

# The Health and Environmental Costs of Artificial Intelligence

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Generative artificial intelligence (AI) has rapidly integrated into everyday life, offering immediate assistance with tasks ranging from composing emails to generating personalized recommendations. Its utility is undeniable, streamlining communication, increasing efficiency, and supporting decision-making across disciplines, including medicine. However, this convenience is not without consequence. Each AI-generated query, document, or image carries an often-overlooked environmental and public health cost that warrants critical attention from the health care and scientific communities.

For the first time in decades, national energy demand is increasing. This is largely driven by data centers used for AI computing. By 2028, AI-related energy use is projected to equal the amount needed to power 22% of US households annually, despite technology efficiency gains.<sup>1</sup> Closer to home, in Mount Pleasant, Wisconsin, Microsoft's new data center could require the same energy needed to power 300,000 homes, surpassing the number of homes in the cities of Milwaukee or Madison.

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To meet this demand, utilities—including We Energies, Wisconsin's largest electric utility—are proposing new fossil fuel power plants. Air pollution from fossil fuels is well-documented to exacerbate asthma, cardiovascular disease, and premature mortality, all while driving climate change. One proposed plant in Oak Creek, Wisconsin, alone is esti-

Beyond air pollution, AI's infrastructure consumes vast quantities of water for cooling servers. To generate just eight short emails, a large language model like ChatGPT-4 requires 4.15 L (approximately 1 gallon) of potable water. Multiplied across more than 1 billion daily queries, the collective toll is staggering. In 2021, Google data centers in The Dalles,

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mated to impose up to \$144.8 million annually in health-related costs, in addition to higher electricity bills to cover the cost of the facility.<sup>2</sup> This coincides with increasingly severe climate-related events in Wisconsin. For example, smoke from the 2023 Canadian wildfires resulted in some of the poorest air quality measurements in the world. Smoke returned to Wisconsin in July 2025, when Milwaukee, Beloit, Rhinelander, Madison, Waukesha, and Green Bay accounted for 6 of the 10 US cities with the most hazardous air quality. Shortly thereafter, historic floods in Milwaukee destroyed 51 homes and caused an estimated \$76 million in damages. It is clear that Wisconsin residents are already experiencing the health effects of climate change, and soon, the rapid growth of AI-related energy demand may further exacerbate these effects.

Oregon, consumed more than 355 million gallons of water, representing more than one-quarter of the city's annual water consumption. Additionally, an estimated 20% of data centers rely on watersheds that are already moderately to highly stressed.<sup>3</sup> Because current cooling technologies rely mostly on potable water, it's no surprise that the Great Lakes region is becoming a target for data center expansion. With the Great Lakes water levels lowering in recent years, partly because of climate-related factors, Wisconsin residents will need to carefully consider how much to risk this valuable resource.

Data center development also raises questions of equity in resource allocation and environmental justice. Proposed facilities are often where land may be less expensive and regulatory oversight weaker. These areas

can be both rural, such as Caledonia where a proposed data center would have required approximately 244 acres currently used for agriculture, or urban, such as Port Washington, which will house the nation's largest data center and require power consumption equivalent to that of Los Angeles, the nation's second-largest city. However, in Caledonia, Microsoft withdrew its proposal there in late 2025 after sustained local opposition, demonstrating that people coming together can still change the course of these projects.

Although water stress depends on where a data center sits, the fossil-fuel emissions required to power these centers originate at power plants scattered across Wisconsin. In addition to the global climate effects of carbon dioxide, these plants release mercury, fly ash, and other particulates and carcinogens that have localized health effects, worsening asthma, cardiovascular disease, and cancer risk.<sup>4</sup> These exposures exacerbate existing health disparities and place both rural and urban residents at risk, even when the data center itself is miles away. The growing footprint of these facilities, along with their consumption of shared natural resources, forces a deeper reckoning with who benefits from AI infrastructure and who bears its costs.

Nonprofit and for-profit initiatives signal recognition of the problem, but their impact is limited. The National Academies convened experts across fields to form the Roundtable on Artificial Intelligence and Climate Change to foster collaboration; however, whether or not this think tank will result in tangible outcomes, such as policy or technological innovation, is unclear.<sup>5</sup> As communities push back against proposed projects, companies are increasingly trying to distance themselves through greenwashing—a tactic to appear environmentally responsible to deter public outrage and regulation, but with limited implementation plans or failure to address the full scope of the problem. For example, Google now discloses site-level water use and promises to replenish 120% of its consumption by 2030. However, its data is self-reported, and data centers often use village and municipal water supplies to avoid more trackable and transparent water permits. Additionally, the Green Software

Foundation, a collaboration that includes Microsoft, promotes “carbon-aware” computing allowing AI tasks to be timed or moved to places where cleaner energy—such as solar or wind—is more available. However, overall, these approaches are distant, rely on questionable offsets, and do little to decarbonize the electrical grid as a whole.

As stewards of public health, health care professionals must engage in paving the path forward. We can help educate the public and advocate for accountability among developers and policymakers. We can also advocate for renewable energy and solutions that optimize resource use justly, closing health disparities rather than widening them. One starting point is engaging collectively through state organizations already working on this issue, such as Healthy Climate Wisconsin. Additionally, those of us using AI can adopt more intentional usage patterns by limiting nonessential queries and recognizing the hidden costs associated with convenience. As AI continues to expand, it's clear that the path to a sustainable, health future must include widespread regulation of the technology sector to protect communities from rising energy bills, adverse health effects, and environmental harms. The growing climate crisis also requires that we also collectively ask ourselves tough and uncomfortable questions, including whether convenience is truly worth the consequences.

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