text.

263. See *Hillsborough Cty. V. Automated Med. Labs., Inc.*, 471 U.S. 707, 713 (1985).

the non-federal crimes do not interfere with federal regulation.²⁶⁴ To understand why, consider that preemption would presumably apply to all cases in the regulated industries, which would be the equivalent of granting immunity from prosecution to a broad class of actors who have previously been prosecuted for crimes committed in the course of heavily regulated conduct.²⁶⁵

Although preemption doctrine is complex and its contours can be difficult to predict, there is no precedent for preemption of any generally applicable criminal law, let alone a homicide statute. Perhaps because it is so implausible, we have been unable to find any consideration of such a broad defense in criminal case law. There is no indication that it has even been raised. It is exceedingly unlikely that a preemption defense would be available in a prosecution under generally applicable homicide law.

E. *Extensive Government Regulation Is Not a Defense*

There is one final related argument that, while not a legal defense *per se*, may serve as an extra-legal objection: if FFCs are guilty of homicide, then they might suggest that the federal and state governments that failed to sufficiently regulate their lethal conduct—or even assisted it by leasing them land on which to develop fossil fuels—are guilty as well;²⁶⁶ and, if federal and state governments are not being prosecuted for homicide, it would be *unfair* to prosecute FFCs for homicide. This line of reasoning suggests that it would be unjust for a government that is in any way involved in the commission of an offense to prosecute another party for that offense.

This view is mistaken on several grounds. First, as discussed above, another person's partial culpability for homicide does not remove one's own. Second, government officials can be prosecuted for homicide if their conduct, undertaken

264. A full review of preemption doctrine is a complex inquiry that lies beyond the scope of this Article and, in the civil context, is the subject of considerable debate. See generally George Horvath, *Avoiding the Preemption Muddle: Reading Professor Bickel and Judge Garland* (Working Paper, 2016) (“Justices have disagreed over just about every important task that courts must perform in analyzing preemption questions.”).

265. See *City of New York v. Chevron Corp.*, 993 F.3d 81, 98 (2d Cir. 2021) (finding that “federal common law claims concerning domestic greenhouse gas emissions are displaced by [the Clean Air Act].”).

266. See Anthony Moffa, *Environmens Rea*, 122 PENN. ST. L. REV. 299, 299, 305 (2018) (arguing that government actors could be prosecuted for environmental policy decisions resulting in death and discussing prosecutions related to the Flint water crisis). This objection is most closely associated with *Juliana v. United States*, 947 F.3d 1159 (9th Cir. 2020). *Juliana* was brought by 21 young plaintiffs against the United States and several federal officials for intergenerational harms under an “atmospheric trust” theory of federal public trust law. Michael C. Blumm & Mary C. Wood, ‘No Ordinary Lawsuit’: *Climate Change, Due Process, and the Public Trust Doctrine*, 67 AM. U. L. REV. 1, 1, 25 (2017).

with a culpable mental state, causes death.²⁶⁷ Third, federal or state governments did not, via extensive disinformation campaigns, attempt to persuade the FFCs that the extensive climate science they and others were producing was mistaken; rather, FFCs obscured and argued against the findings of their own research and the research of other reputable scientists showing that catastrophic harms would likely result from their conduct, and FFCs did that in order to garner the benefits of insufficient regulation and government subsidies.²⁶⁸

FFCs may believe that they befuddled and bankrolled enough public officials to insulate themselves from the consequences of their conduct, and they may express genuine surprise when they are held accountable.²⁶⁹ But as a moral or legal argument, the belief that money, influence, or deception would allow them to cause world-historic harm to human life without consequence is evidence of culpability rather than innocence. Engaging in the production of disinformation designed to sway government actors does not give FFCs the ability to rely on the credulous response of those government actors, even if those government actors should have known better. This non-legal objection is inculpatory, not exonerating. The FFCs may make similar arguments regarding the general public for using fossil fuels. Those arguments would fare similarly.

V. CLIMATE HOMICIDE PROSECUTIONS WOULD BENEFIT THE PUBLIC

States are looking for ways to reduce the lethal harms FFCs are generating. Below, this Article argues that homicide prosecutions may be an effective tool states have for doing so. In the United States, corporations have been held criminally liable—including for homicide—for over a century.²⁷⁰ The extension

267. See, e.g., Grand Jury Felony Indictment, *People v. Lyons*, <https://perma.cc/P49A-T4U6>; see also Moffa, *supra* note 266, at 329–33.

268. See *supra* note 179.

269. In the terms of classical economics, one could say FFCs and prosecutors hold “divergent expectations” about the possible range of outcomes at trial. Divergent expectations are a staple in modern legal theories of litigation. See, e.g., George Priest & Benjamin Klein, *The Selection of Disputes for Litigation*, 13 J. LEGAL STUD. 1, 9 (1984); William M. Landes, *An Economic Analysis of the Courts*, 14 J. L. & ECON. 61, 63 (1971); John P. Gould, *The Economics of Legal Conflicts*, 2 J. LEGAL STUD. 279, 88 (1973).

270. See *United States v. Van Schaick*, 134 F. 592, 594 (S.D.N.Y. 1904) (affirming the conviction of a corporation for manslaughter under a statute providing that “every owner . . . through whose fraud, connivance, misconduct or violation of the law, the life of any person is destroyed shall be deemed guilty of manslaughter,” even though the prescribed penalty of “confinement at hard labor” could not be enforced); *N.Y. Cent. & Hudson River R.R. v. United States*, 212 U.S. 481, 499 (1909) (allowing for a federal prosecution); *State v. Lehigh Valley R.R.* 90 N.J.L. 372, 374 (N.J. 1917) (permitting a negligence-based prosecution of a railroad for involuntary manslaughter in New Jersey); *People v. Ebasco Servs., Inc.*, 354 N.Y.S.2d 807, 811 (N.Y. Sup. Ct. 1974) (holding that, under the state’s newly revised Penal Code, “a corporation. . . may commit [homicide] and be held to answer therefor”); *Commonwealth v. Penn Valley Resorts, Inc.*, 494 A.2d 1139, 1142–43 (Pa. Super. Ct. 1985)

of homicide doctrine to corporations is linked to the advent of modern industrial harms that corporations began generating at increasing scale at the end of the nineteenth century.²⁷¹ Witnessing and abhorring a growing number of deaths made possible in the modern industrial era, lawmakers looked to criminal law as a means to hold corporations accountable.²⁷²

A. Precedents for Homicide Charges

There are several notorious early examples. For example, prosecutors sought homicide convictions for the deaths of passengers aboard the General Slocum steamship,²⁷³ for workers killed in or attempting to escape the Triangle Shirtwaist Factory Fire,²⁷⁴ and for the deaths of patrons in the Coconut Grove Nightclub fire.²⁷⁵ More recently, federal prosecutors brought manslaughter and other charges against BP Exploration and Production Inc. for its conduct leading to and after the 2010 Deepwater Horizon disaster. BP pleaded guilty and was sentenced to pay \$4 billion in criminal fines and penalties, still the largest criminal monetary resolution in U.S. history.²⁷⁶ And, in 2019, California prosecutors charged Pacific Gas and Electric with homicide for deaths related to a 2018 wildfire that killed over eighty people and destroyed over 18,000 structures.²⁷⁷

(holding that a corporation is a person within the statutory definition of involuntary manslaughter); *Vaughan & Sons, Inc. v. State*, 737 S.W.2d 805, 810–11 (Tex. Crim. App. 1987) (en banc) (extending liability to Texas corporations after statutory reform). *See also, generally*, Michael B. Bixby, *Workplace Homicide: Trends, Issues, and Policy*, 70 OR. L. REV. 333, 335–36 (1991).

271. For discussion of contemporaneous changes in tort law, *see generally* Donald G. Gifford, *Technological Triggers to Tort Revolutions*, 11 J. TORT L. 1 (2018).
272. In this sense, corporate homicide is appropriately viewed as complementing the simultaneous rise of the public welfare offense. *See* Francis B. Sayre, *Public Welfare Offenses*, 33 COLUM. L. REV. 55, 60–62 (1933).
273. *See Van Schaick*, *supra* note 270, at 594 (consolidating the Slocum cases).
274. *See generally* DAVID VON DREHLE, *TRIANGLE: THE FIRE THAT CHANGED AMERICA* (2004).
275. *Commonwealth v. Welansky*, 55 N.E.2d 902, 907 (1944); *see also* Daniel J. Fleming, *The Coconut Grove Revisited: U.S. Navy Records Document How 492 Died in a Deadly Nightclub Fire 75 Years Ago*, PROLOGUE MAGAZINE (Fall 2017), <https://perma.cc/DX3Y-M3HJ> (detailing the timeline of the fire).
276. *BP Exploration and Production, Plea Agreement, United States v. BP Exploration and Production Inc.*, No. 2:12-cr-00292 (E.D. La. 2012), at 4.
277. The fire, known as the Camp Fire, began when power lines came into contact with dry brush. PG&E plead guilty to 84 counts of involuntary manslaughter and, in addition to the \$13.5 billion it paid people who lost homes and businesses as part of its bankruptcy settlement, agreed to pay a \$3.5 million fine and an additional \$500,000 to cover the costs of the investigation. *See* Ivan Penn & Peter Eavis, *PG&E Pleads Guilty to 84 Counts of Manslaughter in Camp Fire Case*, N.Y. TIMES (June 16, 2020), <https://perma.cc/R59U-4DDP>. PG&E has also pledged to spend an estimated \$15 to \$20 billion to bury over 10,000 miles of powerlines. Ivan Penn, *PG&E Aims to Curb Wildfire Risk by Burying Many Power Lines*, N.Y. TIMES (July 21, 2021), <https://perma.cc/5ZA6-VFLB>.

Each of these precedents pales in comparison to a potential climate homicide prosecution along multiple dimensions: the scope of the harm FFCs have generated, the scope of the evidence about which they were aware, and the extent of disinformation promoted regarding the lethal risks their business generated.²⁷⁸ Most of the precedents involve scores of deaths, or at most roughly 1,000—not thousands, tens or hundreds of thousands, nor millions. In no case (barring BP) were the defendants as technically sophisticated as fossil fuel companies, nor were they aware of and helping to create the research detailing the extent of the lethal risks they were running. And in no case did the defendants engage in extensive, multi-decade disinformation campaigns about their lethal activity to forestall policymakers from intervening and less lethal competition from emerging.

B. *Negative and Positive Lessons Recommend Prosecution*

The closest historical analog to FFCs in terms of lethality,²⁷⁹ awareness, and disinformation campaigns may be the tobacco industry's production and sale of carcinogenic products despite the well-documented risks to the public. Tobacco companies themselves were keenly aware of—and anxious about—the potential for criminal liability for tobacco-related deaths. As an attorney for Brown & Williamson wrote in a memo fretting over how much knowledge the company should admit to:

If we admit that smoking is harmful to “heavy” smokers, do we not admit that BAT [British American Tobacco, Brown & Williamson's parent company] has killed a lot of people each year for a very long time? Moreover, if the evidence we have today is not significantly different from the evidence we had five years ago, might it not be argued that we have been “willfully” killing our customers for this long period? Aside from the catastrophic civil damage and governmental regulation which would flow from such an admission, I foresee serious criminal liability problems.²⁸⁰

Although public demand for criminal prosecution was reduced by both the master settlement agreement and industry campaigns to blame smokers for

278. One benefit of the scope of the harm and the number of coordinated acts involved in both the fraud and anti-trust offenses is that prosecutors can charge large groups of FFCs with conspiracy or racketeering and then try them together. Civil plaintiffs are already doing this. *See, e.g.*, Complaint, Muns. Of P.R., *supra* note 176.

279. NAT'L CTR. FOR CHRONIC DISEASE PREVENTION & HEALTH PROMOTION OFF. ON SMOKING & HEALTH, THE HEALTH CONSEQUENCES OF SMOKING—50 YEARS OF PROGRESS: A REPORT OF THE SURGEON GENERAL 659 (2014), <https://perma.cc/E6GM-5TA7> (estimating that tobacco is responsible for over 480,000 deaths each year in the United States).

280. Draft memorandum from J. Kendrick Wells III, Brown & Williamson Corporate Counsel, on New Strategy on Smoking & Health (June 1980), <https://perma.cc/TL4L-TRLM>.

smoking-related harms,²⁸¹ tobacco companies were unable to gain immunity from criminal prosecution as one of the terms of the settlement.²⁸² As a result, legal analysts who have considered the issue believe that homicide prosecutions against big tobacco under state law are still available.²⁸³

In the case of tobacco, the choice of a settlement in which states benefited from tobacco sales is generally seen as a negative example of how to manage large-scale corporate lethality. It allowed the industry to continue producing, marketing, and distributing a product proven to be both addictive and lethal, and it tied public coffers to the industry's bottom line.²⁸⁴ The bargain big tobacco struck, nearly all public health observers have since concluded, was not just toothless, allowing the industry to expand its reach, globally at first, and then domestically with vaping products; it created the worst kind of moral hazard: if they wanted to fight tobacco addiction, disease, and morbidity, states would have to give up substantial revenue every year. Had prosecutors rejected a profit-sharing scheme and instead brought criminal cases against big tobacco, millions of lives might have been saved.²⁸⁵ Michael Moore, the Attorney General of Mississippi from 1988 to 2004, called the result a "moral treason," in which "the losers are the people."²⁸⁶

There are, however, positive lessons to be learned from other industries facing possible homicide prosecutions. Although the full extent of the Sackler family's and Purdue Pharma's responsibility for deaths related to Oxycontin addiction and overdoses is not fully resolved, Purdue Pharma has already agreed to pay \$8 billion for related federal crimes, including a \$2 billion criminal

281. See generally NAOMI ORESKES & ERIK M. CONWAY, *MERCHANTS OF DOUBT: HOW A HANDFUL OF SCIENTISTS OBSCURED THE TRUTH ON ISSUES FROM TOBACCO SMOKE TO GLOBAL WARMING* (2010).

282. Kelsey Romeo-Stuppy et al., *Criminal Liability for Tobacco Corporations and Executives*, 31 *TOBACCO CONTROL* 355–57 (2022); see e.g., *Summary of Key Points in the Master Settlement Agreement*, PENNSYLVANIA ATTORNEY GENERAL, <https://perma.cc/E428-EHKT>.

283. See, e.g., *Williams v. Philip Morris Inc.*, 127 P.3d 1165, 1179 (Or. 2006) ("Philip Morris's actions, under the criminal statutes in place at the beginning of its scheme in 1954, would have constituted manslaughter . . . Today, its actions would constitute at least second-degree manslaughter, a Class B felony.").

284. See, e.g., Walter J. Jones & Gerard A. Silvestri, *The Master Settlement Agreement and Its Impact on Tobacco Use 10 Years Later: Lessons for Physicians About Health Policy Making*, 137 *CHEST* 692, 697 (2010) ("Once the [master settlement] agreement established that [master settlement agreement] monies would not be 'dedicated' (that they could be used in any way a state saw fit), the die was cast."); See generally MICHAEL PERTSCHUK, *SMOKE IN THEIR EYES: LESSONS IN MOVEMENT LEADERSHIP FROM THE TOBACCO WARS* (2001).

285. See Steven A. Schroeder, *Tobacco Control in the Wake of the 1998 Master Settlement Agreement*, 350 *N. ENG. J. MED.* 293, 295 (2004) ("[T]he consensus that has emerged is that the public lost a golden opportunity to improve its health.").

286. *Id.* at 296.

forfeiture not eligible for elimination in bankruptcy,²⁸⁷ and a lifetime ban from the opioid industry for the Sacklers.²⁸⁸ Under the terms of their respective proposed settlements, Purdue and the Sacklers must also make public over 30 million documents, including some previously withheld as privileged legal advice.

Perhaps most significantly, under the terms of Purdue Pharma's September 2021 proposed settlement, the company would enter into a plan that legally dissolves the pharmaceutical manufacturer and restructures it into a public benefit corporation that has a core focus of addressing the opioid crisis and repaying individuals and families who were damaged by its products.²⁸⁹ That sweeping proposal, a radical shift by a corporation valued in the billions, is now seen as too lenient by many, and has been rejected by a federal judge because it would have protected members of the Sackler family from additional litigation.²⁹⁰

Homicide charges against the Sacklers and Purdue Pharma remain an option, and the current proposals on the table from the defendants can be seen as reflecting a constructive response to the credible threat of criminal prosecution.²⁹¹ In particular, Purdue Pharma's proposed restructuring as a public benefit corporation, precisely because it would align the corporation's incentives with redressing the harm it has caused, alters the costs and benefits of pursuing homicide charges. States would have to ask themselves: what would prosecution of a company devoted to fighting opioid addiction accomplish that the threat of prosecution has not already accomplished?²⁹²

Public benefit corporations are for-profit corporations that are typically required to consider the impact of their decisions on the environment, shareholders, employees, customers, specific communities, and the public.²⁹³ This corporate structure is designed to balance the goal of maximizing profit with a

287. *Justice Department Announces Global Resolution of Criminal and Civil Investigations with Opioid Manufacturer Purdue Pharma and Civil Settlement with Members of the Sackler Family*, UNITED STATES DEP'T OF JUSTICE (Oct. 21, 2020), <https://perma.cc/XX32-Q8JH>.

288. *Opioid Settlements*, NEW YORK STATE ATT'Y GENERAL, <https://perma.cc/2M59-TSFU>.

289. Jonathan Randles, *Purdue Pharma Bankruptcy Plan Approved, Freeing Sacklers From Lawsuits*, WALL ST. J. (Sept. 1, 2021), <https://perma.cc/22ES-DWFB>.

290. Geoff Mulvihill, *Judge Rejects Purdue Pharma's Sweeping Opioid Settlement*, AP NEWS, (Dec. 16, 2021), <https://perma.cc/Z46Z-LE7S>.

291. See John Seewer & David Collins, *For Families, \$6B Deal with OxyContin Maker is Just a Start*, AP NEWS (Mar. 4, 2022), <https://perma.cc/78GZ-TMA6>.

292. The question of the Sacklers' criminal prosecution for their involvement in opioid-related homicides is another matter, as they have not yet aligned their interests with the public good.

293. Other companies, including Danone, King Arthur Flour, and Method, have restructured as public benefit corporations. REBECCA HENDERSON, REIMAGINING CAPITALISM IN A WORLD ON FIRE 153 (2020) [hereinafter HENDERSON, WORLD ON FIRE] (detailing the impact of restructuring on practices in these companies); Lara Aryani & Jess Gorski, *PBCs and the Pursuit of Corporate Good*, HARV. L. SCHOOL FORUM ON CORP. GOVERNANCE (December 9, 2022), <https://perma.cc/P54A-FF5A> (describing the emergence and success of these large public benefit corporations); David Gelles, *Billionaire No More: Patagonia Founder Gives Away Company*, N.Y. TIMES (Sept. 14, 2022),

commitment to pursue the public good.²⁹⁴ Public benefit corporations are also required to report transparently on their social and environmental performance and may be held legally accountable for their actions by stakeholders.²⁹⁵

It is impossible to say how many lives would be saved if FFCs, in response to threats of homicide prosecution, entered into similar agreements. But compared with the status quo, and depending on whether and when climate tipping points are reached, reduced mortality could range from hundreds of thousands to millions of lives in the United States alone, with significantly larger numbers globally.

C. Homicide Prosecution Would Support Uniquely Effective Remedies

Existing attempts at civil and regulatory remedies have yet to abate FFCs' ongoing lethal conduct. Federal courts, at the FFCs' request, have blocked serious regulatory measures and have prevented many private civil suits from proceeding.²⁹⁶ This is, in no small part, by FFCs' design. Judicial appointments to federal courts supported by FFC-funded research, appointments-related lobbying, and political campaigning have all helped generate a pipeline of judges supportive of holdings favoring FFCs.²⁹⁷ With an anti-regulatory majority on the Supreme Court, with regulatory bodies like the EPA facing new restrictions on their power over private actors,²⁹⁸ and with little prospect of private redress, the criminal law may offer an effective tool for states to shift FFC's conduct from lethal to beneficial.

294. See Briana Cummings, *Benefit Corporations: How to Enforce a Mandate to Promote the Public Interest*, 112 COLUM. L. REV. 578, 581–82 (2012); Michael B. Dorff, *Why Public Benefit Corporations?*, 42 DEL. J. CORP. L. 77, 79–82 (2017).

295. HENDERSON, *WORLD ON FIRE*, *supra* note 293.

296. Ian Millhiser, *Republicans Have an Agenda All Right, and They Don't Need Congress for It*, N.Y. TIMES (Mar. 30, 2021), <https://perma.cc/E42U-EHKT> (“One of the most important legal developments in the last few years . . . is that a majority of the [Supreme Court] called for strict new limits on federal agencies’ power to regulate the workplace, shield consumers and protect the environment The result is that . . . business conservatives . . . walk away with big wins, while voters have less access to health care and breathe dirtier air.”); IAN MILLHISER, *THE AGENDA: HOW A REPUBLICAN SUPREME COURT IS RESHAPING AMERICA* 29 (2021). The tide may be turning in civil litigation, with one significant plaintiffs’ victory in Montana, *Held v. Montana*, Cause No. CDV-2020-301 (Aug. 14, 2023), <https://perma.cc/A3FA-QNM2>, and several other cases apparently moving toward trial after years of procedural wrangling, *see, e.g.*, Katie Surma, *Climate Litigation Has Exploded, but Is It Making a Difference?*, INSIDE CLIMATE NEWS (July 27, 2023), <https://perma.cc/6NT7-SKAV>; *see also supra* note 181 and accompanying text listing these civil lawsuits.

297. Millhiser, *supra* note 296.

298. *See West Virginia v. EPA*, 142 S. Ct. 2587, 2616 (2022) (holding that the EPA lacks authority to shift the mix of electric power generation nationwide to overall cleaner methods); *see also* William W. Buzbee, *Anti-Regulatory Skewing & Political Choice In UARG*, 39 HARV. ENVTL. L. REV. 63, 63–64 (2019); Jacob M. Schlesinger, *Biden’s Hurdle: Courts Dubious of Rule by Regulation*, WALL ST. J. (Mar. 2, 2021), <https://perma.cc/WH3V-6ZUZ>.

A significant advantage of state criminal prosecution lies in the greater federal deference to state criminal law enforcement relative to civil claims or regulatory action.²⁹⁹ Although federal courts have increasingly held that regulatory actions and tort remedies against FFCs for climate-related harms under state law are preempted by federal regulatory schemes, federal courts have accepted only narrow federal preemption of criminal statutes.³⁰⁰ While powerful actors may use their money and influence to capture federal agencies or federal courts in ways that effectively block state-level civil remedies, relatively robust federal deference to state criminal prosecutions would require FFCs to capture the legislatures and courts of every jurisdiction where they caused a death, something they are far less likely to accomplish.³⁰¹

There are other reasons why the criminal law is well suited to addressing FFCs' conduct. Where tort law merely prices harmful conduct, criminal law prohibits it—and provides tools to stop it.³⁰² Under tort law, corporations may find it acceptable to impose harms where their ledger sees a sufficient net profit notwithstanding liabilities they may incur. Under criminal law, the breadth of responses available to the state is appropriately broader than just the monetary value of the harm, including not only fines, but property seizure, injunctive relief, compulsory program participation, mandated apologies, public shaming and, for humans, incarceration and even death. Where harms are criminal rather than merely economic, and public rather than private, states have a much deeper interest in regulating conduct, and their ability to intervene is far more extensive. The current state of affairs demonstrates that wrongful conduct that is extremely profitable may require more than the threat of fines to remedy. Prosecutors can bring several effective modes of action, influence, and relief to bear.

Increasingly, FFCs are facing climate-related legal claims that have criminal analogues. The cases fall into a few general types: common law actions for injunctive relief,³⁰³ common law actions seeking damages for harms of cli-

299. See, respectively, *City of New York v. Chevron Corp.*, 993 F.3d 81, 85 (2d Cir. 2021), and *People ex. rel. James v. Exxon Mobil Corp.*, No. 452044/2018, 2019 WL 6795771, at *1 (Sup. Ct. N.Y. Dec. 10, 2019); see, e.g., *West Virginia v. EPA*, 142 S. Ct. 2587, 2616 (2022) (barring the EPA from regulating power plant carbon dioxide emissions to reduce risks related to climate change). New York lost its action alleging securities fraud after a 12-day bench trial, and the Second Circuit recently held that New York City's state common law claims against five oil companies were preempted by federal common law and that the relevant federal common law was displaced by the Clean Air Act. *City of New York v. Chevron Corp.*, 993 F.3d at 85; *People ex. rel. James v. Exxon Mobil Corp.*, No. 452044/2018, 2019 WL 6795771 at *1.

300. See *supra* Part II.E.

301. We discuss the reasons for this federal deference above. See *supra* Part IV.D.

302. Robert Cooter, *Prices and Sanctions*, 84 COLUM. L. REV. 1523, 1538–44, 1548–50 (1984) (arguing that criminal law sanctions an activity, while tort law prices it); see also Kenneth W. Simons, *The Crime/Tort Distinction: Legal Doctrine and Normative Perspectives*, 17 WIDENER L.J. 719, 719–25 (2008) (cataloging other differences).

303. See, e.g., *Am. Elec. Power Co. v. Connecticut*, 564 U.S. 410 (2011).

mate change or the costs of adapting to it,³⁰⁴ actions alleging securities fraud for misleading investors or failing to disclose material information regarding harms,³⁰⁵ and actions alleging consumer fraud.³⁰⁶

FFCs have fought these actions aggressively.³⁰⁷ While the Massachusetts and New York Attorneys General were merely investigating Exxon, the company sued them in Texas court, claiming that their investigations into whether it misled or lied to the public and investors about the most serious threat to humanity in recorded history were legally frivolous and motivated by a political agenda rather than by legitimate concerns.³⁰⁸ Among the company's claims was that a statement by a group of 17 attorneys general saying they share a common interest in "ensuring the dissemination of accurate information about climate change" was evidence that the officials were "willing[] to violate First Amendment rights to carry out [their] agenda."³⁰⁹ The District Court for the Southern District of New York rejected Exxon's complaint, noting among other things that, assuming the truth of Exxon's allegations, "they appear to support the AGs' legal theory that Exxon's internal research was consistent with the scientific consensus but that Exxon made statements to the market and the public that suggested otherwise."³¹⁰ Exxon's suit against the Attorney General of the U.S. Virgin Islands met with greater success. Outmatched, the AG withdrew his subpoena, and Exxon dismissed its complaint.³¹¹

To date, most of the litigation has not moved beyond the early stages of procedural wrangling, but the scale is escalating. With over 200 new cases filed against fossil fuel companies for their role in producing climate-related harms and deceptions related to climate harms last year alone,³¹² it is likely that additional evidence will come to light regarding Exxon or other FFCs in coming

304. *See, e.g.*, *Cnty. of San Mateo v. Chevron Corp.*, 294 F.Supp.3d, 934 (N.D. C.A. 2018).

305. *See, e.g.*, *People ex rel. James v. Exxon Mobil Corp.*, 119 N.Y.S.3d 829 (N.Y. Sup. Ct. 2019); Complaint, *Massachusetts v. Exxon Mobil Corp.*, No. 1984-CV-03333-BLS1 (Mass. Super. Ct. filed Oct. 24, 2019).

306. *See, e.g.*, Complaint, *Massachusetts v. Exxon Mobil Corp.*, No. 1984-CV-03333-BLS1 (Mass. Super. Ct. filed Oct. 24, 2019); Complaint, *District of Columbia v. Exxon Mobil Corp.*, No. 1:20-CV-01932 (D.D.C. filed June 25, 2020); Complaint, *State v. Am. Petroleum Inst.*, No. 0:20-CV-01636 (D. Minn. filed June 24, 2020); Complaint, *Connecticut v. Exxon Mobil Corporation*, No. 3:20-CV-01555 (D. Conn. filed Nov. 13, 2020).

307. As one district judge put it, Exxon "r[an] roughshod over the adage that the best defense is a good offense." *Exxon Mobil Corp. v. Schneiderman*, 316 F. Supp. 3d 679, 686 (S.D.N.Y. 2018).

308. *Id.* at 705–712.

309. *Id.* at 710.

310. *Id.* at 709–10.

311. Phil McKenna, *Virgin Islands and Exxon Agree to Uneasy Truce Over Climate Probe*, INSIDE CLIMATE NEWS (July 7, 2016), <https://perma.cc/7MKQ-B9TC>.

312. Joana Setzer & Catherine Higham, *Global Trends in Climate Change Litigation: 2022 Snapshot*, GRANTHAM RCSH. INST. ON CLIMATE CHANGE & THE ENV'T & CTR. FOR CLIMATE CHANGE ECON. & POL'Y 1 (2022), <https://perma.cc/K9YN-WPV8> ("Just over 800 cases were filed between 1986 and 2014, and over 1,200 cases have been filed in the last eight

years. While fully justified, these lawsuits may fall short of the impact that a homicide prosecution would have. They may bring only modest penalties—or even colossal penalties, but ones that FFCs will nonetheless view as tolerable costs of doing business. Homicide not only more accurately describes what FFCs have done; a prosecution for homicide brings the scale of the harm and FFCs’ culpability into focus in ways that even a criminal fraud conviction cannot. FFCs have not simply been lying to the public; they have been killing members of the public at an accelerating rate. Prosecutors should bring that crime to the public’s attention.

In advocating for criminal homicide prosecutions, this Article is not suggesting that imprisonment or the abrupt cessation of fuel production should be a core objective. Rather, prosecution is uniquely suited to holding FFCs accountable in ways that are both meaningful and practically beneficial. The forms of accountability proposed here are not, as punitive versions of deterrence or desert might suggest, the infliction of private or public suffering commensurate with or exceeding the harm the defendant has imposed on others.³¹³ Rather, consistent with more traditional and humane theories of justice,³¹⁴ state power should be used to demand accountability from criminal actors, deploying the most effective tools to shift their conduct from dissembling, exploitation, and harm to truthfulness, engagement, and repair.³¹⁵

Prosecutors have broad powers to negotiate agreements with defendants to serve the public good, and they can use their power to impose imprisonment, asset forfeiture, injunctions, and information-forcing discovery to incentivize broad accountability in their negotiated agreements. The options available to prosecutors are powerful, and below, this Article describes how each might be deployed to serve the people whom prosecutors are sworn to represent.

years.”). With only a handful of lawsuits filed prior to 2005, the number has been growing steadily since.

313. Even devoted deontologists agree with us in this respect. *See, e.g.*, ARTHUR RIPSTEIN, *FORCE AND FREEDOM* 301 (2010) (criticizing theories of justice that reduce to “matching of suffering to wickedness”).

314. *See* John Braithwaite, *Restorative Justice*, in *THE HANDBOOK OF CRIME AND PUNISHMENT* 323 (Michael H. Tonry ed. 2000) (noting that restorative approaches to justice have “been the dominant model of criminal justice throughout most of human history for all the world’s peoples”).

315. *See generally*, Donald Braman, *Punishment and Accountability: Understanding and Reforming Criminal Sanctions in America*, 53 *UCLA L. REV.* 1143 (2006) (laying out both theoretical and practical justifications for accountability-enhancing sentencing); *see also* Amy Westervelt, *Accountability Must Be the First Climate Solution*, *DRILLED NEWS* (Jul. 21, 2023), <https://perma.cc/JAX5-TTFQ> (describing the importance of accountability in developing coherent climate policy).

1. Settlements Predicated on Criminal Liability

The most direct method for shaping FFCs' behavior would be through negotiated settlements tied to the criminal conduct charged. Examples of settlement terms drawn from other cases and defendants include restructuring the defendant corporation into a public benefit corporation; reforming the board of the defendant corporation to include agents that will align future conduct with the public good; requiring legally binding commitments by the defendant corporation to forego certain practices; requiring payments by the corporation to establish ongoing practical remedies to the harm it has generated; publicly disclosing all records relating to the defendant corporation's misconduct; and requiring apologies and cash payments to those harmed.

a. Restructuring FFCs as Public Benefit Corporations

The benefits of restructuring FFCs into public benefit corporations are, as touched on above, among the most attractive options that a prosecution might seek as part of a settlement.³¹⁶ Unlike homicide cases involving individuals, where the state can at most detain and attempt rehabilitation, homicide cases involving corporations invite a more rigorous adjustment of the culture and incentives of the guilty party. Historically, corporate criminal offenders have avoided harsh penalties because remedies that destroy the value of a business and its assets could also harm the public.³¹⁷ But with the emergence of public benefit corporations—organizations that generate profits but do so in pursuit of the public good—states can now pursue a productive restructuring as part of a settlement.

The settlement terms proposed by Purdue Pharma and the Sacklers provide edifying examples of what can and cannot be done under the threat of criminal prosecution. No state can force the Sacklers to care about the public good; but Purdue Pharma the corporation can be restructured as a public benefit corporation that, as part of its charter, would be required by law to care about harms associated with its opioid production and pursue remedies. Similarly, although it would be legally impossible to sentence all members of the Sackler family—including future generations—to devote future earnings to remedying the harms related to opioid addiction to which the family contributed, the same is not true

316. In broad strokes, this would resemble the proposed restructuring of Purdue Pharma to help redress the harm it caused in feeding the opioid addiction crisis. See Taleed El-Sabawi & Leo Beletsky, *Purdue's Demise Could Be A New Beginning For The Pharmaceutical Industry*, HEALTH AFFS. BLOG (Dec. 18, 2020), <https://perma.cc/W6WH-3YBV>.

317. Guidance for federal prosecutors explicitly includes consideration of collateral harms to shareholders and employees. See U.S. ATTORNEYS' MANUAL § 9–28.1100 (U.S. DEP'T OF JUS. 2015); see also Andrea Amulic, *Humanizing the Corporation While Dehumanizing the Individual: The Misuse of Deferred-Prosecution Agreements in the United States*, 116 MICH. L. REV. 123, 135–39 (2017) (arguing that this concern has led to underenforcement against corporations).

for corporations like Purdue Pharma. Corporations that commit crimes, unlike humans, can be rewritten into different forms with different commitments, and this fundamental rewriting is both ethical and morally appropriate where the harm and culpability are serious. Thus what would normally be conceived of as impossibly harsh and controlling for human defendants is practical and appropriate for corporate defendants.

Conversely, while states may have little concern about the lost industry of any individual Sackler family member convicted of a serious crime and sentenced to prison, many would have serious reservations about stopping the work of a multi-billion dollar corporation on which the healthcare sector relies for many medications.³¹⁸ Because the public would arguably be significantly harmed were Purdue Pharma effectively put out of business, Purdue and the Department of Justice have instead proposed that the restructured Purdue, in addition to ceasing anti-social practices like aggressive marketing of opioids, and in addition to devoting its profits towards the treatment of opioid addiction, will also continue to manufacture important medications.³¹⁹ FFCs, on this account, could be restructured in much the same way, reducing the production and distribution of fossil fuels at the fastest pace feasible, but not so fast as to cause harm, while protecting displaced workers and local economies and investing in the development and deployment of clean energy.

By working to defeat alternative energy competition, as well as defeat policies that would diminish or disincentivize fossil fuels or promote alternatives, FFCs have kept the United States dependent on their product, and they bear significant responsibility for the nation's and the world's failure to shift to alternative energy more quickly. In large part due to FFCs' success, states cannot end fossil fuel usage in their borders overnight, and they would be foolish to try. Public-benefit restructuring solves this problem and overcomes the most important barrier to prosecuting FFCs: developing a plan for harm reduction and remediation that doesn't needlessly destroy corporate value or harm the public.

318. This is part of a broader concern about the collateral consequences of punishing corporations, and debates over whether criminal prosecution of corporations is ever useful. See Stephen A. Yoder, *Criminal Sanctions for Corporate Illegality*, 69 J. CRIM. L. & CRIMINOLOGY 40, 45 (1978); see generally Brent Fisse, *Reconstructing Corporate Criminal Law: Deterrence, Retribution, Fault, and Sanctions*, 56 S. CAL. L. REV. 1141 (1983); V. S. Khanna, *Corporate Criminal Liability: What Purpose Does it Serve*, 109 HARV. L. REV. 1477 (1996).

319. See Beletsky *supra* note 316; *Justice Department Announces Global Resolution of Criminal and Civil Investigations with Opioid Manufacturer Purdue Pharma and Civil Settlement with Members of the Sackler Family*, OFFICE OF PUB. AFFS. (Oct. 21, 2020), <https://perma.cc/56LL-7HVM> (“[N]ot only will the PBC endeavor to deliver legitimate prescription drugs in a manner as safe as possible, but it will aim to donate, or provide steep discounts for, life-saving overdose rescue drugs and medically assisted treatment medications to communities, and the proceeds of the trust will be directed toward State and local opioid abatement programs.”).

b. Fines and Cash Payments to Those Harmed

Fines and cash payments to harmed parties are other potential sanctions, though historically such awards have been notoriously ineffective at shaping future conduct.³²⁰ In light of the tobacco industry's ability to continue inflicting lethal harm after its Master Settlement Agreement, it would appear that allowing FFCs to pay cash for their lethal conduct is profoundly unwise.³²¹ However, if such payments were accompanied by a corporate restructuring and other terms described above, cash transfers could be an acceptable part of broader accountability measures.

c. Boards, Monitors, Warnings, Disclosures, and Other Terms

In addition to a corporate restructuring, prosecutors could require FFCs to reconstitute their boards with a broader set of stakeholders;³²² appoint an independent monitor;³²³ implement new policies and procedures to prevent similar incidents from occurring in the future; and create corporate compliance programs.³²⁴ These are fairly standard terms of a settlement. Additional remedies could include requiring FFCs to display prominent warning signs alerting the public to the lethal consequences associated with the production, distribution, and use of fossil fuels;³²⁵ refrain from further exploration of fossil fuel

320. One recent and prominent example can be found in the Consumer Financial Protection Bureau's "ordering Wells Fargo Bank to pay more than \$2 billion in redress to consumers and a \$1.7 billion civil penalty for legal violations across several of its largest product lines." *CFPB Orders Wells Fargo to Pay \$3.7 Billion for Widespread Mismanagement of Auto Loans, Mortgages, and Deposit Accounts*, CONSUMER FIN. PROT. BUREAU (Dec. 20, 2022), <https://perma.cc/2E8Y-RGWV>. CFPB Director Rohit Chopra acknowledged in his remarks announcing the order that even fines and payments this large "will not fix Wells Fargo's fundamental problems," and encouraged other enforcement agencies to take action. Rohit Chopra, Directory, Consumer Financial Protection Bureau, *Prepared Remarks of CFPB Director Rohit Chopra on the Wells Fargo Law Enforcement Action*, CONSUMER FIN. PROT. BUREAU (Dec. 20, 2022), <https://perma.cc/9CKU-HL5Z>.

321. See discussion *supra* Part V.A (discussing moral hazards related to cash payments in the context of tobacco liability).

322. This is fairly common in bankruptcy cases following criminal conduct. E.g., in 2004, Enron was ordered to make changes to its board of directors as part of a settlement with the DOJ and the SEC following its bankruptcy and the discovery of accounting fraud at the company. *In re Enron Corp.*, Case No. 01-16034 (AJG) (Jointly Administered) (Bankr. S.D.N.Y. Jul. 15, 2004) (ordering the removal of the existing board of directors and installing a new board); see also Enron Corp., Public Utilities Holding Act Release No. 35-27810 (Mar. 9, 2004).

323. See generally Lana N. Pettus, *Court-Appointed Corporate Monitors in Environmental Crimes*, 69 DEP'T OF JUST. J. FED. L. & PRAC. 6 (2021).

324. See Veronica Root Martinez, *Third Party and Appointed Monitorships*, in CAMBRIDGE HANDBOOK OF COMPLIANCE 605-15 (Benjamin van Rooij & D. Daniel Sokol eds., 2021).

325. These types of warnings are fairly common. Tobacco companies, for example, are required to post warning labels on cigarette packages. Tobacco Products; Required Warnings for Cigarette Packages and Advertisements, 85 Fed. Reg. 15,638 (Jun. 18, 2021) (to be codified at 21 C.F.R. pt. 1141). Similar warnings have been required of companies producing

sources;³²⁶ make public apologies in prominent fora;³²⁷ and disclose all related internal documents and decision-making to a publicly accessible archive.³²⁸

2. *Alternatives to a Negotiated Settlement*

FFCs should agree to terms as sweeping as these because prosecutors have many other powerful tools, the use of which would be far less desirable to them. The first and most direct method for shaping FFCs' behavior outside of a settlement would be through civil injunctions tied to the criminal conduct charged.³²⁹ If states can show that FFCs are killing their residents through criminal conduct, prosecutors could ask courts to enjoin FFCs from the relatively unrestrained and increasingly lethal activity from which they currently profit.³³⁰ If any FFC were unwilling to settle to the terms described above, prosecutors could attempt to enjoin the holdout from doing business in the state altogether, providing greater market share to more compliant, pro-social competitors.

alcohol, Alcoholic Beverage Labeling Act (ABLA), 27 U.S.C. § 215 (2018), children's toys, Consumer Product Safety Act (CPSA), 15 U.S.C. § 2051 (2018), and airbags, Federal Motor Vehicle Safety Standard No. 208, 49 C.F.R. § 571.208 (2018), for example.

326. Restraint of harmful conduct via injunction is common in criminal cases. See Mary M. Cheh, *Civil Remedies to Control Crime*, 9 CRIME PREVENTION STUD. 45–66 (1998).
327. See Dan M. Kahan & Eric A. Posner, *Shaming White-Collar Criminals: A Proposal for Reform of the Federal Sentencing Guidelines*, 42 J.L. & Econ. 365, 367 (1999), citing Richard Phillips, *Shame as a Deterrent*, CHI. TRIB. Section 1 at 20 (July 27, 1988) (company ordered to publish apologies for dumping carcinogenic chemicals).
328. This would be similar to the proposed settlement requiring Purdue Pharma and the Sacklers to disclose over 30 million documents related to their misconduct. See Jan Hoffman, *Purdue Pharma Is Dissolved and Sacklers Pay \$4.5 Billion to Settle Opioid Claims*, N.Y. TIMES (Sept. 1, 2021), <https://perma.cc/9A9L-2G5M>.
329. Injunctions are routinely used at the federal and state level to combat crime. See OFF. OF THE DEPUTY ATT'Y GEN., U.S. DEP'T OF JUST., REPORT OF THE ATTORNEY GENERAL'S CYBER DIGITAL TASK FORCE (2018), <https://perma.cc/E6WN-SQY8> (noting that the Department of Justice “often uses civil injunctions, as well as seizure and forfeiture authorities” to disrupt criminal conduct); Shauni Tyler Lynch, *New Function for an Injunction: Department of Justice Utilizes Temporary Restraining Order to Stop Excessive Prescribing and Selling of Opioids – Will Massachusetts Follow Suit?*, 25 SUFFOLK J. TRIAL & APP. ADVOC. 275, 278–80 (2019) (describing the use of civil injunctions to stop excessive prescribing of narcotics); *Justice Department Files Action to Enjoin Texas Doctors From Illegally Prescribing Highly Addictive Opioids and Other Controlled Substances* (May 10, 2019), <https://perma.cc/AR9X-AEAR>. See generally MATTHEW D. O'DEANE, GANG INJUNCTIONS AND ABATEMENTS: USING CIVIL REMEDIES TO CURB GANG-RELATED CRIMES (2012) (reviewing the many cases where civil injunctions were used to disrupt criminal gang activity).
330. See, e.g., 18 U.S.C. § 1964(a) (empowering federal courts to ejoin corporations from engaging in illegal conduct). State courts are similarly empowered. See, e.g., Florida Statute Section 895.05 (“Any circuit court may, after making due provision for the rights of innocent persons, enjoin violations of the provisions of s. 895.03 by issuing appropriate orders and judgments”).

A second, complementary action states could take would be to seize FFCs' property with probable cause to believe that it was involved in criminal conduct.³³¹ Derived from common law doctrine holding that any property causing death or bodily injury was "forfeit" and could be seized by the sovereign for the common good,³³² in many states, as well as federally, law enforcement may seize property where there is probable cause that the property is involved in a crime.³³³ The action is one against the property itself, not the suspect or defendant, and thus in many states can be seized absent a criminal indictment. The particulars of forfeiture statutes vary considerably across jurisdictions, but the general theory behind asset seizures is relatively straightforward. They "help to ensure that crime does not pay: They at once punish wrongdoing, deter future illegality, and 'lessen the economic power' of criminal enterprises."³³⁴ If state and local prosecutors have no other timely means of slowing fatalities driven by FFCs' conduct, they could employ the broad seizure powers that a criminal prosecution enables. They could then auction the property to competitor FFCs that agreed to terms more beneficial to the public the prosecutors are sworn to protect.

Third, and finally, prosecutors could seek prison time for the executives of FFCs. Incarceration typically provides few if any direct benefits to anyone.³³⁵ However, it can have several indirect benefits. Foremost, incarceration can encourage other FFCs to cooperate and enter into beneficial settlements. To be effective as an incentive to cease criminal conduct, however, the threat of

331. Under federal law and in many states, "title to property used to commit a crime (or otherwise 'traceable' to a crime) passes to the Government at the instant the crime is planned or committed." *#@Luis v. United States*, 136 S. Ct. 1083, 1085 (2016) (citing 21 U.S.C. § 853(c)). In civil forfeitures, the action is against the property rather than the owner, and the owner has the burden of proof once the state has shown probable cause to believe that the property is connected to criminal conduct. The standard of proof is typically a preponderance of the evidence. *See e.g.*, *United States v. \$250,000 in U. S. Currency*, 808 F.2d 895, 900 (1st Cir. 1987); *United States v. Brock*, 747 F.2d 761, 762 (D.C. Cir. 1984). Seizing property related to criminal conduct is routinely employed by state actors. Alice Dery, *Overview of Asset Forfeiture*, AM. BAR ASS'N: BUS. L. TODAY (June 13, 2012), <https://businesslawtoday.org/2012/06/overview-of-asset-forfeiture/> ("[F]orfeiture is available for over 200 different federal, state, and local crimes.").

332. Paul Schiff Berman, *An Anthropological Approach to Modern Forfeiture Law: The Symbolic Function of Legal Actions Against Objects*, 11 *YALE J.L. & HUMANS* 1, 5, 42, 45 (1999); Jacob J. Finkelstein, *The Goring Ox: Some Historical Perspective on Deodands, Forfeitures, Wrongful Death and the Western Notion of Sovereignty*, 46 *TEMP. L.Q.* 169, 181 (1973); Marc B. Stahl, *Asset Forfeiture, Burdens of Proof and the War on Drugs*, 83 *J. CRIM. L. & CRIMINOLOGY* 2, 295 (1992).

333. David J. Fried, *Rationalizing Criminal Forfeiture*, 79 *J. CRIM. L. & CRIMINOLOGY* 328, 329 n.1 (1988) ("In civil forfeitures, the owner of the property has the burden of proof once the government has shown probable cause to believe that the property is 'guilty,' in other words, connected with the prohibited activity.").

334. *Kaley v. United States*, 134 S. Ct. 1090, 1094 (2014) (quoting *Caplin & Drysdale, Chartered v. United States*, 491 U.S. 617, 630 (1989)).

335. *See generally* DONALD BRAMAN, *DOING TIME ON THE OUTSIDE* (2006).

incarceration needs to be credible;³³⁶ as such, prosecutors may need to bring criminal charges with penalties including detention, at least in early cases involving recalcitrant FFCs. Although we do not view incarceration as a good in itself and have worked to reduce imprisonment, some victims may find a measure of satisfaction in incarceration. In the context of mass-incarceration of less powerful members of our society for harmless or far less harmful acts, incarceration might increase trust in the fairness of the criminal justice system more broadly. However, consistent with our preference for restorative justice, we view incarceration as a least-preferred remedy.

Injunctions, seizures, and imprisonment are not goals in themselves. Rather, they are powerful motivators for executives, shareholders, and whistleblowers to cooperate and fashion a pro-social outcome through public benefit restructuring. In short, criminal prosecution makes the relative benefit of doing the right thing far more attractive to the corporation and all its beneficiaries than a civil suit for monetary damages.

D. Beneficial Effects Outside of Settlement or Conviction

Counterintuitively, then, even a homicide investigation or prosecution that does not produce a settlement or conviction could help save lives. Simply opening an investigation or bringing charges could have beneficial effects related to discovery, shareholder reporting, and norm-shifting.

1. Prosecution Would Generate Valuable Information

First, there are benefits related to the broad discovery powers associated with criminal investigations and cases. Prosecutors can require defendants to disclose all documents and records relevant to the case. Just as importantly, they may depose defendants (including executives and those who supplied them with research and reports) under oath. FFCs are notoriously secretive, and jealously guard as much information about their actions and state of knowledge as legally permitted.³³⁷ Although regulations have some information-forcing ability, trials have become increasingly important sources of information about FFC conduct and mental states.³³⁸ To this end, discovery in criminal cases—even cases that fall short of a homicide conviction—could prove useful in educating the public and laying the groundwork for future criminal or civil cases.³³⁹

336. See Yoder, *supra* note 318.

337. They operate, in other words, with a significant asymmetric information advantage. See generally Lucian A. Bebchuk, *Litigation and Settlement Under Imperfect Information*, 15 RAND J. ECON. 404 (1984).

338. See generally Bradley C. Karkkainen, *Information-Forcing Environmental Regulation*, 33 FLA. ST. U.L. REV. 861 (2006).

339. This is one of the important benefits that many states and cities seek in bringing cases where a successful verdict is uncertain. See generally Robert D. Cooter & Daniel L. Rubinfeld, *An*

2. Prosecution Can Influence Reporting and Shareholder Actions

Second, criminal prosecution would trigger important reporting requirements by FFCs to shareholders and regulators. These reporting requirements include both the potential criminal convictions that could result and the risks that the corporation and its shareholders face as a result. Multiple lawsuits have already been brought against FFCs for failing to alert shareholders, the public, regulators, and legislators about the serious risks their products posed to the public.³⁴⁰ Although FFCs have reported some climate-related risks, they apparently have yet to report on the risks related to exposure to homicide prosecutions and the broader set of potential remedies described above.

Shareholders, in addition to wanting to avoid supporting an industry that generates and then conceals foreseeable and avoidable catastrophic risks to the public, may be sensitive to the potential loss of value in the market following an indictment or conviction for any form of homicide.³⁴¹ Shareholders have already begun to pressure Exxon to take some climate-mitigation action through board elections, driven by a small activist investment firm, and supported by much larger investors. In response to a “rapid shift in public sentiment on climate change,” hundreds of fund managers have joined the United Nations Race To Zero campaign, signing on to the Net Zero Asset Managers Initiative.³⁴² But while these initiatives have promise, they have been criticized as effectively toothless and potentially “greenwashing.”³⁴³ The prospect of prosecution for

Economic Model of Legal Discovery, 23 J. LEGAL STUD. 435 (1994); see also Sushma Subramanian, *US Cities Are Suffocating In The Heat. Now They Want Retribution*, THE GUARDIAN (Jul. 1, 2021), <https://perma.cc/FJ3B-9A2R> (noting that even if a lawsuit against FFCs fails to remedy the harm, “the legal process is expected to reveal new information on what the industry knew of the environmental destruction brought by climate change.”).

340. Connecticut, Delaware, the city of Charleston, South Carolina, and the city of Hoboken, New Jersey. Stephen Singer, *Connecticut Sues ExxonMobil Over Climate Change, Accusing Energy Giant of Misrepresenting Threats to the Environment*, HARTFORD COURANT (Sept. 14, 2020), <https://perma.cc/4ZXX-WZT3>; Rachel Frazin, *Delaware Sues Major Oil Companies Over Climate Change*, THE HILL (Sept. 10, 2020), <https://perma.cc/PXK2-2UMZ>; Emily Bohatch, *Charleston Sues 24 Fossil Fuel Companies, Seeks Money for Climate Change Damages*, THE STATE (Sept. 10, 2020), <https://perma.cc/9KBG-XBT2>; Sebastien Malo, *Hoboken N.J. Joins Other Cities Suing Over Climate Change*, REUTERS (Sept. 2, 2020), <https://perma.cc/4KKD-AUCV>.

341. See, e.g., Matt Phillips, *Exxon’s Board Defeat Signals the Rise of Social-Good Activists*, N.Y. TIMES (June 9, 2021), <https://perma.cc/XA27-K5A5>.

342. *Signatories*, THE NET ZERO ASSET MANAGERS INITIATIVE, <https://perma.cc/EJ42-X8YZ>. “Race To Zero is a global campaign to rally leadership and support from businesses, cities, regions, investors for a healthy, resilient, zero carbon recovery that prevents future threats, creates decent jobs, and unlocks inclusive, sustainable growth.” *Race to Zero Campaign*, UNITED NATIONS CLIMATE CHANGE, <https://perma.cc/GL62-GVY2>.

343. Fiona Harvey, *Bank Group Accused of Exploiting Loopholes and ‘Greenwashing’ in Climate Pledge*, THE GUARDIAN (June 15, 2022), <https://perma.cc/V79E-JX3J> (quoting Beau O’Sullivan of Bank on Our Future: “The only real action we’ve seen from banks is to up their

homicide related to climate-related deaths would give activist investors significant leverage to bring real change to FFCs boardrooms and the funds that support them.

3. *Prosecution Can Encourage Prosocial Public Norms*

Third and finally, even a failed or extended prosecution could have several salutary effects on public opinion and behavior. Prosecution that informs the public of the true extent of FFCs' culpability could help the members of the public exercise their preference for ethical products, shifting their consumption away from fossil fuels. Legislators, similarly, may be less inclined to shield an industry that generates and then conceals catastrophic risks when that behavior is recognized as mass homicide.

A variety of trends are shifting the public toward receptivity to climate science and against the disinformation campaigns of FFCs. These trends also support a successful prosecution. But the converse is also true: a high-quality prosecution would help inform the public and help inoculate it against FFCs' disinformation. A prosecution would help focus public attention in ways that are distinct from typical public education campaigns and debates in important ways. While FFCs can make false or misleading statements to the public with little fear of accountability, doing the same in court carries significant risks. Second, the factual claims in a criminal trial focus attention on particular issues and events and open those who testify to cross-examination, and FFC executives have been more truthful in their in-court statements in response to cross-examination or judicial inquiry than they have been out-of-court.³⁴⁴ Admissions during an investigation or in court could help dispel inaccurate beliefs held by members of the public that FFCs have spread through extensive disinformation and political influence campaigns. Moreover, the motivation supplied by seizure laws and the potential for criminal convictions of individual executives could garner the kind of cooperation that mere threats of financial loss to a corporation have not.

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FFCs benefit from disinformation campaigns designed to confuse the public about the catastrophic consequences of their core business, consequences they have foreseen for decades. If they do not face at least the possibility of being held

greenwashing budget. [The Glasgow Financial Alliance for Net Zero] has huge potential, but sadly it's providing financial institutions with cover to continue, with a few exceptions, business as usual. They need to make a plan to get out of all fossil fuels, including oil and gas, and stop their funding of the [fossil fuel] sector's growth right now.").

344. See, e.g., Warren Cornwall, *In a San Francisco Courtroom, Climate Science Gets Its Day on the Docket*, SCI. INSIDER (Mar. 22, 2018), <https://perma.cc/78ZP-QK5X> (describing a hearing in which Chevron's lead attorney "quickly declared the company is convinced humans are playing a major role in climate change").

accountable for their conduct, they will not only escape justice and have little reason to alter course; they will have made lethal profitability an example for every powerful corporation to study. Prosecutors can, and should, set a different example and teach a different lesson: that no one is above the law, and the law can help restore the public to safety when harm has been done.

Prosecutors wield enormous power, from injunctions to seizures to information-forcing. They are also well situated to shift the conduct of FFCs from lethal to publicly beneficial. Beyond the traditional tools of prosecution lie a host of powers that criminal prosecutors alone can wield. As evidenced by cases like Purdue Pharma, the threat of a criminal conviction can move corporations to shift their business models from public exploitation to the pursuit of public benefit.

CONCLUSION

The acts committed by FFCs are like those supporting many other successful homicide convictions: the corporations disregarded serious risks that were brought to their attention and engaged in conduct that accelerated or contributed to one or more deaths. In another sense, however, the scope of the lethality is so vast that, in the annals of crime, it may eventually dwarf all other homicide cases in the United States, combined. The scale of the crime may invite some readers to think it too vast to admit to anything but a political remedy.

We disagree.

Acts this culpable and harmful should not be beyond the law's reach, even for the most powerful actors in our society. Where the conduct is immoral enough and the harm is great enough, criminal prosecution must be considered as a tool to protect the public. Just as the research conducted by FFCs and others put FFCs on notice that they are generating catastrophic risks, the threat of a homicide prosecution would put them on notice that they can be called to answer for their conduct.

Importantly, homicide prosecutions could make available remedies that states have been unable to access through other means. And because FFCs must consider legal risks in their business planning, simply making FFCs aware of the realistic potential for homicide liability may achieve many of the benefits of a successful prosecution. It is both the moral and practical power of homicide prosecution that make it compelling.

Few would view homicide convictions as goods themselves, independent of benefits to the public. In this respect, a homicide prosecution—or even the credible threat of a homicide prosecution—would have a strong chance of aligning FFCs' incentives with the public good. Indeed, if in response FFCs were to restructure into enterprises that reduced mortality and benefited the public, prosecution might not be necessary to protect the public.

Today, however, FFCs remain exceptionally powerful, profitable, and lethal, and they are acting as though they are above the law. As a result, they are far from pursuing remedies to the harms they are causing, from which prosecutors are sworn to protect the public. If we want FFCs to take the climate-related harms they cause seriously, they must face at least the prospect of incurring legal consequences commensurate with the gravity of those harms. Under a plain reading of the law in jurisdictions across the United States, they are committing mass homicide. Prosecutors should act accordingly.

