

# Shale Games

How the natural gas industry is swindling  
investors, society and the planet

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## About the Critical Corporate Theory Collection

The Critical Corporate Theory Collection is part of the *Systemic Justice Journal*, published by the Systemic Justice Project at Harvard Law School. The Collection is comprised of papers that analyze the role of corporate law in systemic injustices. The authors are Harvard Law students who were enrolled in Professor Jon Hanson's Corporations course in the spring of 2021.

The Collection addresses the premise that corporate law is a core underlying cause of most systemic injustices and social problems we face today. Each article explores how corporate law facilitates the creation and maintenance of institutions with tremendous wealth and power and provides those institutions a shared, single interest in capturing institutions, policies, lawmakers, and norms, which in turn further enhance that power and legitimates its unjust effects in producing systems of oppression and exploitation.

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## **ABSTRACT**

This paper looks at the natural gas industry as an example of the failure of the traditional corporate model in the U.S. under which maximizing shareholder profits supersedes all other goals. The industry has followed part of this model by ignoring, or actively seeking to hide, the negative impacts of its product on stakeholders such as employees, consumers, and society as a whole. This includes deceptive business practices that seek to minimize public knowledge of the serious risks to public health and safety of residential natural gas use, and half-hearted attempts to address natural gas's serious climate impacts. These efforts, however, are not done for the benefit of shareholders. In the last decade in particular shareholder returns from gas companies have collapsed, all while executive pay has continued to climb. The managing class of these companies has managed to harm both shareholders and external stakeholders, all in pursuit of its own profits.

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## INTRODUCTION

*[T]he oil and gas industry is essentially a big casino that can produce both power and triumphant great gobs of cash, often with little regard for merit. That equation invites gangsterism, extortion, thuggery, and the sorts of folks that enjoy these hobbies.*

– Rachel Maddow, Blowout<sup>1</sup>

Natural gas has become a critical source of energy in the United States. Used for electricity generation, heating and cooking in homes, and industrial processes, the fuel has become so widely used throughout the country that the numbers are difficult to comprehend. In 2019, over two million miles of pipelines carried natural gas from production wells to end-users who burned over thirty-one trillion cubic feet of gas, releasing nearly more than one and a half billion metric tons of carbon dioxide into the atmosphere.<sup>2</sup> The companies that operate this tangled web of production, transportation, and delivery of natural gas justify their business on three main grounds: 1) they are providing people with the essential services of heat and electricity, and thus exist to meet these demands, 2) they are helping the country to mitigate climate change by reducing its greenhouse gas emissions through the displacement of dirtier fuel sources, and 3) they are fulfilling their corporate duty of maximizing profit to shareholders. Each of these assertions, however, become suspect when one looks into the actual characteristics and actions of the industry. The industry does more than just passively meeting demand, instead engaging in deceptive practices and widespread lobbying to protect the position of natural gas as an energy source. The environmental benefits are often exaggerated as emissions from natural gas production and transportation are often underestimated, and companies take advantage of outdated federal laws and captured federal agencies to take over both public and private land to drill wells and build pipelines. And, even with these externalities, natural gas has been unprofitable for shareholders for over a decade. This paper examines the natural gas industry as an example of how

corporate power can be abused at the expense of shareholders, the public, and the planet.

## CURRENT DOMINANT NARRATIVES

The first narrative advanced by the natural gas industry to justify its existence is that it is simply meeting consumer demand. One example of this is the Atlantic Coast Pipeline, a now-canceled 600-mile pipeline that would have carried natural gas from West Virginia to Virginia and North Carolina.<sup>3</sup> The consortium of utility companies that sought to build the pipeline justified their proposal by pointing to data from the Energy Information Administration, a federal agency, that predicted a 29% increase in national energy demand by 2040,<sup>4</sup> and a report the consortium commissioned that predicted a 165% increase in natural gas demand in Virginia and North Carolina between 2010 and 2035.<sup>5</sup> The American Gas Association (“AGA”), an natural gas trade organization, adopts a similar passive framing to natural gas demand, stating on its website “For the next decade, domestic natural gas supplies are expected to be sufficiently robust to meet substantial growth in demand across all sectors.”<sup>6</sup> And following the February 2021 power crisis in Texas, Texas Governor Greg Abbott leaned on this framing when he went on Fox News to blame the Green New Deal for the state’s electricity failures and argue that the crisis “show[ed] that fossil fuel is necessary for the state of Texas as well as other states....”<sup>7</sup>

Natural gas companies pair this demand argument with the claim that their product is an important tool in the fight against climate change. In its “Climate Change Position Statement,” the AGA states that its members are “committed to reducing greenhouse gas emissions” and that natural gas “has led the reduction in United States greenhouse gas emissions.”<sup>8</sup> And this argument has at least some grounding in reality. When burned, coal releases 80% more carbon dioxide than natural gas to produce the same amount of energy.<sup>9</sup> Low natural gas prices over the past decade have made modern natural gas power plants cheaper to run than older coal power plants, leading to 121 coal power plants retiring or being converted to natural gas between 2011 and 2019 and natural gas becoming the largest source of electricity nationally in 2016.<sup>10</sup> This shift, along with a smaller rise in renewable energy sources, led to greenhouse gas emissions from the U.S. electricity sector falling by 25% in this ten-year span.<sup>11</sup>

Finally, the natural gas industry points to its compliance with the regulatory structure established by federal and state law to defend

against accusations of harmful conduct. A myriad of laws govern exploration, production, transmission, and use of natural gas, but I will focus on just three of these: The Mineral Leasing Act of 1920, the Natural Gas Act of 1938, and the Energy Policy Act of 2005. The natural gas industry argues that these statutes create a system that encourages the production, transmission, and sale of natural gas, and that the industry shouldn't be blamed for the harmful effects of its actions because they are encouraged by a statutory system created by our elected officials.

The Mineral Leasing Act of 1920 governs the leasing of public lands for oil and gas production in the U.S.<sup>12</sup> The law directs the Bureau of Land Management, a federal agency within the Department of the Interior, to auction off the right to extract oil and gas from parcels of federal land for a minimum bid of two dollars per acre, an annual rental fee of one-and-one-half dollars per acre, and a royalty fee of twelve-and-one-half percent of the value of what is produced.<sup>13</sup> Through this program, more than sixty-seven million acres of federal land have been leased to oil and gas companies since 1987.<sup>14</sup> The industry likes to point out that a portion of this royalty money goes towards the Land and Water Conservation Fund, a federal fund that supports conservation projects at the state and federal levels.<sup>15</sup>

Once natural gas is extracted from wells, it must be transported from the point of production to the point of consumption, a process that can require the gas to be moved hundreds or thousands of miles. The Natural Gas Act was passed in 1938 to regulate interstate pipelines.<sup>16</sup> The law was amended in 1947 to give the Federal Energy Regulatory Commission ("FERC"), a federal agency responsible for permitting interstate energy projects, the authority to allow pipeline companies to take private land through eminent domain to build a pipeline once the agency deemed the project in the public interest.<sup>17</sup> The Energy Policy Act of 2005 goes even further, stating that the importation and exportation of natural gas to and from foreign countries with which the U.S. has a free trade agreement "shall be deemed to be consistent with the public interest" and FERC *must* grant permits for import/export projects "without modification or delay."<sup>18</sup> As with the Mineral Leasing Act, the companies that build and operate interstate natural gas pipelines argue that the provisions of the Natural Gas Act and Energy Policy Act create a system that favors natural gas transmission and sale and that any complaints should be taken up with Congress and FERC.

## THE ROLE OF CORPORATE POWER

The three narratives outlined above, the natural gas industry as a passive supplier, as an environmental savior, and as a well-regulated business, collectively ignore how companies and industry associations have worked behind the scenes to overstate the benefits of natural gas while understating its harms. When given full context, the darker reality of the natural gas industry becomes much harder to ignore.

### Natural Gas Companies Do More Than Passively Meet Demand

As outlined above, natural gas producers often explain their business model as satisfying consumers' demand for their product. In the words of the AGA, natural gas is an "essential component of a clean and secure energy portfolio" that will "heat our homes, run our vehicles, generate electricity and partner with renewable energy sources for decades to come."<sup>19</sup> But this framing ignores the lengths the industry has gone to prop up the market for natural gas.

In July 2019 Berkeley, California became the first city in the U.S. to institute a ban on using natural gas in new buildings.<sup>20</sup> The city cited three reasons for the ban: 1) reducing greenhouse gas emissions, 2) minimizing the risks from ruptured gas lines in the event of an earthquake, and 3) addressing concerns of indoor air pollution from natural gas stoves.<sup>21</sup> Since then, forty-two other cities and towns in California have enacted full or partial bans on natural gas in new buildings,<sup>22</sup> and the justifications for these bans are supported by substantial evidence.

Natural gas infrastructure is a public safety risk due to the high frequency of explosions, fires, and other incidents from gas pipelines. Between 2010 and 2018, there were 2,003 reported incidents caused by natural gas pipelines, causing 572 injuries, 116 deaths, and nearly \$1.5 billion in property damage.<sup>23</sup> One example of the risks posed by these pipelines occurred in September 2018 when an over-pressurized gas line ruptured, leading to between sixty and eighty fires, twenty-five injuries, and one death in Lawrence, Andover, and North Andover Massachusetts.<sup>24</sup>

While these fires and explosions are acute problems, the indoor air pollution caused by natural gas use in homes is a chronic, and even more dangerous, public health risk. Gas stoves produce particulate matter,

which can damage the lungs and exacerbate conditions like asthma and heart disease,<sup>25</sup> at twice the rate of electric stoves.<sup>26</sup> Gas stoves also regularly increase indoor concentrations of nitrogen oxides, carbon monoxide, and formaldehyde to levels that would violate federal air quality standards if found outdoors.<sup>27</sup> Because it is indoors, however, this air pollution is beyond the reach of EPA regulations. The health risk posed by this pollution is greatest for the most vulnerable populations, specifically children (who are naturally more susceptible to asthma and other air pollution-caused illnesses) and lower-income households (who live in smaller homes with worse ventilation).<sup>28</sup>

Given these health and safety concerns, and the natural gas industry's purported focus on supplying gas where there is demand, we might expect the industry to accept residential restrictions like Berkeley's and shift focus to other customers like power plants and factories. In fact, the exact opposite has happened, as the industry has fought back against the bans with fake grassroots campaigns and intense state-level lobbying.

For over a century, the natural gas industry has engaged in overt and covert marketing campaigns, typically targeted at women, to encourage the purchase of gas stoves for cooking.<sup>29</sup> In response to the recent movement to ban residential natural gas, the industry has stepped up its efforts to convince women that they want to cook with gas stoves rather than electric. The AGA and the American Public Gas Association have paid Instagram influencers to post pictures with captions talking up the benefits of natural gas stoves along with the hashtag "#CookingwithGas" while downplaying the concerns over indoor air pollution.<sup>30</sup> And industry efforts have gone beyond sponsoring content to create Astroturf campaigns, or organizing that is meant to appear like grassroots efforts but is actually industry-coordinated. For example, the gas utility SoCalGas created the front group Californians for Balanced Energy Solutions, which hired a public relations firm to advance its anti-electrification efforts.<sup>31</sup> The PR firm's employees then created fake accounts on the neighborhood social media app Nextdoor posing as neighbors to express their concern about proposed natural gas bans in different cities, and suggesting residents should speak out against the bans.<sup>32</sup>

In addition to being active on social media, gas companies and industry groups have been actively lobbying cities and towns to weaken or reject proposed gas bans, and asking state legislatures to block cities and towns from issuing natural gas bans entirely. City officials weakened proposed ordinances in Austin and San Antonio that would have

decreased natural gas use after the gas utilities began organizing opposition to the measures and proposing their own alternative ordinances.<sup>33</sup> In 2020, Louisiana, Oklahoma, Tennessee, and Arizona all passed laws prohibiting all local governments in the states from implementing ordinances that would ban natural gas connections like that in Berkeley.<sup>34</sup> These laws are driven by lobbying from industry groups like the Louisiana Mid-Continent Oil & Gas Association and the Petroleum Alliance of Oklahoma,<sup>35</sup> and similar bills have been introduced in at least a dozen other states.<sup>36</sup>

All of this is to say that natural gas companies do not operate as passive market participants, only seeking to supply the demand that exists. Instead, in a move reminiscent of tobacco companies, they are attempting to sustain and grow consumer demand for natural gas in the face of growing consensus that household gas use is a clear threat to public health and safety.<sup>37</sup>

## Natural Gas Worsens Climate Change and Harms Public and Private Lands

### *The Natural Gas “Bridge Fuel” Myth*

The argument from the natural gas industry that its product is a necessary tool in addressing global warming is an overly simplistic one that ignores important evidence. Natural gas consists primarily of methane. When burned, carbon dioxide is produced. This distinction is important because methane is estimated to be between thirty-four and eighty-six times more powerful as a greenhouse gas than carbon dioxide depending on the time frame of the estimate.<sup>38</sup> One recent study estimated that 2.3 percent of all-natural gas produced in the U.S. was leaking into the atmosphere before being burned.<sup>39</sup> Atmospheric methane concentrations have risen rapidly since 2007, and oil and gas production is believed to be a major contributor to this.<sup>40</sup> If just 3 percent of natural gas leaked throughout the drilling, processing, and transmission process, all climate benefits from replacing coal with gas for electricity production would be eliminated.<sup>41</sup>

Even if we accept the industry’s arguments that burning natural gas for electricity is better for the planet than burning coal, this framing ignores the fact that utilities have a wider array of cost-effective options for electricity generation today. While burning gas may release half the carbon dioxide of burning coal, renewable sources like solar and wind provide electricity without releasing any greenhouse gases. And utilities

aren't forced to absorb higher costs to use renewable sources rather than gas, as the cost of generating electricity from solar and wind is already below both natural gas and coal in many parts of the world, including the U.S.<sup>42</sup> Utilities and the natural gas industry, however, are still pushing for new natural gas power plants, arguing that they are necessary to provide reliability when wind turbines and solar panels aren't producing power.<sup>43</sup> This insistence on continuing to operate natural gas infrastructure, combined with the climate impacts of leakage, makes natural gas and the industries that rely on it a potent threat to the long-term health of the planet.

### *Natural Gas Companies Take Our Land for Their Private Gain*

Natural gas extraction and transmission has done immeasurable damage to public and private lands across the U.S. through abuse of the federal leasing system and of transmission companies' power of eminent domain for new pipelines. The Mineral Leasing Act, the statute discussed above that governs oil and gas leasing on federal lands, is an outdated law that gives excessive profits to gas producers. The law hasn't been updated since 1987 when Congress set the current minimum auction price of two dollars per acre of land leased to companies for oil and gas production.<sup>44</sup> In reality, these companies often don't even pay this minimum, as parcels that receive no bids during lease auctions are then offered through a non-competitive leasing process where companies are only required to pay low rental and royalty fees.<sup>45</sup> The current royalty rate of twelve-and-one-half percent is even older, having not been changed since the law was originally passed in 1920, and is well below the average royalty rate on state or private lands.<sup>46</sup> All of this means that gas producers can game the system by buying millions of acres worth of low-cost leases, often holding onto them for years before drilling, preventing that land from being used for other purposes and contributing little in the way of royalty fees to conservation efforts or other federal programs.

While natural gas companies are taking advantage of the Mineral Leasing Act's archaic leasing process to hoard leases of federal lands, the outdated language of the Natural Gas Act and the industry's capture of FERC has allowed pipeline developers to use the power of eminent domain to take land for pipeline projects with little oversight. While FERC is responsible for determining whether a proposed pipeline is within the public interest,<sup>47</sup> the agency expends little effort to reach this

conclusion. In the last twenty years, the agency has granted 1,021 certificates of public convenience to natural gas companies for proposed pipelines while rejecting only 6 applications.<sup>48</sup> One example of the absurdity of FERC's "public interest" determination is the Pacific Connector Pipeline. The pipeline would carry natural gas from Canadian wells 229 miles across the state of Oregon to a liquefied natural gas export facility—preapproved thanks to the authority granted by the Energy Policy Act of 2005—for sale in other countries.<sup>49</sup> This means that the pipeline wouldn't benefit American producers, and wouldn't serve American consumers, but would create massive profits for the private company operating the pipeline and export facility.<sup>50</sup> The FERC commissioners voted two-to-one to grant the permit for the project.<sup>51</sup>

FERC's capture by the natural gas industry goes even further, as the agency abused its own appeals process to prevent landowners from bringing lawsuits to protect their land. After granting a permit to a pipeline developer, the Natural Gas Act requires the agency to decide on any requests for rehearing the case within thirty days.<sup>52</sup> Only after FERC denies the rehearing request can aggrieved parties, like landowners whose property is being taken, bring a lawsuit to protect their rights.<sup>53</sup> The problem is that for years FERC has ignored their statutory requirements, instead issuing "tolling orders" that delay a decision on rehearing requests while preventing landowners from bringing a lawsuit.<sup>54</sup> Between 2008 and 2020, FERC issued a tolling order for every one of the 114 rehearing requests it received, and for 73 of those projects it allowed the company to start construction before making its rehearing decision.<sup>55</sup> FERC's use of tolling orders was recently halted by a decision from the D.C. Circuit, but the court's narrow holding still allows pipeline companies to take private land from being taken before the administrative and legal process ends.<sup>56</sup> All of this creates a system where landowners have little to no recourse, where pipeline developers can take someone's land and begin construction, often causing significant property damage along the way<sup>57</sup> before that person has a chance to exhaust their administrative and legal remedies.

## Natural Gas is Largely Unprofitable for Shareholders

The previous sections show how the natural gas industry has taken advantage of lax regulations, outdated laws, and captured agencies. These harms, from the direct health effects of indoor air pollution to corporate control of private and public land to global impacts from greenhouse gas emissions, would all fit in the traditional narrative of

corporations focused on their shareholders, not external stakeholders. But this shareholder primacy argument is wrong as well, as the natural gas industry has been unprofitable for over a decade and has done more to enrich the managers of these companies than provide returns to shareholders.

The price of natural gas collapsed in 2009 in response to decreased demand caused by the economic recession and increase supply from the rapid increase in shale gas fracking throughout the 2000s.<sup>58</sup> Despite industry expectations—or, more accurately, hopes—the price has not recovered from this fall in the twelve years since. In a 2012 report, the AGA predicted that wholesale natural gas prices would rise from \$2.50 per million BTUs at the time to nearly \$6.00 by 2021.<sup>59</sup> In reality, the market reached a price above \$6.00 one time during the winter of 2014, hasn't gone above \$4.50 since then, and has been below \$3.00 more often than it's been above it.<sup>60</sup> At the time of writing the price was \$2.73.<sup>61</sup>

These low prices have created huge losses for investors. A group of twenty-nine large natural gas production companies collectively lost \$181 billion between 2010 and 2018.<sup>62</sup> From 2015 to 2019 alone, 172 oil and gas production companies went bankrupt.<sup>63</sup> This trend continued with low energy demand caused by coronavirus lockdowns in 2020, with over 100 oil and gas companies going bankrupt.<sup>64</sup> And these losses aren't just limited to smaller producers. In 2019, Chevron, BP, Repsol, and Equinor collectively decreased the claimed value of their shale gas holdings, known as a write-off, by approximately \$22 billion.<sup>65</sup> In 2020, Exxon announced its largest write-off ever, cutting the claimed value of its natural gas holdings by between \$17 and \$20 billion.<sup>66</sup> Steve Schlotterbeck, the former CEO of the largest natural gas producer in the U.S., summarized the recent history of the industry bleakly: “The shale gas revolution has frankly been an unmitigated disaster for any buy-and-hold investor in the shale gas industry.... [T]he amount of shareholder value destruction registers in the hundreds of billions of dollars. The industry is self-destructive.”<sup>67</sup>

But despite these dismal returns for shareholders, the managers of these companies have been doing great. Between 2015 and 2019, while median returns to shareholders of large oil and gas companies fell 35 percent, CEO pay at those companies grew 31 percent.<sup>68</sup> The story is the same for the smaller independent producers, where between 2018 and 2021 total shareholder earnings fell 55 percent but CEOs were paid 138 percent of their target bonus salary.<sup>69</sup> One egregious example of this is Aubrey McClendon, the former CEO of Chesapeake Energy, who was given a seventy-five million dollar bonus in 2008 *after* the company's

value fell by eighty percent in six months.<sup>70</sup> McClendon's successor has made \$110 million over the past 7 years while the company's value has fallen 99%.<sup>71</sup> Collectively, these figures undercut the idea that the harmful externalities discussed above are driven by corporations' obligations to maximize shareholder value. Instead, the executives of these companies are extracting value at the expense of people and the planet to line their own pockets. In doing so, they have found a way to violate both their moral obligations to society and their legal obligations to their shareholders.

## CONCLUSION

The natural gas industry has been a destructive force in the U.S. over the past twenty years. Its companies are poisoning the air in our homes while paying Instagram influencers to tell us everything is fine. They are destroying public and private lands across the country with the help of federal agencies that have long been captured by these private interests. And they are worsening climate change while fighting against meaningful regulations to reverse this. All of this might be defensible under the traditional corporate law model if the industry benefited shareholders, but even that is not the case. Overproduction that far outstrips demand has meant rock-bottom prices for natural gas that have cost investors billions of dollars and driven hundreds of companies bankrupt. The one group of beneficiaries is the managers of these companies, who have managed to look past this destruction to fill their own coffers year after year regardless of their ability to produce benefits for any other stakeholders. No matter what view you take of corporate law, from the narrow view of shareholder primacy above all else to the broader view of taking into account the impact on a wider array of stakeholders, the natural gas industry is a failure. As we hopefully shift away from fossil fuel use altogether over the coming decades, this extractivist corporate model deserves to be left in the past.

## ENDNOTES

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<sup>3</sup> ATLANTIC COAST PIPELINE, POWERING THE FUTURE 3, <https://atlanticcoastpipeline.com/resources/docs/resources/acp-factbookversion2.pdf>.

<sup>4</sup> *Id.* at 4. No citation was provided for this claim, and it wasn't clear whether this was a nationwide or regional increase. *Id.* (Citing ICF INTERNATIONAL, THE ECONOMIC IMPACTS OF THE ATLANTIC COAST PIPELINE 6 (2015)).

<sup>5</sup> *Id.* at 5.

<sup>6</sup> *Economy*, AMERICAN GAS ASSOC., <https://www.aga.org/policy/economy/>.

<sup>7</sup> Matt Stieb, *What Texas Governor Greg Abbot Gets Wrong About his State's Power Failures*, N.Y. INTELLIGENCER (Feb. 17, 2021), <https://nymag.com/intelligencer/2021/02/what-gov-greg-abbott-gets-wrong-about-texas-power-failures.html>.

<sup>8</sup> AMERICAN GAS ASSOC., CLIMATE CHANGE POSITION STATEMENT 1, <HTTPS://WWW.AGA.ORG/POLICY/ENVIRONMENT/?P=6>.

<sup>9</sup> *Carbon Dioxide Emissions Coefficients*, ENERGY INFO. ADMIN. (Feb. 2, 2016), [https://www.eia.gov/environment/emissions/co2\\_vol\\_mass.php](https://www.eia.gov/environment/emissions/co2_vol_mass.php).

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<sup>12</sup> Kate Kelly et al., *Backroom Deals: The Hidden World of Noncompetitive Oil and*

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*Gas Leasing*, CTR. FOR AM. PROGRESS (May 23, 2019), <https://www.americanprogress.org/issues/green/reports/2019/05/23/470140/backroom-deals/>.

<sup>13</sup> 30 U.S.C. §226(b)(1)(B), (b)(2)(A).

<sup>14</sup> Connor Bailey et al., *America's Public Lands Giveaway*, THE WILDERNESS SOC., THE CTR. FOR WESTERN PRIORITIES (April, 2020), <https://storymaps.arcgis.com/stories/36d517f10bb0424493e88e3d22199bb3>.

<sup>15</sup> Mark Green, *The Case For Permanent LWCF Funding – In Pictures And Words*, AMERICAN PETROLEUM INST. (July 22, 2020), <https://www.api.org/news-policy-and-issues/blog/2020/07/21/the-case-for-permanent-lwcf-funding-in-pictures-and-words>.

<sup>16</sup> CHARLES BLANCHARD, *THE EXTRACTION STATE 60* (2020).

<sup>17</sup> An Act to amend the Natural Gas Act, Pub. L. No. 80-245, 61 Stat. 459, 459 (1947) (codified at 15 U.S.C. §717f(h); *see also* Eric N. Holmes, CONG. RSCH. SERV., LSB10359, *THIS LAND IS YOUR LAND? EMINENT DOMAIN UNDER THE NATURAL GAS ACT AND STATE SOVEREIGN IMMUNITY 1* (2019).

<sup>18</sup> 15 U.S.C. §717b(c).

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<sup>20</sup> Susie Cagle, *Berkeley became first US city to ban natural gas. Here's what that may mean for the future*, THE GUARDIAN (July 23, 2019), <https://www.theguardian.com/environment/2019/jul/23/berkeley-natural-gas-ban-environment>.

<sup>21</sup> BERKELEY MUNI. CODE §12.80.010; *see also* Lauren Sommer, *Trade In Your Gas Stove to Save the Planet? Berkeley Bans Natural Gas*, KQED (Sep. 24, 2019), <https://www.kqed.org/science/1945656/trade-in-your-gas-stove-to-save-the-planet-berkeley-bans-natural-gas>.

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<sup>24</sup> *Id.*

<sup>25</sup> *Fine Particles (PM 2.5) Questions and Answers*, New York State Dept. Health, [https://www.health.ny.gov/environmental/indoors/air/pm2\\_5.htm](https://www.health.ny.gov/environmental/indoors/air/pm2_5.htm). PM2.5 is particulate matter with a diameter of 2.5 microns or less. *Id.*

<sup>26</sup> HU ET AL., OFFICE OF SCI. AND TECH. INFO., *DEVELOPING PM2.5 EMISSION INVENTORIES FOR ASSESSING RESIDENTIAL AIR POLLUTION EXPOSURE TO PERIODIC AND*

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<sup>27</sup> BRADY ANNE SEALS ET AL., ROCKY MOUNTAIN INST. ET AL., HEALTH EFFECTS FROM GAS STOVE POLLUTION 8–11 (2020), <https://rmi.org/insight/gas-stoves-pollution-health>.

<sup>28</sup> *Id.* at 12–14.

<sup>29</sup> Rebecca Leber, *How the Fossil Fuel Industry Convinced Americans to Love Gas Stoves*, MOTHER JONES (Feb. 11, 2021), <https://www.motherjones.com/environment/2021/02/how-the-fossil-fuel-industry-convinced-americans-to-love-gas-stoves/>.

<sup>30</sup> *Id.* See also Rebecca Leber, *The Gas Industry is Paying Instagram Influencers to Gush Over Gas Stoves*, MOTHER JONES (June 17, 2020), <https://www.motherjones.com/environment/2020/06/gas-industry-influencers-stoves/>.

<sup>31</sup> See Leber, *supra* note 29.

<sup>32</sup> *Id.*

<sup>33</sup> Emily Holden, *A Texas city had a bold new climate plan – until a gas company got involved*, THE GUARDIAN (Mar. 1, 2021), <https://www.theguardian.com/us-news/2021/mar/01/a-texas-city-had-a-bold-new-climate-plan-until-a-gas-company-got-involved>.

<sup>34</sup> Emily C. Dooley & Jennifer Kay, *Pro-Gas States Pass Laws Barring natural Gas Bans, Limits (1)*, BLOOMBERG LAW (May 27, 2020), [https://www.bloomberglaw.com/bloomberglawnews/environment-and-energy/X2EMBRGG000000?bna\\_news\\_filter=environment-and-energy#jcite](https://www.bloomberglaw.com/bloomberglawnews/environment-and-energy/X2EMBRGG000000?bna_news_filter=environment-and-energy#jcite).

<sup>35</sup> *Id.*

<sup>36</sup> Holden, *supra* note 33.

<sup>37</sup> See Leber, *supra* note 29.

<sup>38</sup> Tarika Powell, *Methane’s 20- and 100-Year Climate Effect is Like ‘CO2 On Steroids’*, SIGHTLINE INST. (Feb 12, 2019), <https://www.sightline.org/2019/02/12/methane-climate-change-co2-on-steroids/>.

<sup>39</sup> Anthony J. Marchese & Dan Zimmerle, *The U.S. natural gas industry is leaking way more methane than previously thought*, PBS NEWS HOUR (July 4, 2018), <https://www.pbs.org/newshour/science/the-u-s-natural-gas-industry-is-leaking-way-more-methane-than-previously-thought>.

<sup>40</sup> See *Global CH<sub>4</sub> Monthly Means*, GLOBAL MONITORING LAB’Y, [https://www.esrl.noaa.gov/gmd/ccgg/trends\\_ch4/](https://www.esrl.noaa.gov/gmd/ccgg/trends_ch4/) (showing the spike in atmospheric methane levels since 2007); Jonah M. Kessel & Hiroko Tabuchi, *It’s a Vast, Invisible Climate Menace. We Made It Visible*, N.Y. TIMES (Dec. 12, 2019), <https://www.nytimes.com/interactive/2019/12/12/climate/texas-methane-super-emitters.html>.

<sup>41</sup> Marchese & Zimmerle, *supra* note 39

<sup>42</sup> Simon Evans & Josh Gabbitiss, *Solar is now 'cheapest electricity in history', confirms IEA*, CARBONBRIEF (Oct. 13, 2020), <https://www.carbonbrief.org/solar-is-now-cheapest-electricity-in-history-confirms-iea>.

<sup>43</sup> Ivan Penn, *The Next Energy Battle: Renewables vs. Natural Gas*, N.Y. TIMES (July 6, 2020), <https://www.nytimes.com/2020/07/06/business/energy-environment/renewable-energy-natural-gas.html>.

<sup>44</sup> Bailey et al., *supra* note 14.

<sup>45</sup> Kelly et al, *supra* note 12. Royalties are paid on the revenue earned by the producer for selling any oil and gas they extract.

<sup>46</sup> Bailey et al., *supra* note 14.

<sup>47</sup> 15 U.S.C. §717f(c)(1)(A).

<sup>48</sup> *Subcommittee Release Preliminary Findings Showing FERC Pipeline Approval Process Skewed Against Landowners*, HOUSE COMM. ON OVERSIGHT AND REFORM (Apr. 28, 2020), <https://oversight.house.gov/news/press-releases/subcommittee-releases-preliminary-findings-showing-ferc-pipeline-approval>.

<sup>49</sup> Lee van der Voo, *It's His Land. Now a Canadian Company Gets to Take it.*, PROPUBLICA (Oct. 1, 2020), <https://www.propublica.org/article/its-his-land-now-a-canadian-company-gets-to-take-it>.

<sup>50</sup> The developers said that it would eventually offer to export gas produced in the U.S., but they made no firm commitment to do so. *Id.*

<sup>51</sup> *Id.*

<sup>52</sup> 15 U.S.C. §717r(a).

<sup>53</sup> Niina H. Farah, *Landmark court ruling could spur FERC 'sea change'*, E&E NEWS (July 1, 2020), <https://www.eenews.net/energywire/stories/1063483913>.

<sup>54</sup> Jeremy Dillon, *Report: FERC puts developers over landowners*, E&E NEWS (Apr. 28, 2020), <https://www.eenews.net/greenwire/stories/1062995715/>.

<sup>55</sup> *Id.*

<sup>56</sup> Farah, *supra* note 53.

<sup>57</sup> Mike Soraghan, *Angry Okla. Farmers fight pipeline builder – and FERC*, E&E NEWS (Mar. 15, 2021), <https://www.eenews.net/energywire/2021/03/15/stories/1063727417>.

<sup>58</sup> See Clifford Krauss, *Natural Gas Prices Plummet to a Seven-Year low*, N.Y. TIMES (Aug. 20, 2009), <https://www.nytimes.com/2009/08/21/business/energy-environment/21gas.html>; Sharon Kelly, *Former Shale Gas CEO Says Fracking*

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<sup>59</sup> AMERICAN GAS ASSOC., *THE PROMISE OF NATURAL GAS 3* (2012), [https://www.aga.org/sites/default/files/legacy-assets/our-issues/promise/Documents/AGA\\_MeetingBrochure\\_VER9.pdf](https://www.aga.org/sites/default/files/legacy-assets/our-issues/promise/Documents/AGA_MeetingBrochure_VER9.pdf).

<sup>60</sup> *Natural Gas*, NASDAQ, <https://www.nasdaq.com/market-activity/commodities/ng%3Anmx> (last accessed Apr. 22, 2021).

<sup>61</sup> *Id.*

<sup>62</sup> Kelly, *supra* note 58.

<sup>63</sup> *Id.*

<sup>64</sup> Paul Takahasi, *Over 100 oil and gas companies went bankrupt in 2020*, HOUSTON CHRONICLE (Jan. 20, 2021), <https://www.houstonchronicle.com/business/energy/article/More-than-100-oil-and-gas-companies-filed-for-15884538.php>.

<sup>65</sup> Shanti S. Nair, *Chevron’s charge points to billions more in U.S. gas writedowns: analysts*, REUTERS (Dec. 11, 2019), <https://www.reuters.com/article/us-chevron-outlook-natgas/chevrons-charge-points-to-billions-more-in-u-s-gas-writedowns-analysts-idUSKBN1YF1WW>.

<sup>66</sup> Jennifer Hiller, *Exxon tries to put the worst behind it with \$20 billion writedown*, REUTERS, (Nov. 30, 2020), <https://www.reuters.com/article/us-exxon-mobil-outlook/exxon-tries-to-put-the-worst-behind-it-with-20-billion-writedown-idUSKBN28A31I>.

<sup>67</sup> Kelly, *supra* note 58.

<sup>68</sup> Collin Eaton, *Shale Companies Had Lousy Returns. Their CEOs Got Paid Anyways*, WALL STREET J. (Oct. 2, 2020), <https://www.wsj.com/articles/shale-companies-had-lousy-returns-their-ceos-got-paid-anyway-11601631002>.

<sup>69</sup> Myles McCormick, *U.S. energy CEOs are awarding themselves millions in bonuses as their companies go bankrupt*, FINANCIAL TIMES (Jan. 10, 2021), <https://financialpost.com/commodities/energy/u-s-energy-ceos-are-awarding-themselves-millions-in-bonuses-as-their-companies-go-bankrupt>.

<sup>70</sup> *Settlement in Chesapeake Energy Derivative Action: CEO keeps \$75 Million Bonus, But Agrees to Buy Back \$12 Million Art Collection*, PORTER WRIGHT (Nov. 3, 2011), <https://www.fedseclaw.com/2011/11/articles/shareholder-news/settlement-in-chesapeake-energy-derivative-action-ceo-keeps-75-million-bonus-but-agrees-to-buy-back-12-million-art-collection/>.

<sup>71</sup> McCormick, *supra* note 69.