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Unveiling the Environmental Impact of Large Language Models on Indigenous Communities: A Call for Action and Liability

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Large Language Models (LLMs) have rapidly gained popularity for their language generation and comprehension capabilities, promising increased efficiency in various sectors. However, while celebrated for their transformative potential, LLMs exacerbate current climate issues. This Article highlights the detrimental environmental footprint of LLMs, with a focus on their role in escalating climate change and their disproportionate effects on Indigenous communities. These communities, closely tied to their land, bear the brunt of environmental degradation, further aggravated by LLM-induced emissions.

This Article first dissects the interplay between environmental justice and technological innovation, advocating for a reevaluation of the trust relationship between tribal nations and the federal government. Drawing upon constitutional principles, it proposes an affirmative duty mandating federal intervention to curb LLM-induced carbon emissions and impose liability. The Article then explores other forms of liability as an alternative to federal interventions, highlighting grassroots initiatives and legislative frameworks at both national and state levels. By foregrounding the environmental implications of LLMs, this Article underscores the necessity of conscientious technological advancement to safeguard the well-being of Indigenous communities and foster sustainable progress.

* © 2025 Nina-Simone Edwards, Senior Institute Associate, Georgetown Law Institute of Technology Law & Policy; J.D., Georgetown University Law Center. Although I am not Indigenous, I believe it is my responsibility as an inhabitant of this land to share my (legal) knowledge and conviction regarding the protection of land and tribal nations (including, specifically, their sovereignty). The title highlights the often-overlooked realities faced by Indigenous peoples, but it is not meant to suggest that Indigenous communities are unaware of these issues themselves. In fact, we should always look to them first, ensuring that we do not overburden them or shift responsibilities onto them. I would like to thank Najarian Peters for much-needed support in the writing process. I am also grateful to the editors at the *Tulane Environmental Law Journal* for their editing and support during the publication process.

I. INTRODUCTION

Large Language Models (LLMs) have become extremely popular over the last few years due to the mainstream introduction of LLMs such as ChatGPT. LLMs, artificial intelligence (AI) systems skilled at generating and understanding language,[1] have been used to boost productivity and increase efficiency and have opened up a wide range of opportunities for companies to do things like analyze data or solve problems at a faster rate than what has been previously possible.[2] For years, LLMs have been touted as "transforming" fields such as science, and overwhelmingly impacting society as a whole.[3] The innovation of LLMs, however, has an unfortunate impact on the climate.

Climate change refers to both natural and man-made shifts in temperatures and weather patterns.[4] Human activities, such as burning

1. Karina Edmonds & Mohan Shekar, *The Rise of AI: How Enterprises Harness the Power of Large Language Models*, FORBES (Sept. 11, 2023), https://www.forbes.com/sites/sap/2023/09/11/the-rise-of-ai-how-enterprises-harness-the-power-of-large-language-models/.

2. *Id.*

3. Alex Tamkin & Deep Ganguli, *How Large Language Models Will Transform Science, Society, and AI*, STANFORD INST. FOR HUMAN-CENTERED A.I. (Feb. 5, 2021), https://hai.stanford.edu/news/how-large-language-models-will-transform-science-society-and-ai.

4. *See What is Climate Change?*, UNITED NATIONS (Dec.12, 2022) [hereinafter U.N. CLIMATE CHANGE], https://www.un.org/en/climatechange/what-is-climate-change; INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2022: SUMMARY FOR ALL 3 (2022) [hereinafter IPCC SUMMARY], https://www.ipcc.ch/report/ar6/wg1/downloads/outreach/IPCC_AR6_WGI_SummaryForAll.pdf.

fossil fuels, have been the main contributors to climate change and have increased emissions from the main greenhouse gases that contribute to climate change.[5] Human activities have also caused all "observed warming . . . since the pre industrial era . . . ."[6] Global warming has already caused widespread, unprecedented changes.[7] A decrease in rainfall, the disappearance of glaciers, and a rise in sea levels impact all humans on Earth,[8] but Indigenous communities feel the effects of climate change more than other groups of people.

While there is no official definition of "Indigenous," self-identification, culture, strong links to territories and natural resources, as well as historical ties to pre-colonial/settler societies are all key features.[9] For the purposes of this Article, which focuses on the United States, "Indigenous" is used to refer to those who identify as American Indians, Alaska Natives, and Native Hawaiians. Indigenous peoples and communities (globally and within the United States) are diverse, but "there are common features that confer greater vulnerability to climate change impacts."[10]

Due to Indigenous communities' reliance on and connection to their land, climate change impacts those communities first, and often, harder. For example, "[o]ne study found that coastal Indigenous communities eat 15 times as much seafood as non-Indigenous people in the same country—food that is being heavily impacted by everything from pollution to warming waters and ocean acidification."[11]

This Article does not seek to address the horrible ramifications of climate change on Indigenous populations. Instead, this Article seeks to highlight an additional source of climate change, or at least a burden that

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5. The four key greenhouse gases are that contribute to climate change are: carbon dioxide, nitrous oxide, methane, and chlorofluorocarbons. *See The Causes of Climate Change*, NASA, https://climate.nasa.gov/causes; *see also* U.N. CLIMATE CHANGE, *supra* note 4; *see also* IPCC SUMMARY, *supra* note 4, at 6.

6. IPCC SUMMARY, *supra* note 4, at 7.

7. *Id.* at 4.

8. *Id.* at 4, 5.

9. *See Who Are Indigenous Peoples?, Factsheet*, UN PERMANENT F. ON INDIGENOUS ISSUES, https://www.un.org/esa/socdev/unpfii/documents/5session_factsheet1.pdf (explaining that "an official definition of 'indigenous' has not been adopted by any UN-system body."); Rhys Jones et al., *Climate Change Mitigation Policies and Co-Impacts on Indigenous Health: A Scoping Review*, 17 INT'L. J. ENV'T RSCH. PUB. HEALTH 1, 1 (2020) (citing UNITED NATIONS, STATE OF THE WORLD'S INDIGENOUS PEOPLES 1–11 (2009)).

10. *See* Jones et al., *supra* note 9, at 1–2.

11. Nicola Jones, *How Native Tribes Are Taking the Lead on Planning for Climate Change*, YALE ENV'T 360 (Feb. 11, 2020), https://e360.yale.edu/features/how-native-tribes-are-taking-the-lead-on-planning-for-climate-change.

is exacerbating existing harms: LLMs. These ever so popular LLMs, purported to revolutionize society, are not new to critique.[12] However, the impact on the environment—and, by extension, on Indigenous communities—cannot be overstated.

This Article, in highlighting the environmental harms caused by LLMs, connects these powerful AI systems to Indigenous communities. Instead of simply bringing efficiency or productivity to these communities, LLMs are contributing to climate change and harming Indigenous communities on a variety of levels. The companies that build and deploy LLMs must be held liable for their negative impact on the environment and on Indigenous communities.[13]

Part II of this Article discusses the environmental impacts of LLMs and how these impacts affect Indigenous communities. This part analyzes the connection between carbon emissions from LLMs and the broader climate-related challenges faced by Indigenous communities.

Part III examines the trust relationship between tribal nations and the federal government. In particular, this part explores how this relationship could give rise to an affirmative duty enforceable under the Due Process Clause, potentially obligating the federal government to control the carbon emissions generated by LLMs.

Part IV explores other pathways for liability. This part discusses calls to action that may help solve this issue, particularly those that have led to international agreements. It focuses specifically on efforts by a national nonprofit and Alaska Natives in discussing calls to action that have been initiated to discuss viable solutions.

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12. There have been a lot of discussions about AI systems perpetuating a variety of issues, including bias, discrimination, privacy violations, and copyright infringement. In a recent interview with an AI expert, questions pertaining to AI systems "causing harm through biased algorithms" as well as "[p]roblems of bias being baked into AI technology" were highlighted. Zoe Corbyn, *AI Pioneer Fei-Fei Li: 'I'm More Concerned About the Risks that Are Here and Now*, GUARDIAN (Nov. 5, 2023), https://www.theguardian.com/technology/2023/nov/05/ai-pioneer-fei-fei-li-im-more-concerned-about-the-risks-that-are-here-and-now. "Although many of these tools offer the promise of advancement, their use also has the potential to perpetuate unlawful bias, automate unlawful discrimination, and produce other harmful outcomes." JOINT STATEMENT ON ENFORCEMENT EFFORTS AGAINST DISCRIMINATION AND BIAS IN AUTOMATED SYSTEMS (2023), https://www.ftc.gov/legal-library/browse/cases-proceedings/public-statements/joint-statement-enforcement-efforts-against-discrimination-bias-automated-systems.

13. This Article addresses companies that build, distribute, train, and deploy LLMs. However, any company or entity connected to LLMs and their associated harms is implicated in this discussion, regardless of whether their involvement pertains to training, deployment, or both. These terms are used interchangeably throughout this Article to encompass a wide variety of companies, all of which are included in this examination.

Part IV also discusses another potential response to this issue: legislation. It draws on congressional legislation that has led to Environmental Protection Agency regulations and considers how similar legislative efforts could help alleviate the climate crisis that LLMs are contributing to. This part also looks at Alaskan legislation and discusses how both existing legislation and new legislation can be effective solutions for holding the companies that build and deploy LLMs accountable, both nationally and statewide.

Despite the risks, harms, and proposed avenues of liability that this Article highlights, LLMs, and the rapid pace of their development, have generated significant excitement. A recent Forbes article captures this sentiment: "As amazing as ChatGPT seems to us at the moment, it is a mere stepping stone to what comes next."[14] Addressing the environmental harms that LLMs like ChatGPT exacerbate is pivotal to ensuring that the "stepping stone" that comes next is not even more harmful to Indigenous communities.

II. THE HARMS OF LLMS

In order to truly understand the extent of the harm that LLMs have on the environment, and thus, on Indigenous communities, this part describes them. This Article's insistence on generating liability from a variety of different solutions is due to what is really at stake here: the large-scale impact that these systems have on real people. The general impact that LLMs have on the environment will be discussed before the specific impact they have on Indigenous communities is addressed.

A. The Environmental Impact of LLMs

As LLMs have grown in popularity, they have also grown in size and parameters to achieve better performance.[15] Parameters are the connections used to "learn patterns based on the training data" and are used to measure the size of LLMs.[16] Parameters can also be thought of as settings that can be adjusted to control how an LLM generates text.[17]

14. Rob Toews, *The New Generation of Large Language Models*, FORBES (Feb. 7, 2023), https://www.forbes.com/sites/robtoews/2023/02/07/the-next-generation-of-large-language-models/.

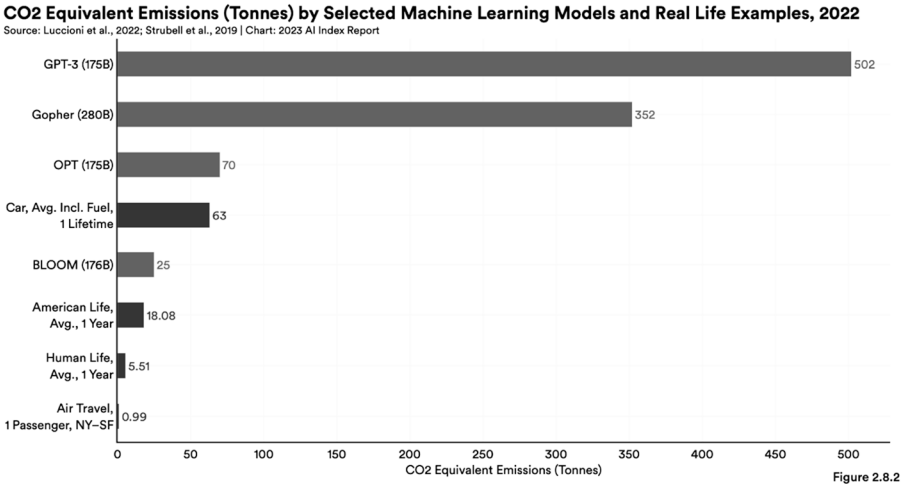
15. Sasha Luccioni, *The Mounting Human and Environmental Costs of Generative AI*, ARS TECHNICA (Apr. 2023), https://arstechnica.com/gadgets/2023/04/generative-ai-is-cool-but-lets-not-forget-its-human-and-environmental-costs/.

16. *See id.*

17. *See* Michael Ehab, *The Secrets of Large Language Models Parameters: How They Affect the Quality, Diversity, and Creativity of Generated Texts [With Examples]*, MEDIUM,

LLMs like ChatGPT had around 100 million parameters in 2018; in 2023, Google's PaLM had around 500 billion parameters.[18] The process of building and deploying these LLMs requires the use of a lot of resources: "rare metals for manufacturing GPUs, water to cool huge data centers, [and] energy to keep those data centers running . . . ."[19] In 2019, researchers found that training an LLM with only about 213 million parameters emitted the carbon emissions equivalent to that of about five cars over their lifetimes.[20] ChatGPT-3 used carbon intensive energy sources like coal and natural gas, using up to 500 metric tons of carbon emissions, which is equivalent to the emissions given off by driving an average gasoline-powered car for more than a million miles.[21] For the purposes of this article, it will be presumed that there is no differentiation between the emissions released during training and during deployment of the models; the emissions are disturbingly high no matter where the line is drawn. The following chart from Stanford's AI Index Report compares the carbon footprints of certain LLMs.[22] Although, it is essential to note that there is no real standardization for tracking emissions of LLMs.[23]

Figure 1: CO2 Equivalent Emissions by Selected Machine Learning Models



https://michaelehab.medium.com/the-secrets-of-large-language-models-parameters-how-they-affect-the-quality-diversity-and-32eb8643e631.

18. *See* Luccioni, *supra* note 15.

19. *See id.*

20. *See id.* (citing Emma Strubell et al., *Energy and Policy Considerations for Deep Learning in NLP*, ARXIV (June 5, 2019), https://arxiv.org/abs/1906.02243).

21. *See id.*

22. NESTOR MASLEJ, ET AL., THE AI INDEX 2023 ANNUAL REPORT 121 (AI Index Steering Comm., Inst. for Human-Centered AI, Stanford Univ. 2023).

23. *Id.* at 120.

These emissions, as illustrated in the 2023 AI Index Report, significantly exceed those contributed by individual human beings. While LLMs are beyond our imagination in terms of their usefulness and helpfulness, and even while being used to find ways to taper their detriment to the environment,[24] they have already negatively impacted the environment in ways that exacerbate the harms already present. An increase in carbon emissions leads to an increase in the overall temperature of the planet: according to the Intergovernmental Panel on Climate Change, "[c]arbon dioxide remains in the atmosphere for a very long time—some of it for centuries to millennia. Adding more carbon dioxide to the atmosphere will cause further warming."[25] With the large-scale introduction, innovation, and continued expansion of LLMs, the carbon footprint that these LLMs have is contributing to the amount of carbon dioxide that remains in the atmosphere, and thus, will cause further warming. This warming accelerates the widespread and rapid negative changes that the environment is already experiencing: from ice sheets melting to shifts in rainfall patterns.[26] The impacts of climate change before the large-scale introduction of LLMs were already disproportionately impacting Indigenous peoples.[27] Indigenous communities have always been "on the front lines of climate change,"[28] but now we are at a time where we are seeing an exponential increase in carbon emissions from tools that are meant to better the lives of many of its users. Many organizations have stated the importance of decreasing carbon emissions,[29] yet we see the opposite happening due to LLM use.

B. The Environmental Impact on Indigenous Communities

Despite calls to reduce carbon emissions, the proliferation of LLMs is exacerbating the problem. As a result, Indigenous communities, who

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24. *See* Poulomi Chatterjee, *ChatGPT is Ruining Our Environment, but There's a Way to Tackle It*, ANALYTICS INDIA (Feb. 23, 2023), https://analyticsindiamag.com/why-the-environmental-cost-of-chatgpt-is-overblown/; Vandana Nair, *The Environmental Impact of LLMs*, ANALYTICS INDIA (April 5, 2023), https://analyticsindiamag.com/the-environmental-impact-of-llms/.

25. IPCC SUMMARY, *supra* note 4, at 13.

26. *Id.* at 4.

27. *See generally* Josh Merrill, *Climate Change and its Effect on Indigenous Peoples of the Climate Change and its Effect on Indigenous Peoples of the Southwest*, 38 AM. INDIAN L. REV. 225-259 (2013).

28. Julie Halpert, *Native Americans and a Changing Climate*, YALE CLIMATE CONNECTIONS (June 21, 2012), https://yaleclimateconnections.org/2012/06/native-americans-and-a-changing-climate/.

29. *See generally* IPCC SUMMARY, *supra* note 4.

are already vulnerable to the effects of climate change, are facing even greater challenges due to man-made contributions.[30] This Article does not argue that LLMs are the primary reason for this suffering—only that they are a contributing factor and should be regarded and discussed in a way that accurately reflects the true impact they have. These environmental impacts should not be overlooked because of the promises of a technological future.

This is especially true given the fact that climate change poses diverse and severe threats to Indigenous communities around the world, affecting not only their environment, but the resources they need to live. Rising temperatures and increased wind speeds have led to a loss of vegetation for the Indigenous communities in the Kalahari Desert.[31] For the Indigenous communities in the Himalayas, glaciers are melting and impacting hundreds of millions of dwellers who depend on that flow of water.[32] In the Amazon, there is an increase in deforestation, which means that more carbon is released into the atmosphere.[33] Further, Indigenous communities are likely to experience an increase in droughts and fires in that area.[34] For Indigenous communities in the Arctic region, climate change is impacting the availability of their traditional food sources, and the changing ice and weather patterns affect their safety in traveling.[35] The Indigenous communities in Finland, Norway, and Sweden are experiencing a loss of reindeer, which are vital not only as a food source but also for their culture and economy.[36] Over a third of Alaska Native villages also face significant climate threats—from erosion to flooding to thawing permafrost.[37]

All of these, and other climate-related factors threaten the health of Indigenous communities. An increase in water temperatures (and other climate changes) may also lead to the growth of harmful algal blooms that can contaminate water and fish.[38] Thawing permafrost impacts

30. *See id.* at 7 (explaining that human activities are the primary source of greenhouse gas emissions, particularly carbon dioxide, which drive rising global temperatures).

31. *See Climate Change*, U.N. DEP'T OF ECON. & SOC. AFFAIRS, https://www.un.org/development/desa/indigenouspeoples/climate-change.html.

32. *Id.*

33. *Id.*

34. *Id.*

35. *Id.*

36. *Id.*

37. *See generally Tribal and Native American Issues*, U.S GOV'T ACCOUNTABILITY OFF., https://www.gao.gov/tribal-and-native-american-issues.

38. *See Climate Change and the Health of Indigenous Populations*, ENV'T PROT. AGENCY, https://www.epa.gov/climateimpacts/climate-change-and-health-indigenous-populations.

communities that use ice to store food, which means that food spoilage and sickness are becoming more common.[39] For Indigenous communities that live near urban or industrial areas, the air quality can worsen due to an increase in air pollutants.[40] Thus, whether it is the food, the water, or simply the air, the health of Indigenous communities is threatened. Moreover, these harms may also contribute to mental health issues: Climate change only amplifies the trauma that Indigenous peoples may have due to colonization, removal from their lands, and loss of culture.[41] Climate change—and its long-lasting harm to tribal lands—contributes to, and aggravates, the disruption of land and cultural practices,[42] and the environmental degradation caused by LLMs only adds to that disruption.

III. AN ENFORCEABLE SPECIAL TRUST RELATIONSHIP

The federal government should address the disruption discussed in Part II due to the trust relationship established with tribal nations that provides for a duty of protection, as this part explores. Part III discusses the relationship and details how this relationship could hypothetically address the impact that LLMs have on Indigenous peoples. This part establishes the possibility of this relationship being used to hold companies liable for these environmental impacts. Although this relationship has been called upon unsuccessfully in the past to address harms that Indigenous communities are experiencing, the persistent existence of the trust relationship provides an avenue through which the government can support Indigenous communities. Given the current inconsistencies of this relationship, the part that follows proffers solutions that do not require an understanding or agreement to the legal arguments put forth in this part.

A. The "Special" Trust Relationship

Despite the exponential impact that climate change has on Indigenous communities—and LLMs' aggravation of this impact—Indigenous communities often do not find the support or help they need from the U.S. government. For example, in Alaska, rural communities face climate-related problems such as flooding and thawing permafrost.[43]

39. *Id.*
40. *Id.*
41. *Id.*
42. *Id.*
43. *See* Lara Fowler et al., *Addressing Climate Impacts in Alaska Native Tribes: Legal Barriers for Community Relocation due to Thawing Permafrost and Coastal Erosion*, 40 UCLA J. ENV'T L. & POL'Y 185, 187 (2022).

These communities have explored community relocation because of the lack of support that they receive from federal law and programs.[44] While federal law does provide support for disasters, thawing permafrost and coastal erosion do not qualify as such; thus, Indigenous communities lack the resources and support that they need.[45] Without this explicit federal governmental support, a potential solution for Indigenous communities could be to invoke the federal government's trust responsibility.

This "special" trust responsibility, often critiqued as paternalistic,[46] seems to both contain the ability to provide resources and fail to support in many other extremely important ways. In the context of federal Indian law, the trust relationship (and thus the special trust responsibility that this relationship creates) is the unique legal relationship between the federal government and tribal nations. Although this relationship purportedly entails an exchange of federal authority over Indigenous communities for protection, "history has shown that the Government seldom acts in compliance with this relationship."[47]

In 1832, the United States Supreme Court referred to the trust relationship as a "duty of protection."[48] This duty of protection is consistently maintained as an "abstract principle" of federal legislation related to tribal affairs.[49] Although abstract, this relationship is still recognized today: as of December 18, 2024, according to the official website of the Department of Interior, the department "protects and manages the Nation's natural resources and cultural heritage" as well as "honors its trust responsibilities . . . to American Indians, Alaska Natives, Native Hawaiians, and affiliated Island Communities,"[50] and there is a Secretarial Order from 2014 that reaffirms the federal trust responsibility

44. *Id.* at 185.

45. *Id.* at 187.

46. *See generally* Daniel I.S.J. Rey-Bear & Matthew L.M. Fletcher, *"We Need Protection from Our Protectors": The Nature, Issues, and Future of the Federal Trust Responsibility to Indians*, 6 MICH. J. ENV'T & ADMIN. L. 397, 402 (2017); Logan Cooper, *Rising Tides, Rising Obligations: Enforcing Tribal Trust Responsibility for Climate Change Mitigation*, 9 ARIZ. J. ENV'T L. & POL'Y 62, 67 (2019); Roxanne Dunbar-Ortiz & Dina Gilio-Whitaker, *US Paternalism Still Presumes Power over Native Lands and Lives*, BEACON BROADSIDE (May 18, 2017), http://www.beaconbroadside.com/broadside/2017/05/us-paternalism-still-presumes-power-over-native-lands-and-lives.html.

47. Cooper, *supra* note 46, at 62.

48. Worcester v. Georgia, 31 U.S. 515, 556 (1832).

49. Rey-Bear & Fletcher, *supra* note 46, at 424 (citing FELIX S. COHEN, COHEN'S HANDBOOK OF FEDERAL LAW, at XI, XIII (1941)).

50. *About Interior*, U.S. DEP'T OF THE INTERIOR, https://www.doi.gov/about.

to tribes.[51] This is not to say that claims on a website ensure federal responsibility; this merely highlights the current governmental acknowledgment of the special trust relationship.

This relationship has been cited as a potential establishment of support for climate change struggles to no avail;[52] however, here, I briefly draw on the relationship aspect of this trust responsibility to find a specific Due Process violation. Nonetheless, given the historical denial of responsibility and protection for tribal nations from climate change-related issues, the purpose of this Article still remains largely related to LLMs, drawing attention to the issue, and proposing additional solutions for, liability related to policy and legislation.

B. The "Special" Trust Relationship and Due Process

The federal trust relationship has been characterized as both "a cornerstone of federal Indian law and essentially just a mere platitude."[53] In a 2017 Congressional hearing, the responsibilities of the Department of Interior to tribal nations were described as a "historical responsibility," rather than a legal one.[54] However, the many treaties that contractually established the federal-tribal relationship, the governmental affirmation of the trust relationship, in addition to the multitude of cases that have analyzed the responsibility, ensure the existence of the relationship.[55] In essence, the trust relationship remains enforceable because "the government 'has over the years made specific commitments to the Indian people through written treaties and through informal and formal agreements,' in exchange for which 'Indians . . . have often surrendered claims to vast tracts of land.'"[56] This includes the Government

51. *Agency Orders on Government-to-Government Consultation*, U.S. DEP'T OF THE INTERIOR, https://www.doi.gov/pmb/cadr/programs/native/Government-to-Government-Secretarial-Orders; U.S. DEP'T OF THE INTERIOR, SECRETARIAL ORDER 3335: REAFFIRMATION OF THE FEDERAL TRUST RESPONSIBILITY TO FEDERALLY RECOGNIZED TRIBES AND INDIVIDUAL INDIAN BENEFICIARIES (2014).

52. *See*, *e.g.*, Cooper, *supra* note 46, at 88.

53. Rey-Bear & Fletcher, *supra* note 46, at 399.

54. *Comparing 21st Century Trust Land Acquisition with the Intent of the 73rd Congress in Section 5 of the Indian Reorganization Act: Oversight Hearing Before the H. Subcomm. on Indian, Insular and Alaska Native Affairs*, 115th Cong. (2017) (statement of James Cason, Deputy Assistant Secretary, Bureau of Indian Affairs).

55. *See* discussion *infra* subpart III.A.

56. Brief for the Federal Petitioners at 22, Salazar v. Patchak, 565 U.S. 1092 (2012) (No. 11-247) (citation omitted).

Accountability Office's Strategic Plan of 2022-2027, which specifies a strategic objective relating to fulfilling the trust relationship.[57]

Daniel I.S.J. Rey-Bear and Matthew L.M. Fletcher detail the extent to which the federal-tribal trust relationship exists in the law: through principles of contracts and property, fiduciary duties, "a combination of trust law and the international law of foreign relations," and the constitutional authorization to "enact laws governing Indian affairs."[58] Although this relationship has not always been honored due to "outright racism and subordination of Indian interests to federal prerogatives,"[59] the relationship itself may be useful in recognizing a constitutional violation.

This relationship, given its history and current enforcement as one offering protection and resources for tribal nations, may fill the requirements of a "special relationship" described in *Deshaney v. Winnebago County Dep't of Social Services* and create an affirmative duty for the federal government to help Indigenous communities with their climate dilemmas.[60] The federal government could thus draw on this affirmative duty and impose liability on companies that build and deploy LLMs.

In *Deshaney*, the Supreme Court found that the harm that the petitioner suffered was not at the hands of a state actor; thus, there was no affirmative duty for the state to provide protection.[61] The Court further noted that certain "special relationships . . . may give rise to an affirmative duty, enforceable through the Due Process Clause, to provide adequate protection."[62] This duty arises from the "limitations which [the state] has imposed on his freedom to act on his own behalf, through imprisonment, institutionalization, or other similar restraint of personal liberty."[63] Thus, there must be both: (a) a special relationship and (b) limitations that the state itself imposes that limit the ability to act or restrain personal liberty.

As the next subpart expounds on, the federal trust relationship is a special relationship, and the restraints on personal liberty that the *Deshaney* Court mandates are found in Indian health law. Although the governmental-tribal relationship is not the same as it was at the inception of the trust responsibility, there are limitations that tribal nations and

57. U.S GOV'T ACCOUNTABILITY OFF., GAO-22-1SP, STRATEGIC PLAN 2022-2027 (2022).

58. Rey-Bear & Fletcher, *We Need Protection from Our Protectors, supra* note 46, at 401.

59. *Id.* at 460.

60. DeShaney v. Winnebago Cty. Dep't of Soc. Servs., 489 U.S. 189, 193–202 (1989).

61. *Id.* at 200.

62. *Id.* at 202.

63. *Id.* at 190.

Indigenous individuals experience due to this trust relationship. This is particularly ironic given the large-scale health impacts that Indigenous communities additionally suffer due to climate change, but the federal Indian health law sphere provides resources while shackling Indigenous communities to the constraints of governmental medical care. Due to this relationship, this affirmative duty would then force the federal government to act and hold companies that develop or produce LLMs liable for the carbon emissions that are produced.

C. The "Special" Trust Relationships' Failings: Indian Health Service

As this subpart details, Indigenous peoples' reliance on the Indian Health Service (IHS) leads to a restraint on their personal liberty. IHS is the primary provider of federal health care for Indigenous communities in the United States.[64] IHS provides direct medical and public health services to tribal members, pursuant to the assumed responsibility by the U.S. government.[65] IHS operates facilities in thirty-seven states with more than 600 health centers, clinics, stations, and hospitals. Importantly, the services that IHS provides, although they do provide direct services, are not as a health insurance provider. This means that should an individual receive care outside of an IHS facility, IHS does not guarantee coverage. Thus, Indigenous communities may solely rely on the health care that is guaranteed to them through this trust responsibility—why go elsewhere when IHS provides them with the health care that they need?[66]

Unfortunately, health care through IHS is rife with problems. Although IHS provides health care for about 2.6 million American Indians and Alaska Natives that belong to 574 federally recognized tribes, the services that IHS provides are not always accessible. For those who live outside of the geographic service areas of IHS facilities and programs, they do not have access to these free services.[67] This is an issue that

64. *See Quick Look,* INDIAN HEALTH SERVICE (Oct. 2024), https://www.ihs.gov/newsroom/factsheets/quicklook/.

65. *See* NATALIA OSTER, SUSAN SKILLMAN, & BIANCA FROGNER, HEALTH WORKFORCE ISSUES IN AMERICAN INDIAN AND ALASKA NATIVE (AI/AN) POPULATIONS (Ctr. for Health Workforce Studies, Univ. of Wash. 2022), https://familymedicine.uw.edu/chws/wp-content/uploads/sites/5/2022/07/2022_AI_AN_Workforce_RR_Brief.pdf

66. *See* INDIAN HEALTH SERV., *supra* note 64 (providing statistics showing that IHS is the primary provider of health care services).

67. *See* Mary Smith, *Native Americans: A Crisis in Health Equity*, AM. BAR ASS'N, https://www.americanbar.org/groups/crsj/publications/human_rights_magazine_home/the-state-of-healthcare-in-the-united-states/native-american-crisis-in-health-equity; *American Indian/Alaska Native Health*, U.S. DEP'T HEALTH & HUMAN SERV., https://minorityhealth.hhs.gov/american-indianalaska-native-health.

directly impacts those in remote reservation locations, which is only worsened by the fact that there is a shortage of medical personnel in many rural communities.[68] As a result, there are communities with limited access and/or access with limited personnel.

For those that do have access, according to a 2018 report from the Commission on Civil Rights, the U.S. government has not provided adequate funding, leaving health care "lag[ging] behind other groups, despite a legal obligation on the part of the United States to provide healthcare to American Indians and Alaska Natives."[69] In addition to a consistent lack of funding, there have been cases of misconduct, including sexual abuse and physical assault.[70] At one of the hospitals run by IHS, there were five governmental investigations that found that patients were dying due to inadequate care—from both misdiagnoses and insufficient treatments.[71] Indigenous communities are ultimately left with health care, granted to them from a governmental trust relationship, which is inadequate and leaves many unable to have their health needs met.

As stated, IHS is not the same as health insurance: It is recommended that Medicaid coverage fills the gaps. However, Indigenous communities have high uninsured rates—more than double the uninsured rate for Americans overall;[72] thus, if they are not insured, and they are receiving statistically inadequate care from IHS, their health will suffer.[73] In fact, their health *is* suffering: "American Indians and Alaska Natives born today have a life expectancy that is 4.4 years less than the United States' all races population, and they continue to die at

68. *See Smith*, *supra* note 67.

69. *Id.*; Charlotte Morabito, *How Federally Guaranteed Health Care for Native Americans Works in the U.S.*, CNBC, (July 3, 2021), https://www.cnbc.com/2021/07/03/native-american-health-care-how-the-us-indian-health-service-works.html.

70. *See Tribal and Native American Issues,* U.S. GOV'T ACCOUNTABILITY OFF., https://www.gao.gov/tribal-and-native-american-issues.

71. *See* Mark Walker, *Fed up with Deaths, Native Americans Want to Run Their Own Health Care,* N.Y. TIMES (Oct. 15, 2019), https://www.nytimes.com/2019/10/15/us/politics/native-americans-health-care.html.

72. MEDICAID & CHIP PAYMENT & ACCESS COMM'N, MEDICAID'S ROLE IN HEALTH CARE FOR AMERICAN INDIANS AND ALASKA NATIVES 3 (2021), https://www.macpac.gov/wp-content/uploads/2021/02/Medicaids-Role-in-Health-Care-for-American-Indians-and-Alaska-Natives.pdf.

73. *See* Latoya Hill and Samantha Artiga, *Health Coverage Among American Indian and Alaska Native and Native Hawaiian and Other Pacific Islander People,* KFF (Nov. 30, 2023), https://www.kff.org/racial-equity-and-health-policy/issue-brief/health-coverage-among-american-indian-and-alaska-native-and-native-hawaiian-and-other-pacific-islander-people/; Eric Whitney, *Native Americans Feel Invisible in U.S. Health Care System*, NPR (Dec. 12, 2017), https://www.npr.org/sections/health-shots/2017/12/12/569910574/native-americans-feel-invisible-in-u-s-health-care-system.

higher rates than other Americans in many categories of preventable illness . . . ."[74] With adequate health care, these preventable illnesses could be treated. However, many Indigenous peoples put up with "tolerated illness" where they ignore their medical problems because it is difficult for them to access care with IHS *and* without IHS.[75] Accessing private care is rare due to high poverty rates, living in rural areas with few health care providers, or high uninsured rates. For those with insurance, they are likely to experience prejudice and discrimination when going to a clinic outside of tribal areas. Although IHS does have funding for private medical services sought outside of the IHS system, IHS has declined to pay the medical bills of more than 500,000 patients.[76]

The Government Accountability Office put IHS on its list of programs in need of transformation in 2017.[77] They have specified that in addition to inadequate health care, IHS lacks consistent training processes and standard formats of review, and have thus established a Strategic Plan that addresses the U.S. government's responsibilities to Indigenous communities.[78] This Strategic Plan, for 2022-2027, includes performance goals evaluating federal policies and programs that serve Indigenous communities, as well as assessing federal efforts to "protect Native American cultural, environmental, and natural resources."[79]

Three things are clear: (1) the trust responsibility has not dissolved into a solely historical relationship, (2) the health of American Indigenous communities is important and a purported goal of the U.S. government, and (3) the special relationship between tribes and the federal government has already risen to an "affirmative" duty (seen through previous and current governmental actions, including IHS itself). The GAO has also discussed the large impact that climate change has on tribal nations; in addition to the government's role in health care, they also stress the importance of federal assistance to address climate threats.[80] Given the affirmative duty already assumed by the government, Indigenous communities may have a Due Process right. LLMs will only grow in

74. *Smith*, *supra* note 67.

75. *See* Whitney, *supra* note 73.

76. *See* Walker, *supra* note 71.

77. *See id.*

78. U.S. GOV'T ACCOUNTABILITY OFF., GAO-21-97, INDIAN HEALTH SERVICE: ACTIONS NEEDED TO IMPROVE OVERSIGHT OF PROVIDER MISCONDUCT AND SUBSTANDARD PERFORMANCE (2020); *Tribal and Native American Issues,* U.S. GOV'T ACCOUNTABILITY OFF., https://www.gao.gov/tribal-and-native-american-issues.; U.S. GOV'T ACCOUNTABILITY OFF., GAO-22-1SP, *Strategic Plan 2022-2027* (2022).

79. U.S. GOV'T ACCOUNTABILITY OFF., GAO-22-1SP.

80. *See* sources cited *supra* note 78.

popularity and increase in growth, size, and awe. The impact that LLMs have on the climate is attached to this growth, and will increase as well—unless it is controlled. The government already understands its duty to protect Indigenous communities, provide for their health, and protect their environmental resources. This Article argues that, under *Deshaney*, there is an affirmative duty that should be enforced by the Due Process clause.

The Due Process Clause of the Fourteenth Amendment provides that "[n]o State shall . . . deprive any person of life, liberty, or property, without due process of law."[81] The petitioner of the *Deshaney* Court discussed a liberty interest that primarily concerned private actors. Although it did not apply to the petitioner, the Court did state that an affirmative duty to protect may exist if there is a special relationship. Two elements must exist: (a) special relationship and (b) limitations that the state itself imposes that restrain personal liberty.

The trust relationship that Indigenous communities have with the federal government fulfills the special relationship element. The relationship has not only existed between Indigenous communities and the federal government for centuries,[82] but it has also been recently affirmed by multiple governmental agencies that there is a priority of governmental intervention in "Indian" affairs.

This part also established the second element: Indigenous communities are without adequate health care, they are dying, and LLMs, through their climate impact, aggravate their health conditions. Therefore, Indigenous communities are not able to make the best health-related decisions for themselves. Their personal liberty is restrained due to a variety of factors—from historical treaties to a lack of insurance. Indigenous communities seek health care from the federal government.

The Court in *Deshaney* detailed that the affirmative duty arises from "the limitations which it has imposed on his freedom to act on his own behalf, through imprisonment, institutionalization, or other similar restraint of personal liberty."[83] Here, this Article offers that given the lack

81. U.S. CONST. amend. XIV, § 1.

82. The timeline itself illustrates that this substantive due process right is one that is "deeply rooted in [] history and tradition." The Supreme Court has repeatedly expressed that due process rights are only protected if they are deeply rooted in this nation's history. *See* Moore v. City of E. Cleveland, 431 U.S. 494, 503 (1977); Washington v. Glucksberg, 521 U.S. 702, 703 (1997); Timbs v. Indiana, 586 U.S. 146 (2019). This principle was also recently reiterated in *Dobbs* when discussing that the right to abortion is not a right that is deeply rooted in this nation's history and tradition. *See* Dobbs v. Jackson Women's Health Organization, 597 U.S. (2022). The specific historic integration of the trust responsibility and the trust relationship is deeply rooted in this nation's history, as treaties establishing this relationship have been signed since the 1770s.

83. Deshaney v. Winnebago Cty. Dep't of Soc. Servs., 489 U.S. 189, 190 (1989).

of available health care (due to a lack of medical personnel or lack of care due to living in a specific area), the inadequate health care they receive (due to a lack of funding, misdiagnoses and insufficient treatments, or discrimination), and a lack of insurance (or discrimination experienced outside of IHS facilities), Indigenous communities' reliance on IHS is the definition of a restraint of personal liberty. They truly have no choice: IHS services are free but they subsequently receive inadequate care if they use IHS. They may not be able to see a doctor outside of IHS due to location, lack of insurance, discrimination, or financial reasons. If they do have a choice to see a doctor outside of IHS, for the small population that has insurance, they still may experience discrimination, and IHS will probably not help them pay those bills, despite the obligation and funding allocated for that purpose. Indigenous communities cannot truly claim they have liberty and freedom to choose their health care when their choice of health care is limited to bad choice A, bad choice B, or bad choice C. They do not have the liberty that they deserve to live full, healthy lives due to this restraint. Because the federal government refuses to live up to its end of the bargain and truly provide adequate health care, Indigenous communities are forced to live with "tolerated illness[es]" and otherwise preventable illnesses.[84] There is no personal liberty there: The government is truly impeding their ability to make choices that would keep them healthy. Of course, the government needs to fix the health care system, but the choices of Indigenous peoples are further impeded by the climate and the huge impact the climate has on their health. Should the government refuse to impose liability on the companies that develop and distribute LLMs, they are ensuring that the climate and health impacts that Indigenous communities are experiencing will continue.

Despite this truth, this is not the first argument of this kind: There have been arguments that the federal government's trust responsibility means that the government must step up to aid tribal nations in the many issues they face due to climate change.[85] It may also be easier to make this argument if LLMs directly impacted Indigenous communities—if, for example, each time someone types into ChatGPT, a plant dies, it would likely be easier to call for governmental help. It may also be difficult to understand this trust responsibility as one giving rise to the affirmative, enforceable duty discussed in *Deshaney*, as this argument has been a difficult one to make (as it was in *Deshaney* itself), and neither health insurance nor health care is even a legal right recognized for all within the

84. *See* Whitney, *supra* note 73.

85. *See generally* Cooper, *Rising Tide, supra* note 46.

United States.[86] In spite of these issues, this Article makes the following clear: The government arguably has an affirmative duty to care for Indigenous communities and their health. Whether the Due Process right is claimed or not, the government should hold the companies that build and deploy LLMs liable to curb these environmental issues.[87] Thus, Part III addresses additional ways that these companies can be found liable.

IV. CALLS TO ACTION AND LEGISLATION

The important thing that this Article hopes to foster is an understanding of the role that LLMs play in climate change, the impact on Indigenous communities, and plausible legal arguments or solutions. This Article, and this part, offers solutions, other than invoking the trust relationship, to hold companies liable for their environmental harms. It may be beneficial to first seek to raise awareness of this issue, given the specificity, and then move towards using that awareness to push for global agreements or conventions. Another solution, discussed in the second subpart IV.B, would be utilizing (both local and national) legislation and regulations as a way to raise awareness and begin implementing solutions. This subpart addresses the potentiality of both calls to action and legislation as viable opportunities for increasing knowledge about the issue and controlling emissions.

A. Calls to Action

One way to bring about liability, and spur movement, would be a call to action. This subpart argues that calls to action, in general, may not always be the answer, but there is an opportunity for a specific call to action to be particularly effective when paired with an agreement or convention.[88]

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86. For a discussion on health care in the United States, *see* Timothy Stoltzfus Jost, *Health Care in the United States and the Affordable Care Act*, AM. BAR ASS'N, https://www.americanbar.org/groups/crsj/publications/human_rights_magazine_home/the-state-of-healthcare-in-the-united-states/healthcare-in-us-aca/ (explaining that health care is not a constitutional right but that the federal government has sought to expand access through programs like the ACA).

87. This could be done through a governmental agency, such as the Bureau of Indian Affairs which has programs and services specifically related to tribal climate resilience, energy and minerals. This trust relationship, creating an affirmative duty in this situation, could be used to ensure that LLMs are not harming tribal nations through a program of the Bureau. An alternative, as discussed in Part IV, is for the government to impose liability and address the situation through legislation.

88. The use of the different terms is to keep the principle open. For the purposes of this Article, there is no differentiation between an agreement that is signed and a convention that is

Calls to action, generally, are rousing invitations to act in a certain way—depending on the speaker. Examples span decades in the United States: In the 1930s, politicians called for the government to share wealth with those who were unemployed.[89] In 2016, President Obama called on companies to lend their expertise to the refugee crisis.[90] Recently, AI experts and other public figures, including Sam Altman, CEO of OpenAI (the company that birthed ChatGPT), called for a shifting of priorities to mitigate AI risks: "Mitigating the risk of extinction from AI should be a global priority alongside other societal-scale risks such as pandemics and nuclear war."[91] This call to action makes up the Statement on AI Risk published by the Center for AI Safety.

There are a few different reasons why the Statement on AI Risk received such widespread attention. This particular statement is short and to the point, focusing on the potential risks and analogizing them to crises that everyone can relate to. Despite its brevity (or perhaps because of it), the statement garnered a lot of public interest and attention.[92] This could be due to the subject matter or the neutral perspective of the organization, but it could also be due to the signatories, which included a variety of global experts that bolstered the credibility of the statement. The elements that made this call to action so popular could be utilized to bring awareness to climate and health issues this Article discusses.

A call to action could be published by an organization such as the Center on AI Safety to address the environmental harms that LLMs contribute to and urge companies to sign a global environmental

ratified. Whether it is an agreement or convention it would state that XYZ company would agree to mitigate the climate impact that their LLMs have, among other things.

89. *See Historical Background and Development of Social Security,* SOC. SEC. ADMIN., https://www.ssa.gov/history/briefhistory3.html (last visited Aug. 23, 2024).

90. Barack Obama, *Remarks at Call to Action CEO Roundtable*, 2016 WHITE HOUSE OFF. COMMC'N 5030317 (Sept. 20, 2016).

91. *Statement on AI Risk,* CTR. FOR AI SAFETY, https://www.safe.ai/statement-on-ai-risk (last visited Aug. 16, 2024).

92. *See generally* Kevin Roose, *A.I. Poses 'Risk of Extinction,' Industry Leaders Warn*, N.Y. TIMES (May 30, 2023), https://www.nytimes.com/2023/05/30/technology/ai-threat-warning.html*;* Geneva Abdul*, Risk of Extinction by AI Should Be Global Priority, Say Experts*, GUARDIAN (May 30, 2023), https://www.theguardian.com/technology/2023/may/30/risk-of-extinction-by-ai-should-be-global-priority-say-tech-experts; Bobby Allyn, *Mitigating the Risk of AI Should Be a Global Priority, Open Letter Says*, NPR (May 30, 2023) https://www.npr.org/2023/05/30/1178919245/mitigating-the-risk-of-ai-should-be-a-global-priority-open-letter-says; *"Statement on AI Risk",* MIT TECHNOLOGIST, https://technologist.mit.edu/statement-on-ai-risk (last visited Aug. 15, 2024); Otto Barten & Joep Meinderstma, *An AI Pause Is Humanity's Best Bet for Preventing Extinction*, TIME (July 20, 2023), https://time.com/6295879/ai-pause-is-humanitys-best-bet-for-preventing-extinction.

agreement. Mitigating the climate risks that LLMs pose is an important issue, but the call to action must specify that Indigenous communities are harmed by LLMs' large environmental footprint to ground the discussion and bring awareness to the specific issue. Further, a call to action that specifies an environmental agreement that companies should sign would also ensure that companies would feel the need to follow the call, and the potential public response to the call, and sign the agreement. A general call to action, such as the one by the Center on AI Safety, would bring awareness to the issue, but in order to hold companies liable for the harms that LLMs exacerbate, there must be specific action that follows. A call to action that urges mitigating climate risks *and* signing a global environmental agreement could be useful.

International or global agreements are common among state actors, agencies, and companies. At present, there are environmental agreements that state actors have signed, such as the Kyoto Protocol, that sought the reduction of greenhouse gas emissions.[93] For this particular issue, given the distinct harms that Indigenous communities experience due to climate change, the agreement must prioritize and highlight Indigenous rights. These rights do not have to be newly defined: The United Nations has a Declaration on the Rights of Indigenous Peoples that specifies that Indigenous peoples have, for example, a right to life and improvement of their health.[94] These rights must be encompassed in the agreement that companies will be urged to sign.

Companies have signed agreements such as the International Accord for the Health and Safety in the Textile and Garment Industry to show their commitment to upholding human rights standards in their factories.[95] The precedent is there: It is not uncommon for a company to signify that they agree with standards or an agreement. Should a call to action be used as the primary method to begin to hold companies liable, the call to action should be accompanied by an agreement that specifies that companies will work to mitigate the climate impact. While global or international agreements are not always abided by, they do provide an avenue to hold entities accountable.

Nonetheless, a global or international call to action may be too big of an ask. A regional or national call to action—with the focus being on local environmental standards—could also be effective. In April 2023,

93. *See* Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 11, 1997, 2303 U.N.T.S. 162.

94. GAOR. 61/295 (Sept. 13, 2007).

95. *See Signatories*, INT'L ACCORD FOR HEALTH & SAFETY IN THE TEXTILE & GARMENT INDUS., https://internationalaccord.org/signatories/ (last visited Aug. 9, 2024).

Alaska Native leaders called for greater action to address the problem of violent crime against Alaska Natives and on tribal lands.[96] In this call to action at a commission meeting, they discussed their own experiences and proposed specific recommendations. This is a regional example of an Indigenous community proposing a call to action, but there are plenty of national organizations that may also propose a call to action regarding this issue. Nonetheless, this Article argues that the onus should not be on Indigenous communities. As evidenced by the April 2023 call to action that the Alaska Native leaders proposed, Indigenous communities already have more than enough that they are experiencing and fighting; they should not also have to tackle the environmental issues of extremely popular LLMs and their large companies. Calls to action from Indigenous communities would be welcome, of course, in order to ensure that their voices and experiences are heard and honored. However, nonprofits and organizations that are already focused on AI safety should highlight this issue and propose calls to action that center the voices and safety of Indigenous communities—especially as they are being impacted in such monumental ways.

Although a useful example, the Center for AI Safety's call to action is extremely general and a similar one would not necessarily hold companies liable, nor does it center marginalized communities. While generality is impactful for getting a lot of signatories (and that may be the first or only priority for an issue such as this), it would be incredibly useful (particularly to begin to see action take place) to specify the communities harmed as well as the action(s), such as an agreement, that the companies producing these LLMs should take. There is already research and work being conducted to mitigate these harms,[97] but a call to action should specify companies and their role in these harms.[98] This may mean having both a general call to action (that calls for a priority and highlights the harms, but that companies may be more willing to agree to) and a specific call to action (that calls for signatories on an agreement to begin mitigating environmental harms) that companies can respond to in order

96. *See* Sophia Carlisle*, Alaska Native Leaders Call for Action on Missing and Murdered Indigenous People During Anchorage Hearing,* ANCHORAGE DAILY NEWS (April 27, 2023), https://www.adn.com/alaska-news/2023/04/27/alaska-native-leaders-call- for-action-on-missing-and-murdered-indigenous-people-during-anchorage-hearing/.

97. *See* sources cited *supra* note 23.

98. Technology companies should be included because "AI hype is playing out today across many products, from toys to cars to chatbots and a lot of things in between. Breathless media accounts don't help, but it starts with the companies that do the developing and selling." Michael Atleson, *Keep Your AI Claims in Check*, FTC BUS. BLOG (Feb. 27, 2023), https://www.ftc.gov/business-guidance/blog/2023/02/keep-your-ai-claims-check.

to ensure that awareness is being raised and that companies are being held accountable.

Although the Center for AI Safety's call to action is not the first of its kind, it is "potentially the most impactful given its wider range of signatories and its core existential concern."[99] The entire statement is only twenty-two words, and its brevity was purposeful: It was meant to "unite A.I. experts who might disagree about the nature of specific risks or steps to prevent those risks from occurring, but who share general concerns."[100] Given the success—bringing a wide variety of leaders together and garnering a large amount of attention—of this call to action, a call to action regarding the environmental issues of LLMs could also garner the public attention and support that could hold companies liable.

Unfortunately, whether regional or international, calls to action do not always lead to action.[101] The calls to action proposed and discussed in this subpart focused on specific agreements and standards that are accompanied by the call to push some action beyond the call, but in proposing a call to action, this Article does not state that the problem will be solved. On the contrary, this Article draws attention to a recent call to action regarding AI and the potential for a similar call to action to, at the minimum, bring awareness to LLMs' environmental impact. A call to action, particularly one focused on urging companies like OpenAI to sign a global environmental agreement could be powerful and begin a movement towards mitigating climate issues, but said movement is not automatic.

B. Legislative and Regulatory Solutions

Another potential way to begin to combat these climate issues and hold companies that deploy and build LLMs liable, is through legislation. Either through legislative amendments or expansion of current regulations, existing legislation could be a conduit to combatting these environmental risks both nationally and regionally. This subpart discusses ways that existing legislation could be used, but does not propose specific legislation.[102]

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99. Abdul, *supra* note 92.

100. Roose, *supra* note 92.

101. Politicians voice calls to action in almost every political campaign, for instance, but this does not mean that individuals always listen or that action always follows.

102. This Article does not address *Loper Bright* issues or matters related to nondelegation, deference, or other similarly situated issues. While subpart II.B. discusses broad authority, which, of course, poses deference-related questions, those issues are beyond the scope of this Article.

The Environmental Protection Agency (EPA) was established in 1970 and consolidated pollution control responsibilities that previously belonged to a few different government agencies.[103] The responsibilities of the EPA developed as Congress continued to enact environmental statutes and amendments to those statutes. The primary responsibilities of the EPA include: "the regulation of air quality, water quality, and chemicals in commerce; the development of regulatory criteria for the management and disposal of solid and hazardous wastes; and the cleanup of environmental contamination."[104] There are a variety of federal statutes that provide the EPA with legal authority to administer its programs and activities.[105] For example, the Clean Air Act provides the EPA with the authority to set ambient air quality standards and standards for new pollution sources; the Safe Drinking Water Act authorizes the EPA to establish drinking water standards; and the Pollution Prevention Act authorizes the EPA to prevent pollution by "reduc[ing] the generation of pollutants at the point of origin."[106] Here, we see the interplay between Congress and a federal agency like the EPA very clearly: Congress writes the legislation, and the EPA carries out the legislation.

1. The Power of an Amendment

There are two ways to combat the environmental harms and hold companies liable with existing legislation and regulations. The first is by Congress writing an amendment to a statute. For example, after a call to action, there may also be advocates calling for an amendment to the Pollution Prevention Act. Under Section 6607, owners and operators of many industrial facilities are required to submit annual reports on their releases of toxic chemicals to the environment.[107] These reports must also include the facility's efforts in "source reduction" and recycling.[108] Source reduction is defined as efforts to reduce the amount of hazardous substances released into the environment.[109] Congress could amend this section and explicitly include companies that build and deploy LLMs, such as Google or OpenAI. Any company emitting a certain amount of carbon dioxide would be included and have to submit a report. This would

103. *See* Cong. Rsch. Serv., RL30798, ENVIRONMENTAL LAWS: SUMMARIES OF MAJOR STATUTES ADMINISTERED BY THE ENVIRONMENTAL PROTECTION AGENCY 2 (2013).

104. *Id.*

105. *See id.*

106. *Id.*

107. *See id.* at 87.

108. *Id.*

109. *See id.*

put the onus on companies to be proactive in tracking emissions and would provide information to the EPA so that they can begin to regulate LLM-producing companies as well.

A Congressional amendment would also draw attention to the issue as a bill must pass both the House and the Senate before it is presented before the president—meaning it has to be introduced; go through committee meetings, markup sessions, and debates; and be voted on. In all of this, there will be press and more attention brought to the issue as debates ensue. It may be possible for the public to hold companies liable as well.

2. The Power of Broad Authority

The second way that existing legislation could be used would be for the EPA to simply adopt strategies or rules relating to LLMs. Most of these statutes are broad in that they specify what the EPA should do, but they are not so specific that the EPA cannot grow and adjust. For example, the Pollution Prevention Act requires the EPA to establish an Office of Pollution Prevention, develop a pollution prevention strategy, and develop source reduction models.[110] Those within the Office of Pollution Prevention could decide that the environmental harms that LLMs pose are important enough for them to address. Or, the EPA may decide to change its pollution prevention strategy or its source reduction models to include specific ways that companies that produce or deploy LLMs could prevent or reduce pollution. This can be done in a way that is within the EPA's authority that Congress already granted. Regulations generally work to address and enforce Congress' plans and could be written with Indigenous peoples' health in mind.

The EPA could also use its broad authority in a manner similar to its current enforcement of the Superfund Liability: Liability could be established for companies that distribute and deploy LLMs with a large carbon footprint or cause other detrimental environmental impacts. The Superfund Liability is established through the "Superfund law" or the Comprehensive Environmental Response, Compensation and Liability Act.[111] Any party responsible for the presence of hazardous substances is held liable.[112] The EPA specifies how liability may be found (e.g., if there is a release of hazardous substances); that it is strict liability, and

110. *See id.*

111. *See Superfund Liability*, ENV'T PROT. AGENCY, https://www.epa.gov/enforcement/superfund-liability (last visited Aug. 18, 2024).

112. *See id.*

retroactive; and the financial penalties that are to be incurred if a party is found liable.[113] This liability could be used as a template to create a similar liability for any company that, for example, in the training or deployment of LLMs, surpasses a specific amount of carbon emissions. Or, building on the examples above of a potential amendment or authority expansion of the Pollution Prevention Act, if companies do not submit the necessary annual reports or audits, or if companies violate rules from the Office of Pollution Prevention, they could perhaps be held liable under this new liability.

Both Congress and the EPA are national entities; thus, the environmental harms that LLMs pose would potentially need to implicate more communities or cause more damage than they currently do before being handled. Additionally, it may be difficult to pass a separate piece of legislation dedicated entirely to LLMs and their harms. Regulations or rules, however, can be very specific. Given the precedent set by the EPA, a rule could be written with a focus on holding companies liable for environmental harms.[114] However, should Congress deem the environmental harms so important that it warrants new legislation, they could use the same model that they employed for other environmental statutes: defining the harms and then authorizing the EPA to open offices and establish standards that could hold companies liable. Nonetheless, a regional legislative response may be more effective.

3. The Power of a Regional Focus

In the same way amendments to laws or expansion of existing authority could be employed with existing national legislation, they could also be used to combat environmental harms regionally. For example, in Alaska, former Governor Walker signed HB1 into law, declaring the Arctic policy of the state. This law ultimately "uphold[s] the state's commitment to economically vibrant communities sustained by development activities consistent with the state's responsibility for a healthy environment."[115] Alaskan legislators could amend this law to explicitly include, for example, research on combatting environmental

113. *See id.* (noting that parties could potentially be liable for government cleanup costs, damages to natural resources, the costs of certain health assessments, and injunctive relief).

114. There are a variety of examples—governmental agencies regularly distribute guidance and policy documents, as well as rules, that specify compliance with legislation and regulations. Examples can be found on the EPA's website. *See*, *e.g.*, *Federal Guidance for Radiation Protection*, ENV'T PROT. AGENCY, https://www.epa.gov/radiation/federal-guidance-radiation-protection (last visited Aug. 20, 2024).

115. ALASKA STAT. § 44.99.105 (2023).

harms that LLMs exacerbate. The law already requires the state to "sustain current, and develop new, approaches for responding to a changing climate, and adapt to the challenges of coastal erosion, permafrost melt, and ocean acidification."[116] Thus, this section could be amended, or those that are currently developing new approaches for responding to climate change could begin to integrate research pertaining to LLMs. A regional response will hopefully ensure that the specific issues that Indigenous populations are experiencing are being addressed (as the proposed amendments or expansion of current policies are occurring directly on the land where they live). Of course, Alaskan legislators can propose entirely new legislation regarding these harms, but given that none of the large companies that build or deploy LLMs are based in Alaska, it may be easier to work with existing legislation and focus on Alaska itself. The companies that build or deploy LLMs would not necessarily be exempt from liability here; in fact, they could still be held liable for any harm or business conducted in the state as is customary in the United States.

However legislation or regulations are used, if companies are to be held liable, there must be an incorporation of not only liability, but also of Indigenous communities and their rights. Environmental impact assessments, such as the reports that must be made pursuant to the Pollution Prevention Act, are one way that companies could be held and found liable for the environmental harms that Indigenous communities experience, and that they exacerbate through the development and deployment of LLMs. The solutions discussed in this subpart could also interplay with the federal trust responsibility and the affirmative duty it imposes. This responsibility could force the government to act, and the government may decide to do so through the expansion of current statutory authority or through regulations and rules. Yet even without the trust relationship, currently enforced statutory or regulatory authority could be expanded with a focus on the environment, Indigenous rights, and company liability.[117] These environmental harms could thus be addressed through a legislative or regulatory solution.

V. CONCLUSION

LLMs are inarguably useful: They can generate and understand language, media, and code. However, as they grow in popularity and size,

116. *Id.*

117. Of course, new legislation could be drafted, but that is not the focus of this Article, nor is it likely without significant public support or a national crisis.

so do the environmental harms—just the training of an LLM could rival the carbon emissions of the full life spans of five average cars. Thus, while discussing the usefulness of LLMs, it is also important to highlight the impact on the environment, as well as those that are impacted the most. Indigenous communities, already feeling the first effects of climate change, should not suffer at the hands of innovative technology and their companies. Whether the trust relationship becomes reliable, or there are calls to action, legislative amendments, or regulatory expansions, the impact that LLMs have on Indigenous communities must be discussed, and companies that build and deploy LLMs must be held liable.