UNCAPTURED: THE CCUS BOOM, ENVIRONMENTAL JUSTICE, AND CANCER ALLEY

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ABSTRACT

This article exposes the environmental justice implications of industrialization-as-climate-mitigation strategies by focusing on their effects on minority communities in south Louisiana. Political and economic forces at the federal and state levels are advocating for increased development of carbon capture utilization and storage systems that will likely retrench Louisiana's toxic fossil fuel infrastructure. Though these projects increase pollution, they leverage industrial development subsidies or under the guise of environmental justice efforts. But, a greater harm is at play: history shows that the air and water pollution byproducts of these developments are distributed in Louisiana's minority communities, and there is intention to end these unfair and harmful government supported practice. This essay argues that even if new environmental technology works as intended, new carbon capture systems will in fact increase the burden of environmental harm borne by minority communities while corporations reap large tax benefits. This paper provides two solutions that policymakers should consider address the broader environmental justice implications of new industries and systems and to fulfill promises made by the Biden administration in its environmental justice commitments. First, legislatures must rethink the 45Q tax credit and related subsidies so that they cannot be manipulated to harm the environment or minority communities under the guise of environmental justice. Second, environmental justice policies must be implemented within permitting agencies such that

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consideration is given to the relative environmental justice burdens created by permit holders who produce hazardous waste and pollution and to deny permits on the basis that their actions will disproportionately burden racial minorities or low-income populations.

INTRODUCTION

In the spring of 2023, the Louisiana legislature considered two bills that would restrict the conducting of carbon sequestration operations on environmentally-sensitive Lake Maurepas – one an outright ban and the other requiring an environmental impact statement before any permit would be granted.[1] In an effort to defeat those bills, lobbyists for Air Products – a company seeking to construct a sequestration well under Lake Maurepas – sent a text to legislators that read in part, "Furthermore, the bills seek to keep carbon capturing in predominantly black areas."[2]

This characterization deserves to be placed in context and examined as a cynical weaponization of long-running battles over environmental justice in Louisiana, including in the state's "Cancer Alley" – the industrialized corridor that runs along the Mississippi River between Baton Rouge and New Orleans.[3] In fact, the Air Products proposal – a "blue ammonia" manufacturing facility – would increase toxic air emissions in a heavily industrialized and disproportionately-Black part of Ascension Parish,[4] while claiming to capture 95% of the carbon dioxide emissions from the facility and piping them miles away to a sequestration well on Lake Maurepas.[5]

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1. *See* H.B. 267, 2023 Leg., Reg. Sess. (La. 2023); H.B. 308, 2023 Leg., Reg. Sess. (La. 2023).

2. Sam Karlin (@SamKarlin), TWITTER (May 17, 2023, 8:21 AM), https://twitter.com/samkarlin/status/1658825012499869698 [https://perma.cc/G759-XS8X].

3. Hereinafter referred to as the "Industrial Corridor" or "Cancer Alley." The term "Cancer Alley" as used to describe this area of Louisiana likely originated sometime in the mid-1980s. One source places the origin with unionized workers at the BASF plant in Geismar, Louisiana, who put up billboards during a lockout that used the moniker. *See* GERALD MARKOWITZ & DAVID ROSNER, DECEIT AND DENIAL: THE DEADLY POLITICS OF INDUSTRIAL POLLUTION 247 (2002).

4. The area—a 5-mile radius around the proposed Air Products site—is in the 99th percentile for toxic releases to air and is 42% Black and 4% multiracial. EJScreen Report, infra note 120.. The population of Louisiana as a whole is 32.8 % Black and 1.9% two or more races. *QuickFacts: Louisiana*, U.S. CENSUS BUREAU (2022), https://www.census.gov/quickfacts/fact/table/LA/PST045222 [https://perma.cc/JD4N-PWJD].

5. *See* Laura Nicholson, Drilling beings this month for what could be the world's largest carbon capture project, ADVOCATE (Aug. 6, 2023), https://www.theadvocate.com/baton_rouge/news/environment/air-products-to-drill-injection-well-in-lake-maurepas/article_d95ab5a8-33cc-11ee-ab81-dfbf12b0b21f.html [https://perma.cc/NWA7-HUJS]

The Air Products proposal is just one of several "blue" ammonia or hydrogen projects announced for Louisiana over the last two years,[6] and one of many carbon capture, utilization, and storage proposals ("CCUS") (which cover a broader scope of direct air capture ("DAC") and projects capturing carbon emissions from existing sources). Projects like these play an integral role in Louisiana's ambitious Climate Action Plan and in the nation's overall strategy to address greenhouse gas ("GHG") emissions from industrial sources. They also receive massive subsidies from the federal government, increased by the Inflation Reduction Act of 2022.[7] But they also mean increased industrialization and the accompanying harmful air emissions that go uncaptured by the CCUS process. These knock-on effects could not only undermine the goal of addressing climate change, but also impose further burdens on environmental justice communities.

Since the 1909 construction of the first oil refinery in Baton Rouge, on the lower Mississippi River, various political and economic forces have subsidized the development of the chemical industry along the Louisiana's Industrial Corridor, from a government takeover of flood protection along the river to generous tax exemptions for manufacturing.[8] With the development and entrenchment of the chemical industry has also come resistance from the existing communities affected by the accompanying pollution.[9] Now these communities may face another wave of industrial development subsidized by government policy.[10]

There is something darkly ironic about heavy industry embracing methods to mitigate the climate crisis—whether their intentions are sincere or are a cynical claim on new government financial incentives—that will intensify the environmental burdens of more "traditional" air pollution and their distribution on minority communities. This essay seeks to expose the environmental justice implications of this industrialization-as-climate-mitigation strategy by focusing on existing environmental justice communities in south Louisiana.

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6. "Blue hydrogen" refers to hydrogen produced from natural gas with the addition of carbon capture and sequestration technology. WHITE HOUSE ENVIRONMENTAL JUSTICE ADVISORY COUNCIL CARBON MANAGEMENT WORKGROUP,WHITE HOUSE ENVIRONMENTAL JUSTICE ADVISORY COUNCIL RECOMMENDATIONS: CARBON MANAGEMENT WORKGROUP xi (2023) (Hereinafter WHEJAC).

7. *See* Inflation Reduction Act of 2022, Pub. L. No. 117-169, § 13104, 136 Stat. 1924–28.

8. *See infra* Part I.

9. *See infra* Part I.

10. *See* discussion *infra* Parts II.b. and III.a.

To that end, Part I will provide a brief history and current overview of south Louisiana's existing environmental justice communities that will be affected by the development of different CCUS proposals. Part II will examine the political and economic forces at the federal and state levels that have sparked the recent boom in proposed CCUS projects. Part III will explore the potential implications of the CCUS boom on those communities. This essay argues that even if the technology works as intended, not all CCUS proposals are created equal, and some will in fact increase the burden of environmental harm borne by minority communities. To address this, the federal government should rethink its subsidies for CCUS and craft permitting requirements that incorporate fair treatment and meaningful consideration of these environmental justice communities.

I. "CANCER ALLEY:" A GEOGRAPHY OF FOSSIL FUEL RACISM AND RESISTANCE

In 1909, Standard Oil built its first refinery on the bluffs north of Baton Rouge, Louisiana, on land subdivided from a cotton plantation.[11] Over the next several decades, a handful of new refineries and chemical manufacturing plants cropped up along the Mississippi River between Baton Rouge and New Orleans.[12] Like the Standard Oil refinery, future heavy industry purchased former plantation sites for their operation.[13] This land provided access to the river's incomparable transportation network[14] and the levee system, as they did for the previous sugarcane and cotton production.

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11. *See* Craig E. Colten, *Making A Lemon Out of Lemonade: Louisiana's Petrochemical Corridor*, *in* ENERGY CAPITALS: LOCAL IMPACT, GLOB. INFLUENCE 58, 63 (Joseph A. Pratt et al. eds., 2014).

12. *See* ADAM MANDELMAN, THE PLACE WITH NO EDGE: AN INTIMATE HISTORY OF PEOPLE, TECHNOLOGY, AND THE MISSISSIPPI RIVER DELTA 136–37 (2020).

13. *See id.* at 138 ("When early-twentieth century competition from both domestic sugar beets and international cane growers drove down sugar prices, bankrupt planters found in the chemical industry ready buyers for their leveed and well-drained lands."); *see also* J. TIMMONS ROBERTS & MELISSA M. TOFFLON-WEISS, CHRONICLES FROM THE ENVIRONMENTAL JUSTICE FRONTLINE 34 (2001); BARBARA L. ALLEN, UNEASY ALCHEMY: CITIZENS AND EXPERTS IN LOUISIANA'S CHEMICAL CORRIDOR DISPUTES 13 (Robert Gottlieb ed., 2003) ("When the chemical companies arrived in the last half of the twentieth century, they purchased large plantations from wealthy white former-planer families for their operations"); Craig E. Colten, *An Incomplete Solution: Oil and Water in Louisiana*, 99 J. AM. HIST. 91, 93 (June 1, 2012).

14. *Id.*

The Mississippi River drains a vast swath of the continent, and prior to the development of man-made flood protection, spring flooding regularly occurred along the lower river.[15] Before the establishment of the Mississippi River Commission (MRC) in 1879, the construction of levees along the river's banks remained the responsibility of private landowners, resulting in the piecemeal development of levees along the lower river that did not keep the flooding at bay.[16] The MRC, an arm of the federal government, "gradually oversaw the construction of an improved levee system by 1926" – just in time for the flood of 1927.[17] This flood prompted the development of a "levees and outlet" approach by the MRC and the U.S. Army Corps of Engineers.[18] "By 1960, over $1.5 billion had been invested in these alternations. According to Corps of Engineers' estimates, fending off the floods between 1927 and 1960 prevented some $5 billion in property damage."[19] Though rarely discussed as such, these investments constitute a huge federal subsidy for the development of the petrochemical industry along the lower Mississippi River.[20]

And industry would also enjoy significant support from Louisiana's state government.[21] In 1936, Louisiana enacted the first version of its Industrial Tax Exemption Program. Act 68 of 1936 allowed the Governor and the Board of Commerce and Industry to exempt any new industrial facilities or expansions of existing facilities from all taxes.[22] The demand for fuel, rubber, and other products created by the U.S.'s entry into World War II also spurred the expansion of existing facilities and construction of new ones along the Industrial Corridor.[23] After the war, labor organizing drives at Dow facilities in Texas and the generous tax incentives provided by Louisiana helped induce the migration of the petrochemical industry to Louisiana.[24] Geographer Craig E. Colten notes that, by 1974, petrochemical

15. *See* Colten, *supra* note 11, at 60.
16. *Id.* at 60.
17. *Id.* at 61–62.
18. *Id.* at 62.
19. *Id.*
20. *Id.* at 63.
21. S.B. 39, 1936 Leg., Reg. Sess. (La. 1936), *available at* https://babel.hathitrust.org/cgi/pt?id=uc1.b3683180&seq=897 [https://perma.cc/4GGQ-SPMY].
22. *Id.* The exemption was again codified in Louisiana's 1974 Constitution, where it still exists. LA. CONST. art. VI, § 21(F).
23. Mandelman, *supra* note 12, at 137.
24. MARKOWITZ & ROSNER, *supra* note 3, at 239–40.

and power-generating industry accounted for 83% of investment that qualified for Louisiana's generous industrial tax exemption.[25] The state's lax environmental laws also acted as an effective subsidy for industry, allowing discharges into the Mississippi River largely unabated.[26] In Ascension Parish alone, at least seven heavy industrial facilities opened between 1960 and 1970, including Rubicon and Shell Chemical.[27]

Residents of the Industrial Corridor began a public backlash against industry and its accompanying pollution in the 1970s. In 1978, the death of a young truck driver—Kirtley Jackson—from exposure to the hazardous waste he was hauling brought further public attention to the hazardous wastes generated by industry and disposed of near communities.[28] The next year, a proposal to construct a massive hazardous waste disposal facility in Burnside, Louisiana, brought the local community together in a long-running campaign of resistance that resulted in the most seminal environmental case in Louisiana, *Save Ourselves, Inc. v. Louisiana Control Commission.*[29] In addition to defining the state government's duty to protect human health and the environment, *Save Ourselves* resulted in the ultimate defeat of the construction project.[30] The *Save Ourselves* court required that before a Louisiana state agency could issue environmental permits, said agency must "determine that adverse environmental impacts have been minimized or avoided as much as possible consistently with the public welfare."[31] A later case, *Blackett v. La. Dept. of Envt'l Quality*, clarified this duty as requiring, in part, the examination of "the potential and real adverse environmental effects of the proposed facility," a weighing of the economic and social benefits against the environmental costs, and a consideration of

25. Colten, *supra* note 11, at 67.

26. *Id*.

27. BARBARA L. ALLEN, UNEASY ALCHEMY: CITIZENS AND EXPERTS IN LOUISIANA'S CHEMICAL CORRIDOR DISPUTES 13 (Robert Gottlieb ed., 2003). The Rubicon facility in Geismar also boasts a notably poor record for worker exposure to toxic chemicals, with 25 incidents of such exposure in the last decade. Mark Schleifstein, *Work Exposure to Dangerous Chemicals at Rubicon Plant in Geismar Linked to Poor Maintenance Record*, NOLA.COM (Jan. 21, 2021), https://www.nola.com/news/environment/worker-exposure-to-dangerous-chemicals-at-rubicon-plant-in-geismar-linked-to-poor-maintenance-record/article_3cffa794-5f1e-11ea-b203-4b0f231b21a8.html [https://perma.cc/9JW2-6AXM].

28. ROBERTS & TOFFLON-WEISS, *supra* note 13, at 36.

29. *See* Oliver A. Houck, *Save Ourselves: The Environmental Case That Changed Louisiana*, 72 LA. L. REV. 409, 409–10 (2012).

30. *See id.* at 425–39.

31. Save Ourselves, Inc. v. La. Envt'l Control Com'n, 452 So.2d 1152, 1157 (La. 1984).

alternative sites and mitigating measures that might offer greater protection to the environment than the proposal.[32]

Throughout the 1980s, 1990s, and early 2000s, the Corridor saw flashpoints of local resistance to both existing and proposed new industrial facilities. While a full exploration of the environmental justice movement in Cancer Alley is beyond the scope of this essay, a few key moments are worth mentioning in light of the new wave of proposed facilities incorporating CCUS. In 1988, community activists joined organizations like Greenpeace and the Sierra Club for the inaugural "Louisiana March Against Toxics," to protest toxic pollution.[33] The late 1990s and early 2000s brought the battle over the proposed Shintech polyvinyl chloride plant in a majority-Black district of St. James Parish, which led to the EPA's intervention and the ultimate defeat of the proposal.[34]

Another wave of both new industrialization and community resistance to said heavy industry cropped up again in the 21st century. The fracking boom, including the 2008 discovery in the Haynesville shale gas field,[35] caused a drop in natural gas prices—a key component of much chemical manufacturing.[36] David Dismukes, a professor of energy economics at Louisiana State University, refers to this as the "industrial renaissance in

32. 506 So.2d 748, 753–54 (La. App. 1 Cir. 1987).

33. Roberts & Tofflon-Weiss, *supra* note 13, at 44–45.

34. *See* Robert R. Kuehn, *Denying Access to Legal Representation: The Attack on the Tulane Environmental Law Clinic*, 4 WASH. U. J.L. & POL'Y 33, 38–40, 50–51 (2000).

35. Information about the Haynesville Shale, NAT. GAS INTEL., https://www.naturalgasintel.com/information-about-the-haynesville-shale/ [https://perma.cc/P4EN-2GRW] (last accessed Nov. 27, 2023) ("The play was discovered by Chesapeake Energy in early 2008, and that triggered a substantial wave of leasing activity in the area."); *see also Boom Times at the Haynesville Shale*, FORBES (June 5, 2009), https://www.forbes.com/2009/06/05/natural-gas-haynesville-shale-business-energy-haynesville.html?sh=44c08840455d [https://perma.cc/8BG8-AKQ2].

36. David E. Dismukes, *Unconventional Resources and Louisiana's Manufacturing Development Renaissance*, LSU CTR. FOR ENERGY STUD., Jan. 18, 2013, at 5 ("[S]hale plays … are the primary reason for the decrease in overall and regional natural gas prices."), *available at* https://www.lsu.edu/ces/presentations/2013/Dismukes_BR-PRESS-CLUB-PRESENTATION-1.pdf. "Louisiana's chemical industry, in particular, uses natural gas in a range of applications that include the generation of heat, steam, and power. Feedstock uses are equally important and are the building blocks of modern petrochemical manufacturing." *Id.* at 5; *see also* Gary Wagner and Stephen Barnes, *The Economy of Louisiana*, *in* THE PARTY IS OVER: THE NEW LOUISIANA POLITICS 158 (Pearson Cross & Christie L. Maloyed, eds., 2022) (Since 2010, capital investments in the state tied to low-cost and abundant natural gas, which is the primary feedstock of chemical manufacturing, are rapidly approaching the $100 billion mark.").

Louisiana."[37] From 1988-2017, the number of facilities in Louisiana reporting toxic releases to the national Toxics Release Inventory increased from 255 to 320.[38] From 2015-2019, seven new major industrial plants in the Corridor received the necessary permits to start construction.[39] In January 2020, the Louisiana Department of Environmental Quality ("LDEQ") issued Clean Air Act permits for the Formosa Plastics "Sunshine Project," a plastics manufacturing megacomplex to be located in St. James Parish.[40] All told, about 150 heavy industrial facilities now sit along the Mississippi River from Baton Rouge to New Orleans.[41]

This recent expansion of industrial development in the Corridor also renewed resistance movements against both new and existing facilities. In 2010, the EPA released a risk assessment that concluded that chloroprene—emitted in large quantities by a single facility in St. John the Baptist Parish, Denka Performance Elastomers—was much more carcinogenic than previously thought.[42] In 2015, the EPA also determined that chloroprene emissions from Denka were much higher than previously thought.[43] This sparked the formation of Concerned Citizens of St. John, a community group that has gone to tremendous lengths to force Denka, LDEQ, and the EPA to address the chloroprene emissions from the facility, even going so far as to travel to Denka's headquarters in Japan to demand that the company

37. David E. Dismukes, *Louisiana 2021 Greenhouse Gas Inventory. Appendix 1: Combustion of fossil fuels emissions estimates*, LSU CTR. FOR ENERGY STUD. 15 (Oct. 2021), *available at* https://www.lsu.edu/ces/publications/2021/louisiana-2021-greehouse-gas-inventory-df-rev_reduced.pdf [https://perma.cc/G2NX-C57G].

38. Lylla Younes, *Why Louisiana's Air Quality is Going From Bad to Worse in 3 Charts*, PROPUBLICA (Oct. 30, 2019, 12:00 PM), https://www.propublica.org/article/why-louisianas-air-quality-is-going-from-bad-to-worse-in-3-charts [https://perma.cc/R7MM-LGQZ].

39. Lylla Younes, Al Shaw, and Claire Perlman, *In a Notoriously Polluted Area of the Country, Massive New Chemcial Plants Are Still Moving In*, PROPUBLICA (Oct. 30, 2019), https://projects.propublica.org/louisiana-toxic-air/ [https://perma.cc/DL97-KF7T].

40. Joshua Rosenberg, *Court vacates permits for proposed $9.4 billion petrochemical plant in state's Chemical Corridor*, THE LENS (Sept. 15, 2022), https://thelensnola.org/2022/09/15/court-vacates-permits-for-proposed-9-4-billion-petrochemical-plant-in-states-chemical-corridor/ [https://perma.cc/J9AA-CXYT].

41. Mandelman, *supra* note 12, at 137. Another source estimates that there are 200 facilities in the seven parishes along the river between Baton Rouge and New Orleans that "emit toxic chemical as a high enough level that they must report their emissions to the government." Younes, *supra* note 39.

42. *LaPlace, Louisiana - Frequent Questions*, EPA, https://www.epa.gov/la/laplace-louisiana-frequent-questions [https://perma.cc/8WYU-VYZ8] (last visited Aug. 29, 2023).

43. *LaPlace, Louisiana - Background Information*, EPA, https://www.epa.gov/la/laplace-louisiana-background-information [https://perma.cc/TY4V-72WL] (last visited Aug. 30, 2023).

reduce emissions at the plant.[44] In 2022, residents of St. James Parish and environmental groups successfully challenged LDEQ's issuance of the air permits for the Formosa Plastics megacomplex, halting, for the time being, the construction of a new petrochemical facility that would double the emissions of toxic air pollutants in the area and emit 13 million tons per year of GHGs.[45]

Despite assurances by LDEQ that emissions of harmful air pollutants in Louisiana have decreased in recent years,[46] a survey of the available data shows that communities still face a dangerous situation.[47] As of the 2021 Toxics Release Inventory, Louisiana boasts the greatest number of toxic air releases in the United States;[48] more than 50 million pounds of toxic pollutants were released into the air in 2021 alone,[49] just edging out Texas, which released 50.1 million pounds.[50] One recent study found that cancer incidence in Louisiana correlates with higher cancer risk from toxic air pollution in Black and low-income communities.[51] Another concluded that the state of Louisiana "has permitted a pattern of industrialization wherein

44. *See* Julie Dermansky, *Louisiana's Cancer Alley Residents Take the Fight for Environmental Justice on the Road*, DESMOG (July 8, 2019, 6:17 PM), https://www.desmog.com/2019/07/08/louisiana-cancer-alley-environmental-justice-dc-tokyo/ [https://perma.cc/LH49-6JZJ].

45. *See* Rosenberg, *supra* note 40; David Mitchell, *For massive new plants, Formosa wants OK to double amount of chemicals released in St. James Parish air*, ADVOCATE (July 19, 2019). https://www.theadvocate.com/baton_rouge/news/for-massive-new-plants-formosa-wants-ok-to-double-amount-of-chemicals-released-into-st/article_c30d4620-a1be-11e9-837c-13f09466bb79.html#:~:text=Formosa%20is%20proposing%2014%20separate,pounds%20to%203.2%20million%20pounds [https://perma.cc/6LKL-H42X].

46. *See, e.g.,* La. Dep't of Env't Quality, Agency Int. No. 198351, FG LA Complex Basis for Decision and Public Comments Response Summary 40–42 (2020), https://edms.deq.louisiana.gov/app/doc/view?doc=11998452 [https://perma.cc/P85S-3959] (comparing various historical trends in air emissions in Louisiana).

47. *See, e.g.,* Kimberly A. Terrell & Gianna St. Julien, *Air pollution is linked to higher cancer rates among black or impoverished communities in Louisiana,* 17 ENV'T RSCH. LETTERS 014033, 8-10 (2022), https://iopscience.iop.org/article/10.1088/1748-9326/ac4360/pdf [https://perma.cc/3G8D-7FGW].

48. *TRI National Analysis,* EPA (last updated March 15, 2023), https://www.epa.gov/trinationalanalysis/where-you-live [https://perma.cc/V8S4-YQWS]. (showing no state has a higher amount of air releases than Louisiana).

49. *2021 TRI Factsheet: State - Louisiana*, EPA (Oct. 2023), https://enviro.epa.gov/triexplorer/tri_factsheet.factsheet_forstate?pYear=2021&pstate=LA&pParent=NAT [https://perma.cc/JZ93-G6K8].

50. *Id.*

51. *See* Terrell & St. Julien, *supra* note 47, at 8–10.

reported emissions of common industrial pollutants are 7 to 21-fold higher among industrialized communities of Color compared to industrialized White communities."[52] This same study noted that chemical manufacturing facilities were more likely to be within census tracts with a majority of people of color compared with other industrial facilities.[53]

This history and the current picture of air quality and industrialized communities in Louisiana set the stage for the next act of development, one directed by the federal and state governments in the name of addressing climate change, and featuring many characters familiar from past environmental justice struggles.

II. THE NEXT WAVE: CARBON CAPTURE, "BLUE" HYDROGEN, AND "GREEN" INDUSTRIAL POLICY.

Amid this backdrop of heavy industrialization and pollution come two proposed technological fixes for industrial civilization's carbon problem: CCUS and decarbonized hydrogen production.

A. CCUS and Blue Hydrogen: Keys to Decarbonization, or More Trouble Than They're Worth?

"CCUS" refers to a suite of technologies that purport to capture the carbon dioxide ("CO2") from power plants or large industrial sources, or directly from the ambient air, and then use that captured gas for other purposes; or to store it, usually by injection into deep geological formations.[54] The "U" in CCUS traditionally meant enhanced oil recovery, a process by which CO2 is injected into otherwise unproductive oil wells to assist in extracting additional product.[55] As far as the public has been

52. Kimberly A. Terrell & Gianna St. Julien, *Discriminatory outcomes of industrial air permitting in Louisiana, United States*, 10 ENV'T CHALLENGES 100672, 5 (2023), https://www.sciencedirect.com/science/article/pii/S2667010022002281/pdfft?md5=ab82678b61b6a7fc5704249702687c0a&pid=1-s2.0-S2667010022002281-main.pdf [https://perma.cc/L2GV-9E97].

53. *See id.* at 6.

54. *About CCUS*, IEA (Apr. 2021), https://www.iea.org/reports/about-ccus [https://perma.cc/4DXH-T3KV].

55. The long history of this process gives us the common refrain that CCUS is a "proven" technology. *See, e.g.,* Nadya Nikiforova, *Carbon Capture and Storage: A Critical Tool for Fighting Climate Change*, INT'L FIN. CORP. (Apr. 26, 2023), https://www.ifc.org/en/stories/2023/carbon-capture-and-storage [https://perma.cc/L3K3-VJD8].

informed, most of the proposed CCUS projects in Louisiana involve the captured CO2 being sent by pipeline to an injection well to be sequestered underground.[56]

CCUS is not without its technological hurdles and environmental impacts. From smokestack to geologic reservoir, real-world implementation of CCUS projects have ended in several dramatic failures. One large-scale demonstration of CCUS technology, the Petra Nova project, claimed that it would capture 90% of CO2 emissions from the W.A. Parish Unit 8 power plant, but actually underperformed that target dramatically according to EPA data.[57] The Shell Quest blue hydrogen CCUS project in Alberta, Canada emitted more CO2 than it captured over a period of five years.[58] In 2020, a liquified CO2 pipeline operated by Denbury ruptured in Satartia, Mississippi.[59] The resulting release of vaporized gas hospitalized 45 people and forced the evacuation of 200.[60]

56. *See, e.g.*, Empower, LLC, *Carbon Capture & Sequestration in Louisiana: Part 1: Permitting for rapid expansion* 7–9 (June 7, 2023), https://static1.squarespace.com/static/6422298c9536175973c5173c/t/647fba41fdb96c18bd68e27a/1686092354913/CCS+in+Louisiana_Part+1_7JUN2023.pdf [https://perma.cc/89LP-9W2N] (noting the disclosed pipeline provider for each of the proposed projects).

57. Suzanne Mattei & David Schlissel, *The ill-fated Petra Nova CCS project: NRG Energy throws in the towel*, INST. FOR ENERGY ECON. AND FIN. ANALYSIS (Oct. 5, 2022), https://ieefa.org/resources/ill-fated-petra-nova-ccs-project-nrg-energy-throws-towel [https://perma.cc/B252-CMMG].

58. Molly Taft, *Shell CCS Plant Emits More Greenhouse Gases Than It's Captured*, GIZMODO (Jan. 21, 2022), https://gizmodo.com/shell-ccs-carbon-capture-1848401554 [https://perma.cc/6AT2-Q28S].

59. Julia Simon, *The U.S. is expanding CO2 pipelines. One poisoned town wants you to know its story*, NPR (Sept. 25, 2023, 9:05 AM), https://www.npr.org/2023/05/21/1172679786/carbon-capture-carbon-dioxide-pipeline [https://perma.cc/4UPC-DC7H].

60. *Id.*

As mentioned, CCUS forms a component of another proposed industrial solution to climate change—"blue" hydrogen. As envisioned by boosters like the Hydrogen Council, hydrogen plays a dual role in transitioning away from fossil fuel use and its attendant GHGs:

> Hydrogen plays a vital role in the transition to a low-carbon economy, as it produces no harmful emissions when used as a fuel or energy storage medium. By reducing reliance on fossil fuels, hydrogen fosters environmental sustainability by minimizing carbon dioxide emissions and preserving natural resources. For instance, hydrogen fuel cells can power zero-emission vehicles, mitigating pollution and improving air quality in urban areas. Moreover, hydrogen can be utilized in hard-to-abate industries such as steel production and chemical manufacturing, enabling a decarbonization pathway.[61]

In this second role as a feedstock, hydrogen already serves as a necessary component of fertilizer production and chemical manufacturing.[62] Currently, much of the hydrogen that goes into those processes is "gray," meaning it is produced from methane gas by steam methane reformation.[63] This process in turn emits a tremendous amount of CO2.[64] Making "gray" hydrogen production "blue" would mean continuing to separate it from methane via steam reformation by capturing the resultant CO2 emissions and, likely, piping them away to be sequestered.[65]

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61. *World Environment Day 2023: Harnessing hydrogen's potential is essential for a just energy transition*, HYDROGEN COUNCIL (June 5, 2023), https://hydrogencouncil.com/en/world-environment-day-2023-harnessing-hydrogens-potential-is-essential-for-a-just-energy-transition/ [https://perma.cc/HUC6-RT2X]. The Hydrogen Council is a trade association of companies "representing the entire hydrogen value chain." *Founding Story*, HYDROGEN COUNCIL, https://hydrogencouncil.com/en/founding-story/, (last visited Dec. 1, 2023). Members include, among many others, Aramco, BP, Chevron, ExxonMobil, Sasol, and Shell. *Members*, HYDROGEN COUNCIL, https://hydrogencouncil.com/en/members/ [https://perma.cc/R5TG-WJTY] (last visited Dec. 1, 2023).).

62. *See* Pingping Sun et al., *Criteria Air Pollutants and Greenhouse Gas Emissions from Hydrogen Production in U.S. Steam Methane Reforming Facilities*, 53 ENVT'L SCI. & TECH. 7103, 7103 (2019).

63. Robert W. Howarth & Mark Z. Jacobson, *How Green is Blue Hydrogen?*, 9 ENERGY SCI. & ENG'G 1676, 1682 (2021).

64. Several reports estimate that steam methane reformation generates more than 10 tons of carbon dioxide for every one ton of hydrogen produced. *See id.* at 1680.

65. *See* WHEJAC, *supra* note 6, at xi (noting that blue hydrogen involves hydrogen production combined with carbon capture and sequestration technology).

In Louisiana, a number of investors proposed construction of new facilities that would produce hydrogen, usually as ammonia,[66] and sequester the CO2 emissions either in Class VI wells operated by the facility or through a pipeline and wells operated by a third-party, such as Denbury.[67] Like CCUS more broadly, there is evidence that blue hydrogen may not work as intended or be the most effective or efficient solution to decarbonizing the relevant industries.[68] One analysis found that, as a result of increased methane emissions, blue hydrogen production resulted in only 9-12% fewer total GHG emissions than gray hydrogen production.[69] When the same analysis compared the use of blue hydrogen to the burning of natural gas for energy, it found that "the greenhouse gas footprint of blue hydrogen, even with capture of carbon dioxide from exhaust flue gases, is as large as or larger than that of natural gas."[70]

The production of blue hydrogen also creates emissions of hazardous/toxic air pollutants that may impact communities near the production facilities. Hydrogen's reactivity makes it difficult to store and transport in its elemental form, but these difficulties can be neutralized by storing the hydrogen as ammonia.[71] Many of the proposed blue hydrogen facilities will produce, store and transport it in the form of ammonia.[72] Ammonia itself, in addition to its own noxious odor and irritating effects on the respiratory system, interacts with other compounds to form fine particulate matter pollution (PM2.5).[73] The EPA found that the available scientific evidence establishes a causal relationship between PM2.5

66. Hereinafter referred to as "blue hydrogen" or "blue ammonia," interchangeably.

67. *See, e.g.*, Empower, LLC, *Carbon Capture & Sequestration in Louisiana: Part 1: Permitting for rapid expansion* 7-9 (June 7, 2023), https://static1.squarespace.com/static/6422298c9536175973c5173c/t/647fba41fdb96c18bd68e27a/1686092354913/CCS+in+Louisiana_Part+1_7JUN2023.pdf [https://perma.cc/89LP-9W2N].

68. *See, e.g.,* Howarth and Jacobson, *supra* note 63 at 1684.

67. *Id.* at 1682.

70. *Id.* at 1684.

71. *See* Oscar Serpell et al., Ammonia's Role in a Net-Zero Economy*,* Kleinman Center for Energy Policy, University of Pennyslvania 3 (March 2023), *available at* https://kleinmanenergy.upenn.edu/wp-content/uploads/2023/03/KCEP-Digest53-Ammonias-Role-Net-Zero-Hydrogen-Economy.pdf.

72. Alexander H. Tullo, *Is ammonia the fuel of the future?*, CHEM. & ENG'G NEWS (Mar. 8, 2021), https://cen.acs.org/business/petrochemicals/ammonia-fuel-future/99/i8 [https://perma.cc/88PP-TYB9].

73. Jason Plautz, *Ammonia, a poorly understood smog ingredient, could be key to limiting deadly pollution*, SCI. (Sept. 13, 2018), https://www.science.org/content/article/ammonia-poorly-understood-smog-ingredient-could-be-key-limiting-deadly-pollution.

exposure and early mortality, cardiovascular, respiratory, and nervous system effects, and cancer.[74] The state of Louisiana regulates ammonia as a toxic air pollutant.[75] Apart from ammonia emissions, blue hydrogen production facilities can emit a variety of other toxic or hazardous air pollutants, as several of the examples below will demonstrate.[76]

Gray and blue hydrogen production can be contrasted with "green" hydrogen – a term that denotes hydrogen molecules separated from water via electrolysis that specifically uses electricity generated by means other than the burning of fossil fuels.[77] Until recently, this approach was not seen as a cost-effective method of generating hydrogen, but the declining cost of renewable energy may change that view sooner rather than later.[78]

B. The Federal Government's Big Spending on CCUS and Hydrogen.

Despite the potential faults, uncertainties, and dangers of wide-scale deployment of CCUS and blue hydrogen, the Biden administration has pushed policy that treats both as integral in mitigating global climate change. Industrial policy is "the main feature of Biden's legislative record."[79] The Roosevelt Institute, a progressive policy think tank, defines "industrial policy" as "any government policy that encourages resources to shift from one industry or sector into another, by changing input costs, output prices, or other regulatory treatment."[80] This could easily describe the chief pieces of economic legislation enacted by the U.S. federal government, including the Infrastructure Investment and Jobs Act (IIJA, or more commonly referred to as the bipartisan infrastructure law), the CHIPS Act, and the Inflation Reduction Act (IRA).[81] Both the IIJA and the IRA

74. *See* Reconsideration of the National Ambient Air Quality Standards for Particulate Matter, 88 Fed. Reg. 5558, 5561 (Jan. 27, 2023).

75. *See* LA. ADMIN. CODE tit. 33, pt. III, § 5112, tbl. 51.1 (2023).

76. *See infra* Part III.A.

77. *See* Howarth & Jacobson, *supra* note 63 at 1677.

78. *See id*.

79. Ryan Cooper, *Can Democrats Sell 'Bidenomics'?*, AM. PROSPECT (June 30, 2023), https://prospect.org/politics/2023-06-30-can-democrats-sell-bidenomics/ [https://perma.cc/G6MD-9AYL].

80. Todd Tucker, *Industrial Policy and Planning*, ROOSEVELT INST. (2019), https://rooseveltinstitute.org/wp-content/uploads/2020/07/RI_Industrial-Policy-and-Planning-201707.pdf [https://perma.cc/3ZPN-BY93].

81. *See* Willy C. Shih, *The New Era of Industrial Policy is Here*, Harv. Bus. Rev. Sept.-Oct. 2023 at 66, 69.

contained significant provisions intended to address climate change through the development of both the CCUS and hydrogen industries.

In addition to federal funding for traditional infrastructure, the IIJA contains a variety of provisions intended to accelerate the transition away from carbon-emitting energy uses.[82] One of these provisions created a pool of $8 billion to fund regional "hydrogen hubs,"[83] or projects that can "demonstrate the production, processing, delivery, storage, and end-use of clean hydrogen; and … can be developed into a national clean hydrogen network to facilitate a clean hydrogen economy."[84] Louisiana has partnered with Arkansas and Oklahoma to vie for some of this funding to create the "HALO Hub," which "will use public-private partnerships that will help deploy and develop an extensive hydrogen network in the three states that would in turn be integrated into a national hydrogen network."[85]

Approximately $370 billion of the IRA's costs—a significant portion—went to what can broadly be termed "climate" policy. This includes a massive subsidy for "blue" hydrogen and CCUS more broadly in the expansion of the 45Q tax credit.[86] Section 45Q of the U.S. Internal Revenue Code provides for a refundable tax credit for each tonne of CO2 captured and stored or utilized.[87] The changes to that section of the IRA include a substantial increase in the maximum dollar amount of the credit—from $50/tonne to $85/tonne—and provisions that made the credits both directly payable and transferable.[88] The IRA also lowered the capture threshold for industrial facilities from 100,000 tonnes per year to 12,500, meaning that more and smaller facilities will be able to recoup the credit.[89] In essence, it

82. *See generally* Infrastructure Investment and Jobs Act, Pub. L. No. 117-58, 125 Stat. 429 (2021).

83. *Id.* § 40314, 125 Stat. at 1009.

84. *Id.* § 40314, 125 Stat. at 1008.

85. Mark Schleifstein, *Clean sweep? Louisiana may be in line for big grant to create regional hydrogen hub*, NOLA.COM (Jan. 2, 2023), https://www.nola.com/news/environment/louisiana-seeks-major-grant-for-regional-hydrogen-hub/article_07c97e44-8633-11ed-8db1-5baa48ebf7f2.html [https://perma.cc/TT9H-C73T].

86. *See generally* Inflation Reduction Act of 2022, Pub. L. No. 117-169, § 13104, 136 Stat. 1818, 1924-28.

87. *See* 26 U.S.C. § 45Q.

88. *See* Inflation Reduction Act of 2022, Pub. L. No. 117-169, § 13104, 136 Stat. 1924-28; *see also* 26 U.S.C. § 6417 (providing for direct payment of 45Q credit); 26 U.S.C. § 6418 (providing for transferability, or sale to third parties, of 45Q credit). To receive the full amount of the 45Q credit, qualified facilities must also meet prevailing wage and apprenticeship requirements in the statute. 26 U.S.C. § 45Q(h).

89. Inflation Reduction Act of 2022, Pub. L. No. 117-169, § 13104(a)(1), 136 Stat. 1924; *see*

is Section 45Q that makes CCUS (and, by extension, blue hydrogen) an economically worthwhile endeavor at all. Without this direct subsidy by the U.S. federal government, one would be hard-pressed to see the profit in the construction, maintenance, and operation of expensive pollution control equipment that the law does not require.

The IRA also included a tax subsidy for the production of "clean" hydrogen,[90] but the principle of "no double-dipping" prevents a company from recouping both 45Q and the hydrogen production credit.[91] Thus, this credit is only available to facilities that produce "green" or other varieties of low or no-carbon hydrogen. Finally, the law also provides for federal funding for projects aimed at reducing emissions from energy intensive industries like steel and chemical production—industries that hydrogen could play a role in decarbonizing.[92]

C. Louisiana's Climate Action Plan and CCUS Primacy – Decarbonization By Industrialization.

In response to the twin (and synergistic) crises of coastal erosion and climate change, Louisiana Governor John Bel Edwards created the state's Climate Initiatives Task Force in 2020.[93] This task force, comprised of state officials, academics, industry representatives, and community advocates, was ordered to "investigate and make recommendations" on how the state could meet the goal of achieving net-zero greenhouse gas emissions by 2050.[94]

To accomplish this, the Task Force contracted with the Louisiana State University ("LSU") Center for Energy Studies ("CES") to conduct an inventory of the state's greenhouse gas emissions.[95] This inventory revealed

also 26 U.S.C. § 45Q(d)(2)(C).

90. Inflation Reduction Act of 2022, Pub. L. No. 117-169, § 13204, 136 Stat. 1935-36; *see also* 26 U.S.C. § 45V.

91. Inflation Reduction Act of 2022, Pub. L. No. 117-169, § 13204, 136 Stat. 1937; *see also* 26 U.S.C. § 45V(d).

92. Inflation Reduction Act of 2022, Pub. L. No. 117-169, § 50161, 136 Stat. 2049-50; *see also* 42 U.S.C. § 17113a.

93. *See* Exec. Order No. JBE 20-18, 46 La. Reg. 1197 (Sept. 20, 2020), *available at* https://www.doa.la.gov/media/dzyfxgqd/2009.pdf [https://perma.cc/K6L4-4JP2].

94. *Id.*

95. David E. Dismukes, *Louisiana 2021 Greenhouse Gas Inventory*, LSU CENTER FOR ENERGY STUDIES 4 (2021), https://www.lsu.edu/ces/publications/2021/louisiana-2021-greehouse-gas-inventory-

a few notable facts about those emissions: 1) since 2008, Louisiana sources emitted an average of 4.2% of the total GHGs emitted in the U.S.;[96] 2) the vast majority of Louisiana's emissions –66 %—came from industrial sources, as compared to 17% of the U.S. total being from those sources;[97] and 3) factoring in proposed new sources, industrial emissions of GHGs in Louisiana were on track to *massively increase*—from an estimated 141.46 million tons per year in 2018 to a potential height of around 243 million tons per year—by 2026.[98] Crucially, "industrial" sources here excludes electric generation and includes petroleum refining, liquified natural gas export, and chemical manufacturing.[99] Unsurprisingly, the top 20 industrial emitters of GHGs in Louisiana are located almost entirely in either the Industrial Corridor or the Lake Charles area.[100]

The effort of the Task Force culminated in the submission of the Louisiana Climate Action Plan to Governor Edwards.[101] The Plan included a significant section dedicated to "Industrial Decarbonization," with a set of strategies and policy recommendations to accomplish that goal.[102] Significant for the purposes of this paper, these recommendations included "ACTION 5.2: Promote low-carbon alternative fuels and feedstocks for petrochemical industrial processes[103]" and "ACTION 5.3: Support the safe and responsible deployment of carbon capture, utilization, and storage for

df-rev_reduced.pdf [https://perma.cc/MT3B-JFPW].

96. *Id.* at 6.

97. *Id.* at 7.

98. *Id.* at 18, 30. This projected increase would be driven mostly by liquid natural gas ("LNG") export facilities and chemical manufacturing. *Id.* at 31.

99. *See id.* at 7 (considering "electric power" as a separate component of total state-wide emissions from "industrial"); *id.* at 31 (including LNG export, refining, and chemical manufacturing in projected emissions increase).

100. *See id.* at 26. The two exceptions to this are Sabine Pass LNG, which is located southwest of Lake Charles, and the Phillips 66 refinery, located in Plaquemines Parish, just downriver from what is traditionally considered "Cancer Alley." *See id.*

111. *See* CLIMATE INITIATIVES TASK FORCE, LOUISIANA CLIMATE ACTION PLAN: CLIMATE INITIATIVES TASK FORCE RECOMMENDATIONS TO THE GOVERNOR iii (2022); *see also* Exec. Order No. JBE 20-18, 46 La. Reg. 1197, 1198 (Sept. 20, 2020), *available at* https://www.doa.la.gov/media/dzyfxgqd/2009.pdf [https://perma.cc/K6L4-4JP2] (By February 1, 2022, the Task Force shall submit to the Governor and Coastal Protection and Restoration Board a detailed plan for meeting the goals provided in Section 2 of this Order. The plan, in whole or in part, shall also be submitted to the relevant legislative committees.").

102. *See* CLIMATE INITIATIVES TASK FORCE, LOUISIANA CLIMATE ACTION PLAN: CLIMATE INITIATIVES TASK FORCE RECOMMENDATIONS TO THE GOVERNOR 52-63 (2022).

103. *Id.* at 59.

high-intensity and hard-to-abate emissions."[104] In further explaining the first of these recommendations, the Plan cited the disproportionate role that chemical manufacturing GHG emissions play in the state's emissions profile and stated that "[t]o reduce emissions from chemicals production and petroleum manufacturing, low- and no-carbon hydrogen as well as captured CO2 can replace carbon-intensive feedstocks."[105] This recommendation also borrowed its definition of "low-carbon hydrogen" from the Infrastructure and Jobs Act of 2021—a definition that includes blue hydrogen.[106]

Between the massive economic incentives enacted by Congress and the state's vision of climate action, policymakers at both levels seek to spur investment in the construction and operation of CCUS and blue hydrogen facilities. This attempt, as the next section will discuss, has seen some success in Louisiana, but only if one defines "success" as corporations announcing major investments. Only a vocal minority discusses the environmental justice ramifications of addressing industrial carbon emissions by *increasing* industrial development.[107] As the previous sections showed, the polluting industry in Louisiana is concentrated geographically in areas with large Black populations (in many cases, majority Black populations).[108] Without a strategy to address those ramifications, a looming build-out of blue hydrogen, and other new emissions sources that will incorporate CCUS, risks perpetuating the disproportionate siting of industrial facilities in and near Black communities in Louisiana and the accompanying burden of air pollution discussed in Section I.

104. *Id.* at 60.
105. *Id.* at 59.
106. *Id.*
107. *See, e.g*, CLIMATE INITIATIVES TASK FORCE, *supra* note 102, at 145 (noting the objections of Task Force members to blue hydrogen and CCUS as part of Climate Action Plan).
108. *See supra* Part I.

II. LOUISIANA'S BLUE HYDROGEN EXPLOSION: CLIMATE SOLUTION OR THE ENTRENCHMENT OF FOSSIL FUEL RACISM?

A. Louisiana's Blue Build-out.

Perhaps anticipating the building of the new wave of government economic incentives and promotion of the new hydrogen economy, Air Products announced its Ascension Parish blue hydrogen facility at a joint press conference with Louisiana Governor John Bel Edwards in October of 2021.[109] A little over a year later, Clean Hydrogen Works proposed its own plant—"Ascension Clean Energy"—again, alongside Governor Edwards.[110] Most recently, St. Charles Clean Fuels announced its plans for a blue ammonia facility, downriver of Ascension in St. Charles Parish in April of 2023.[111] Elsewhere in Cancer Alley, fertilizer manufacturers Nutrien and CF Industries proposed their own blue ammonia plants.[112] Each of these facilities proposes to capture the vast majority of their GHGs.[113]

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109. *See Gov. Edwards, Air Products Announce $4.5 Billion Blue Hydrogen Clean Energy Complex*, OFF. GOVERNOR LA. (Oct. 14, 2021), https://gov.louisiana.gov/index.cfm/newsroom/detail/3421 [https://perma.cc/9PRG-PQPN].

110. *See Energy Start-Up Proposes $7.5 Billion Investment in Ascension Parish*, LA. ECON. DEV. (Oct. 31, 2022), https://www.opportunitylouisiana.gov/led-news/news-releases/news/2022/10/31/energy-start-up-proposes-$7.5-billion-investment-in-ascension-parish [https://perma.cc/783C-DUWQ].

111. *See St. Charles Clean Fuels Proposes $4.6 Billion Reduced-Carbon Ammonia Facility in St. Rose*, LA. ECON. DEV. (Apr. 19, 2023), https://www.opportunitylouisiana.gov/led-news/news-releases/news/2023/04/19/st.-charles-clean-fuels-proposes-$4.6-billion-reduced-carbon-ammonia-facility-in-st.-rose [https://perma.cc/37LA-LYBQ].

112. *See Nutrien Announces Intention to Build World's Largest Clean Ammonia Production Facility,* NUTRIEN, https://www.nutrien.com/investors/news-releases/2022-nutrien-announces-intention-build-worlds-largest-clean-ammonia [https://perma.cc/2TRF-HA2A] (last visited Sept. 1, 2023) ("The new clean ammonia plant would leverage low-cost natural gas … and high-quality carbon capture and sequestration infrastructure at its existing Geismar, LA facility…"); *CF Industries Announces Planned $2 Billion Carbon-Capture Ammonia Complex in Ascension Parish*, LA. ECON. DEV. (Aug. 17, 2022), https://www.opportunitylouisiana.gov/led-news/news-releases/news/2022/08/17/cf-industries-announces-planned-$2-billion-carbon-capture-ammonia-complex-in-ascension-parish [https://perma.cc/T5JZ-3EPU].

113. *Louisiana Clean Energy*, AIR PRODUCTS (last accessed Dec. 5, 2023), https://www.airproducts.com/louisiana-clean-energy [https://perma.cc/4U3G-MCPY](claiming that "[t]he clean energy complex will use a safe and proven technology called carbon capture and sequestration (CCS) to capture 95 percent of the carbon emissions during the production of hydrogen,"); *Ascension Clean Energy*, CLEAN HYDROGEN WORKS, https://www.cleanhydrogenworks.com/ace [https://perma.cc/F5SK-787Z] (last accessed Dec. 5, 2023) (claiming that the facility will have "up to

The facilities proposed by Air Products, Clean Hydrogen Works, Nutrien, and CF Industries would be located in Ascension Parish,[114] the site of past environmental justice struggles in Louisiana.[115] Air Products' blue ammonia plant would be a stone's throw from Burnside,[116] where the victories of the *Save Ourselves* community group defined the contours of Louisiana environmental law.[117] Ascension Parish also immediately borders St. James Parish, the site of resistance to the proposed Shintech and Formosa Plastics facilities.[118] Given that air pollution is not known for respecting political boundaries, it is worth considering the impacts these facilities might have on communities across the region.

Despite the assurances that these facilities will produce "clean" fuel or "clean energy," the associated carbon capture systems will not capture or sequester all of the harmful emissions associated with these facilities. Air Products would emit nearly 200 tons per year of ammonia, over 95 tons of nitrogen oxides ("Nox") and over 66 tons of volatile organic compounds ("VOCs").[119] Both of these proposed projects would add significant emissions to already overburdened neighborhoods. The area near the proposed Air Products facility is in the 98th percentile for air toxics cancer

98% CO2 capture."); Robert Stewart, *A $4.6 billion "blue" ammonia plant could be coming to St. Charles Parish*, NOLA.COM (Apr. 19, 2023), https://www.nola.com/news/business/a-blue-ammonia-plant-could-be-coming-to-st-charles-parish/article_57a4538c-dee7-11ed-9d41-27f431f825f7.html [https://perma.cc/MNP8-ZUYR] (noting that St. Charles Clean Fuels claims it "would rely on carbon capture technology to sequester more than 90% of its carbon dioxide emissions."); NUTRIEN, *supra* note 112 (claiming that "clean ammonia will be manufactured using innovative technology to achieve at least a 90 percent reduction in CO2 emissions."); *Mitsui & Co., Ltd. and CF Industries Announce Plans for New Blue Ammonia Capacity in the United States*, CF INDUS. (May 3, 2022), https://www.cfindustries.com/newsroom/2022/cf-mitsui-update [https://perma.cc/48TP-W2QF] ("The new facility will produce blue ammonia by leveraging carbon capture and sequestration processes to reduce carbon emissions by more than 60% compared to conventional ammonia.").

114. *See* sources cited *supra* note 110.

115. *See supra* Part I.

116. *Compare* Burnside, Louisiana, GOOGLE MAPS, https://maps.app.goo.gl/DrE7ohRnXZmSsGHi8 [https://perma.cc/6SQ7-67H7] (last visited February 22, 2024) *with* Letter from Kimberly Goslin, Env't Engineer, Air Products and Chemicals, Inc. to Bliss Higgins, Assistant Sec'y La. Dep't of Env't Quality, Off. of Env't Servs. – Air Permits Div. (Mar. 21, 2022), https://edms.deq.louisiana.gov/app/doc/view?doc=13210585 (Air Products Darrow site map at page 76 of the document).

117. *See* Houck, *supra* note 29, at 409.

118. *See generally* Kuehn, *supra* note 34; Rosenberg, *supra* note 40.

119. Letter from Kimberly Goslin, Env't Engineer, Air Products and Chemicals, Inc. to Bliss Higgins, Assistant Sec'y La. Dep't of Env't Quality, Off. of Env't Servs. – Air Permits Div. (Mar. 21, 2022), https://edms.deq.louisiana.gov/app/doc/view?doc=13210585

risk and 99th percentile for toxic releases to air in the state.[120] The proposed Ascension Clean Energy facility would emit nearly 100 tons per year of fine particulate matter (PM2.5), 200 tons of Nox, 200 tons of carbon monoxide, and over 140 tons of ammonia.[121] The area within five miles of that facility is 73% people of color and ranks in the 94th percentile nationwide for air toxics cancer risk and 99th percentile for toxic releases to air.[122] The proposed CF Industries and Mitsui Chemical blue ammonia joint venture would be located, according to CF, at its new "Blue Point complex." Land records show that "CF Industries Blue Point LLC" purchased land upriver from its existing facility in Donaldsonville.[123] While no permit application exists yet to evaluate the potential emissions from the new venture, the area in a 5-mile radius of the land purchased by CF is in the 94th percentile nationally for air toxics cancer risk and the 99th percentile nationally for toxic releases to air.[124]

Based on its permit application, the blue hydrogen/ammonia facility at St. Charles Clean Fuels would emit significant amounts of ammonia, along with other hazardous air pollutants like benzene, formaldehyde, and toluene.[125] The Census blockgroup bordering the proposed St. Charles Clean Fuels location to the east is also in the 98th percentile nationally for air toxics cancer risk and 96th percentile nationally for toxic air releases, in addition to being 77% people of color.[126]

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120. *EJScreen: Environmental Justice Screening and Mapping Tool*, EPA, http://ejscreen.epa.gov/mapper [https://perma.cc/AJ93-ZJ88] (drop a pin with a 5-mile buffer centered at the approximate location of the Air Products facility at 30.129979, -90.913976) (PDF on file with author) (last visited Sept. 1, 2023).

121. Letter from Kerry Brouillette, Senior Env't Scientist, CK Assoc., to Bliss Higgins, Assistant Sec'y La. Dep't of Env't Quality, Off. of Env't Servs. – Air Permits Div. (June 30, 2023), https://edms.deq.louisiana.gov/app/doc/view?doc=13880259 [https://perma.cc/SN8M-JZZZ].

122. *EJScreen: Environmental Justice Screening and Mapping Tool*, *supra* note 120 (drop a pin with a 5 mile buffer centered at the approximate location of the ACE facility at 30.176104, -91.037322) (PDF on file with author) (last visited Sept. 1, 2023).

123. *Report for 8401 Noel Rd.*, ASCENSION ASSESSOR, https://beacon.schneidercorp.com/Application.aspx?AppID=1188&LayerID=35843&PageTypeID=4&PageID=13572&Q=545667246&KeyValue=324700 [https://perma.cc/9T6Z-HUC6] (last visited Sept. 1, 2023).

124. *EJScreen: Environmental Justice Screening and Mapping Tool*, *supra* note 120 (drop a pin with a 5 mile buffer centered at the approximate location of the CF Industries Blue Point facility at 30.144051, -91.023510) (PDF on file with author) (last visited Sept. 1, 2023).

125. Letter from Jeffery Budd, Env't Project Specialist, Dep't of Env't Quality, Off. of Env't Servs., to Ramesh Raman, Project Director & CEO, St. Charles Clean Fuels, LLC (May 25, 2023), https://edms.deq.louisiana.gov/app/doc/view?doc=13839639 [https://perma.cc/SJC3-AL5V].

126. *EJScreen: Environmental Justice Screening and Mapping Tool, supra* note 120 (select

B. Environmental Justice in the Biden Administration

Environmental justice demands both the "***fair treatment*** and ***meaningful involvement*** of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies."[127] These tenets of fair treatment and meaningful involvement, correspond roughly to the division of the field by environmental justice scholars into the concepts of *procedural justice, distributive justice, corrective justice,* and *social justice*.[128] The EPA considers fair treatment to mean that "no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental and commercial operations or policies,"[129] which corresponds to *distributive justice*, or the idea of justice in the distribution of both environmental harms and environmental benefits.[130]

Chiefly, the problem of the looming wave of CCUS and blue hydrogen development in Louisiana is one of distributive justice—that the costs of air pollution will once again be borne by the same communities overburdened by the state's previous waves of industrialization, while the financial benefits will accrue to the same corporations that previously benefited. Overburdened areas in the Industrial Corridor will see worsening air quality, while CF Industries and Mitsui will reap the largess of the IRA's expansion of the 45Q tax credit. These new sources of "traditional" air pollutants, built

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Census blockgroup 220890622001) (PDF on file with author) (last visited Sept. 1, 2023]).

127. *Environmental Justice*, EPA, https://www.epa.gov/environmentaljustice [https://perma.cc/5T3Q-M9YC] (last visited Sept. 1, 2023) (emphasis added).

128. *See* Robert R. Kuehn, *A Taxonomy of Environmental Justice*, 30 ENV'T L. REP. 10681 (2000); *see also* ROBERT D. BULLARD, DUMPING IN DIXIE 116 (2d. ed. 1994).

129. *Learn About Environmental Justice*, EPA, https://www.epa.gov/environmentaljustice/learn-about-environmental-justice [https://perma.cc/HDL6-49Q9] (last visited Dec. 6, 2023).

130. *See* Kuehn, *supra* note 128, at 10683–84. *Procedural Justice* refers to the "right to treatment as an equal. That is the right, not to an equal distribution of some good, but to equal concern and respect in the political decision about how these goods and opportunities are to be distributed." *Id.* at 10688. In the environmental justice context, concerns about procedural justice arise around public participation in environmental decision-making. *See id.* "*Corrective justice* involves fairness in the way punishments for lawbreaking are assigned and damages inflicted on individuals and communities are addressed." *Id.* at 10697 (emphasis added). In the environmental justice context, this could involve focusing enforcement efforts on minority and low-income communities afflicted by pollution. *See id.* Finally, *social justice* refers to a broader and more nebulous concept that "presents environmental justice as part of larger problems of racial, social, and economic justice and helps illustrate the influence of politics, race, and class on an area's quality of life." *Id.* at 10699.

in areas already overburdened by air pollution, are exactly the kind of investments that the industrial policy of the Biden administration sought in the service of decarbonization, despite the voiced commitment to environmental justice from its earliest days.

On January 27, 2021, President Biden issued Executive Order 14008, "Executive Order on Tackling the Climate Crisis at Home and Abroad.[131] This Order references environmental justice as a concept throughout, and explicitly declares that it is the policy of the Biden administration to "secure environmental justice and spur economic opportunity for disadvantaged communities that have been historically marginalized and overburdened by pollution and underinvestment …"[132] Substantively, this order established two new White House advisory bodies on environmental justice, directed federal agencies to use existing authorities and appropriations to pursue environmental justice aims, and enacted the Justice40 initiative.[133] This initiative aims to ensure that 40% of the overall benefits of federal investments flow to disadvantaged communities, presumably including those investments made in massive federal spending bills like the IIJA and IRA.[134] Biden followed this up in April 2023 with Executive Order 14096, "Revitalizing Our Nation's Commitment to Environmental Justice for All,"[135] which, among other things, established a White House Office of Environmental Justice, declared that each federal agency "should make achieving environmental justice part of its mission," and ordered that each such agency craft an Environmental Justice Strategic Plan that would "set forth the agency's vision, goals, priority actions, and metrics to address and advance environmental justice …"[136]

Despite these commitments, and the efforts the EPA has put into creating mapping tools and crafting guidance,[137] there is a serious lack of any federal environmental justice policy with real teeth. With respect to

131. Tackling the Climate Crisis at Home and Abroad, 86 Fed. Reg. 7619, 7619 (Jan. 27, 2021).
132. *Id.* at 7629.
133. *See id.* at 7631–32.
134. *See id.* at 7632.
135. Revitalizing Our Nation's Commitment to Environmental Justice for All, 88 Fed. Reg. 25251 (Apr. 21, 2023).
136. *See id.* at 25256.
137. *See, e.g.,* OFFICE OF AIR AND RADIATION, U.S. ENV'T PROTECTION AGENCY, PRINCIPLES FOR ADDRESSING ENVIRONMENTAL JUSTICE IN AIR PERMITTING(2022), https://www.epa.gov/system/files/documents/2022-12/Attachment%20-%20EJ%20in%20Air%20Permitting%20Principles%20.pdf [https://perma.cc/AE4G-M2FG].

permitting under the CAA, EPA has taken the position that discretion allows it to condition or deny Prevention of Significant Deterioration ("PSD") permits "based on environmental justice, siting, or other considerations not explicitly addressed by other provisions in part C of title I of the [CAA]."[138] However, "the Agency has never attempted to establish permit conditions based directly and exclusively on such authority."[139]

Crucially, this only applies to permits issued by EPA. Permitting authority under the CAA is largely devolved to state-level agencies, including the Louisiana Department of Environmental Quality, who have their own state law to follow in issuing permits.[140] EPA sets minimum rules for these state level permitting programs, but "[a]t present, these rules do not explicitly discuss environmental justice considerations and thus do not directly require state permitting authorities to reflect these considerations in their permitting decisions."[141] In litigation, LDEQ has represented that no statute or regulation requires it to consider environmental justice when issuing air permits.[142] Without a change in black-letter law, air permits can and will be issued to facilities like Air Products or St. Charles Clean Fuels and lauded as "clean" new developments without any consideration of whether the added pollution from those facilities falls disproportionately on low-income or Black communities.

Community organizations in the Industrial Corridor have attempted to address this by filing a complaint with the EPA, alleging that LDEQ's air permitting program violates Title VI of the Civil Rights Act.[143] The EPA's

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138. OFFICE OF GENERAL COUNSEL, U.S. ENV'T PROTECTION AGENCY, 360R22001, EPA LEGAL TOOLS TO ADVANCE ENVIRONMENTAL JUSTICE at 41 (2022), https://www.epa.gov/system/files/documents/2022-05/EJ%20Legal%20Tools%20May%202022%20FINAL.pdf. PSD permits are the permits required by the Clean Air Act to construct a new facility that would be a major source of air pollutants. *Id.* at 37.

139. *Id.*

140. *See* 40 C.F.R. § 52.970 (1998) (approving Louisiana's State Implementation Plan for Clean Air Act permitting as of May 31, 1972); *see also* Office of General Counsel, *supra* note 138, at 37 ("Under the CAA, states have primary responsibility for issuing permits, and they can customize their NSR programs within the limits of EPA regulations.").

141. Office of General Counsel, *supra* note 138, at 38.

142. *See, e.g.*, The Louisiana Department of Environmental Quality's Mem. in Opp'n to Pet. for Judicial Review at 35-36, Rise St. James, et al. v. Louisiana Department of Environmental Quality, No. 694029, (19th Jud. Dist. La., Dec. 6, 2021) (on file with author).

143. Halle Parker, *Shuttered EPA investigation could've brought 'meaningful reform' in Cancer Alley, documents reveal*, WWNO (Aug. 29, 2023), https://www.wwno.org/2023-08-29/shuttered-epa-investigation-couldve-brought-meaningful-reform-in-cancer-alley-documents-reveal [https://perma.cc/F5S6-PN7M].

External Civil Rights Office investigated this complaint and conducted negotiations over a resolution for more than a year before it administratively closed it without making any conclusion about whether LDEQ's air permitting program created a disparate impact on Black communities in Louisiana.[144] During the pendency of the negotiations, the Louisiana Attorney General filed suit against the EPA, asking the court to both enjoin the EPA from continuing to pursue the complaints against LDEQ and throw out the entirety of the EPA's Title VI civil rights regulations.[145] The EPA's closure of the complaint cited to ongoing legal actions in the Industrial Corridor and forthcoming regulatory changes that it believes will address overall air quality issues in the Corridor.[146] Drafts of the shelved resolution agreement between the EPA and LDEQ reveal a framework that would have inserted consideration of environmental justice and cumulative impacts into LDEQ's air permitting program.[147]

C. "Clean" Fuels and the Risk of Entrenchment

Without the guardrails of an enforceable environmental justice policy, there is potential for the Biden administration's massive economic incentives of CCUS and associated developments like blue hydrogen—its signature legislative achievements—to worsen situations of environmental injustice in the name of reducing the nation's carbon footprint. One recent review of environmental justice literature addressed exactly this possibility, recognizing that "carbon-first" policies to address climate change could, without addressing our political economy's fundamental reliance on oil and gas, lock in our existing "fossil fuel racism."[148]

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144. *Id.*

145. *Id.; see also* Complaint at 55–56, Louisiana v. EPA, No. 2:23-00692 (E.D. La. May 24, 2023), ECF No. 1.

146. *See* Letter from Lillian Dorka, Deputy Assistant Adm'r for External Civil Rights, U.S. Env't Prot. Agency, to Roger Gingles, Secretary, La. Dep't of Env't Quality (June 27, 2023)., *available at* https://www.epa.gov/system/files/documents/2023-06/01R-22-R6%20and%2004R-22-R6%20Administrative%20Closure%20Letter%20for%20LDEQ%206.27.2023.pdf.

147. *Id.*

148. *See* Timothy Q. Donaghy et al., *Fossil fuel racism in the United States: How phasing out coal, oil, and gas can protect communities*, 100 ENERGY RES. & SOCIAL SCI. 103104 (2023). This paper analyzes "fossil fuel racism" as a specific subset of environmental racism, "characterized by the disproportionate and racialized effects of climate change, fossil fuel extraction, transportation, processing, and consumption on Black, Brown, Indigenous and poor populations." *Id.*

The expansion of the 45Q credit and its availability to virtually any CCUS project effectively provides a federal subsidy for the continued extraction, transportation, and end use of natural gas.[149] Construction of blue hydrogen facilities like those proposed for Cancer Alley will pour more capital investment into an end-use of natural gas, which causes concern that such reliance will require the construction of additional fossil fuel infrastructure.[150]production. One can see the irony of a policy that aims to achieve decarbonization but instead pours billions in subsidies into infrastructure and production deepening our economy's dependence on fossil fuels rather than breaking with it. As one renewable energy advocate put it, "[t]he fossil-fuel industry is happy to promote the hydrogen fiction because the majority of the hydrogen sold today is actually a byproduct of the natural-gas industry."[151]

At least one study suggests that the carbon sequestered during the production of blue hydrogen will be largely outweighed by the climate impact of the increased methane emissions all along the life cycle of that hydrogen.[152] So not only will these facilities emit harmful air pollutants apart from GHGs, but they may also fail to advance the federal or state government's climate goals. The Biden Administration created a "Climate and Economic Justice Screening Tool" that "uses datasets that are indicators of burdens in eight categories: climate change, energy, health, housing, legacy pollution, transportation, water and wastewater, and workforce development."[153] This tool classifies the Census tracts where Ascension

149. As discussed in the previous section, blue hydrogen would likely be produced from natural gas. See *supra*, Part II.A; see also Howarth & Jacobson, *supra* note 63, at 1677. Any proliferation of facilities producing blue hydrogen would necessarily require increased extraction of natural gas and its transportation to the blue hydrogen facility. *See* Bauer et al., *On the climate impacts of blue hydrogen production*, 6 Sustainable Energy Fuels 66, 71 (noting that for blue hydrogen to be considered low carbon, "[f]irst, natural gas supply must be associated with low GHG emissions, which means that natural gas leaks and methane emissions along the entire supply chain, including extraction, storage, and transport, must be minimized."). Every dollar of the 45Q credit that goes to a blue hydrogen facility represents a dollar of federal subsidy for that supply chain.

150. *See* WHEJAC, *supra* note 6, at 4 ("Proposed and existing pipelines for some carbon management, such as CCS projects, correspond with the location of EJ communities already overburdened by fossil fuel infrastructure. The technologies are ones that seek to be inserted into existing fossil fuel infrastructure."), 8 (identifying as a concern of environmental justice communities "[f]ossil fuel infrastructure lock-in that extends the life of polluting fossil fuels.").

151. SAUL GRIFFITH, ELECTRIFY: AN OPTIMIST'S PLAYBOOK FOR OUR CLEAN ENERGY FUTURE 196 (2021).

152. Howarth & Jacobson, *supra* note 63, at 1682.

153. Council on Environmental Quality, *About*, CLIMATE & ECON. JUST. SCREENING TOOL,

Clean Energy, CF Industries Blue Point, and St. Charles Clean Fuels propose to locate as "disadvantaged."[154] These "Justice40" communities should receive 40% of the benefits from investments in clean energy.[155] Unless 40% of the windfall those facilities receive from the expanded 45Q credit flows to the workers and residents of the surrounding area facing exposure to the added non-GHG air pollutants, this initiative will fail to address the issues of distributive justice that the IRA's massive investment in carbon-centric solutions worsens.

CONCLUSION AND RECOMMENDATIONS

The recent legislative initiatives of President Biden and the 117th U.S. Congress to address climate change through expanded financial incentives for CCUS and hydrogen development may have unintended environmental justice consequences. Communities like those in Louisiana's Cancer Alley, already brimming with fossil fuel and petrochemical industry, have become the targets of new industry incorporating CCUS, including facilities that will manufacture blue hydrogen/blue ammonia. These facilities will increase the pollution burden in those communities, while companies like Air Products and CF Industries reap the largesse of the 45Q tax credit. I offer here two suggestions of strategies that policymakers should explore to fulfill the promises made by the Biden administration in its environmental justice commitments.

The first is to rethink the 45Q credit and related subsidies. The IRA was a monumental achievement in terms of the federal investment into climate policy that could achieve concrete emissions reductions. A presidential administration and Congress sympathetic to the goals of both climate policy and environmental justice may be loath to roll back any portion of the law. However, restricting the federal credit for CCUS going forward to projects

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https://screeningtool.geoplatform.gov/en/about#7.76/28.734/-67.022 (last visited Dec. 6, 2023).

154. *See* Council on Environmental Quality, *Explore the map*, CLIMATE & ECON. JUST. SCREENING TOOL, https://screeningtool.geoplatform.gov/en/#11.01/30.1778/-91.0707 (last visited Dec. 6, 2023) (identifying Census Tract 22005030900 as "disadvantaged."); *Explore the map,* Climate and Economic Justice Screening Tool https://screeningtool.geoplatform.gov/en/#12.75/29.95153/-90.33478 (last visited Dec. 6, 2023) (identifying Census Tract 22089062200 as "disadvantaged.").

155. *See* Council on Environmental Quality, *supra* note 153 ("Federal agencies will use the tool to help identify disadvantaged communities that will benefit from programs include in the Justice40 Initiative."),

that sequester existing emissions rather than subsidizing new fossil fuel projects is one method to at least prevent further emissions in already-overburdened communities. The White House Environmental Justice Council's ("WHEJAC") Carbon Management Workgroup recently released a set of recommendations that recognized that carbon management programs including CCUS "have serious impacts on communities affected by environmental injustice."[156] That body made recommendations to halt the implementation of federal programs supporting such technologies, including specifically that the Biden Administration should "[d]e-classify as 'Justice40 Covered Programs' those programs that advance CCUS, CCS and any other carbon management technologies that do not immediately reduce dependency on fossil fuel sources of energy."[157] The working group took the position that counting such projects as Justice40 programs "is a direct subversion of the Justice40 initiative and is an indicator of burdens rather than community benefit."[158] Also, an increase in the subsidy for hydrogen produced by electrolysis, such as green hydrogen, could further accelerate investments into that technology at a commercially viable scale. The Biden Treasury Department recently released proposed rules for this subsidy – the 45V credit – that seek to ensure the maximum amount possible goes to the production of hydrogen with the smallest amount of lifecycle greenhouse gas emissions.[159]

The second is to adopt environmental justice requirements for permitting. Whether at the state or federal level, a requirement for permitting agencies to consider the relative environmental justice burdens in issuing air, water discharge, and hazardous waste permits, and to deny permits on the basis of a disproportionate burden on racial minorities or low-income populations, could prevent further clustering of polluting industry in areas like Cancer Alley. The WHEJAC Carbon Management Workgroup also recommended potential host communities for "carbon management technologies" like CCUS "must have a right of refusal for carbon management projects that do no immediately reduce dependency on fossil

156. WHEJAC, *supra* note 6, at 4.
157. *Id.* at 3
158. *Id.* at 4.
159. *See* Section 45V Credit for Production of Clean Hydrogen; Section 48(a)(15) Election To Treat Clean Hydrogen Production Facilities as Energy Property, 88 Fed. Reg. 89220, 89220-21 (Dec. 26, 2023).

fuel sources of energy."[160] At the state level, New Jersey recently finalized a set of regulations that aims to do exactly that.[161] If it had been finalized, the agreement resolving EPA Title VI civil rights investigation against LDEQ would have also implemented such a policy.[162] At the federal level, the long-stalled "Environmental Justice For All Act" would create a federal requirement to consider environmental justice and cumulative impacts when considering individual permits under the Clean Water Act and Clean Air Act.[163] While these measures will not necessarily address the retrenchment of fossil fuel infrastructure subsidized by policy like the 45Q credit, they could at least address the concentration of pollution burdens in already existing environmental justice communities furthered by that policy.

160. *Id.* at 3. Where in the law this right might come from is an open question. *See supra* Part III.B (discussing environmental justice in Clean Air Act permitting).

161. *See* N.J. ADMIN. CODE §§ 7:1C-1.1, 1.3 *et seq.* (2023).

162. *See* Parker, *supra* note 143.

163. *See* A. Donald McEachin Environmental Justice For All Act, H.R. 1705, 118th Cong., 1st Sess. § 7(a)–(b) (2023).