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Conducting Water And Energy Audits To Circumvent The Impacts Of AI On The Environment

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SUMMARY

In California and across the US, data centers are rapidly expanding to meet the growing market for new forms of Artificial Intelligence (AI). With this expansion comes increased energy and water use, air and noise pollution, and added carbon emissions to power these centers. The health implications of AI's environmental impact is damning, with total public health costs from pollution-related asthma, cancers, and other diseases approaching an estimated \$20 billion per year. This proposal emphasizes the need for environmental regulations and reporting requirements on existing and proposed data centers' energy and water usage. The proposed solution mandates publicly available energy audits, along with analysis of these reports to inform future policy related to zoning ordinances and renewable energy requirements. Within this, limits must be set on proposed data centers to ensure sustainable use of California's limited water resources and a reduction in pollutants that adversely affect the health of surrounding communities.

BACKGROUND

Data centers across the United States have had rapid expansion and are largely unregulated, causing environmental and public health risk. Developers of artificial intelligence (AI) infrastructure are placing these data centers in low-income,

underrepresented, and politically marginalized communities. This pattern mirrors historical environmental injustices such as Louisiana's "Cancer Alley," where industrial facilities were deliberately clustered in communities with the least political power to oppose them. These data centers use natural-gas turbines or diesel backup generators to maintain constant uptime, leading to emissions of nitrogen oxides (NO_x), particulate matter (PM_{2.5}), and other hazardous pollutants which can worsen air quality, increasing exposure to asthma pollutants, cardiovascular disease, and certain cancers.

Training and operating large AI models demand immense and continuous electricity, forcing data centers to rely heavily on fossil-fuel backup systems. The impact of these data centers on public health have received little systematic evaluation and little regulation. For example, data centers create noise pollution, 85 dBA above what the harmful threshold is. Elon Musk's AI center in Memphis, Tennessee (which has no Clean Air Act permits) has spewed 1,200 to 2,000 tons of nitrogen oxides and multiple residents have stepped up attributing air pollution as the source of their asthma. His company is located in an area where 90% of the residents are Black and the median household income is \$36,000. This is just one of the examples of data centers that benefit from causing harm to the environment and public health.

PROBLEM

Our growing reliance on AI technologies is creating the need for more large-scale data centers, which house the software needed to run and train AI models. While technological advancement is important, these AI-associated data centers use energetically costly generators, requiring mass amounts of water to stay cool. Beyond this are the public health implications of these centers, which are increasing air pollution both in the communities they reside and across county and state lines.

With little to no regulations on energetic costs, the electricity from power plants and backup generators needed to train AI models is on target to exceed air pollution produced by all other sectors, even transportation. Perhaps the largest concern is the release of particulate matter, particularly PM_{2.5}, which when inhaled can get into an individual's lungs and bloodstream, posing major risks to human health. Recent studies have shown that training one generative AI model can produce as much PM_{2.5} as more than 10,000 round trips by car between New York City and Los Angeles. These mass amounts of particulate matter can trigger various health conditions. These include asthma, heart attacks, and even cognitive decline. Air pollution claims approximately 4 million lives per year.

Additionally, the significant amount of water used to cool machines running AI models worsens water scarcity in already vulnerable areas. This is especially impactful in California due to recurring drought, the likes of which is set to increase in frequency and severity as climate change progresses. Inadequate clean water supply poses not only major public health challenges, but a massive economic burden on the state of California. The almost nonexistent use of renewable energy sources to run these centers will only exacerbate the

drought-conditions fueled by climate change, creating a positive feedback loop that disproportionately impacts low-income communities and communities of color.

The lack of standards for tech companies to collect and report data on the air pollution their centers are releasing exacerbates these problems. Without firm guidelines to control AI's growing energy demands and pollution, new and existing data centers can progress unchecked and continue to negatively impact the health of communities in California and beyond. To cut down on billions in public health costs and to protect the lives of those facing pollutant-related disease and water scarcity, there must be a system in place to balance the advantages and costs of technological advancement.

SOLUTION

Regulatory constraints and mandated reporting for existing and proposed centers must be established to tackle the environmental impact of AI data centers. Under this proposition, all large data centers would be required to conduct regular water and energy usage audits, with publicly accessible results to establish trust and transparency within local communities. These reports are to be analyzed by the California Water Board and the Energy Commission. They will evaluate the environmental impacts which include contributions to water consumption, air pollution, and the overall carbon footprint of individual facilities. Based on the data, policymakers could implement specific solutions such as enforcing renewable energy requirements, zoning restrictions to prevent disproportionate clustering in vulnerable communities, and setting emissions limits for all data centers. Additionally, the data could inform long term planning, helping the state focus on investments in sustainable infrastructure to

ensure that AI development doesn't come at the expense of public health or environmental justice.

PRECEDENT

Some similar legislative bills have already been passed in California related to mandated environmental reports, as well as proposed legislation on the federal level. A few of these bills are listed below:

SB 253 (Approved October 2023)

- Climate Corporate Data Accountability Act
- Companies with revenues over \$1 billion must report their Scope 1, 2, and 3 greenhouse gas (GHG) emissions publicly.
- Emissions will be measured across Scope 1 (direct emissions from owned operations), Scope 2 (purchased energy consumption), and Scope 3 (all supply chain emissions).
- CARB (California Air Resources Board) may fine companies up to \$500,000 per year for failure to submit reports on time or violating reporting rules after a formal hearing.

SB 261 (Approved October 2023)

- Climate-Related Financial Risk Act
- Companies with revenues over \$500 million must biennially disclose their climate-related financial risks.
- This includes but is not limited to direct and indirect emission from suppliers and purchased energy.
- These reports must be publicly available and consistent with current energy standards.

- CARB may set reporting deadlines and impose penalties for inaccurate data.
- Emphasize transparency on how energy consumption affects California communities.

H.R 9671 (Introduced September)

- Department of Energy Artificial Intelligence Act of 2024
- Directs the Department of Energy to advance development of technology related to energy systems and stresses responsibility upon institutions on the use of AI.
- Investments in responsible AI practices, promoting downstream benefits in service capabilities
- Aims to eliminate bias in intelligence systems with respect to security, energy and scientific applications

S. 3732 (Introduced February 2024)

- Artificial Intelligence Environmental Impacts Act of 2024
- Requires the US Environmental Protection Agency to study AI's environmental impacts.
- Directs the National Institute of Standards and Technology to bring together stakeholders and establish a voluntary framework for organizations to disclose environmental effects of their AI systems.

FISCAL ANALYSIS

Due to the nature of the proposal and of preexisting departments and infrastructure, this policy is unlikely to generate a significant fiscal impact. Tools and equipment are already in place to support this implementation, and minimizes the need for additional expenditures.

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