

AI Data Centers: What Communities Should Know



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What are AI data centers?

Artificial Intelligence (AI) is a broad term usually used to describe technology that allows computers to simulate human learning, problem solving, and decision making. Common AI tools include ChatGPT, Claude, Gemini, Copilot, and Grok. For AI tools to work, they require data centers, which are facilities that store the physical infrastructure - like servers and networking equipment - that powers websites and digital services. For these services to work, the data centers that power them need to run continuously. While data centers have been around for much of the internet age, AI technologies require a larger amount of computing power, and the recent boom in these technologies has meant that they require more, and more powerful data centers than ever before.



While people everywhere may use tools that require AI data centers, the data centers themselves are often clustered around certain areas. In 2024, 15 states (Arizona, California, Georgia, Illinois, Iowa, Nebraska, Nevada, New Jersey, New York, North Dakota, Oregon, Pennsylvania, Texas, Virginia, and Washington) accounted for 80% of the US data center load¹.

AI data centers aren't necessarily located at or near the business operations of the companies that own them. They can be in urban, suburban, and rural areas. They typically look like office buildings or warehouses, without clear identifying features from the outside.

While AI technologies may be useful and convenient, AI data centers pose potential health hazards for people near them.

¹ <https://www.visualcapitalist.com/mapped-data-center-electricity-consumption-by-state>

AI data centers use a lot of resources

The significant computing requirements for AI tools mean that AI data centers are very resource-intensive. This can create concerns about deterioration of our precious natural resources as well as concerns about utility costs for nearby residents.

Electricity

Because of their computing requirements and the fact that they run 24 hours a day, AI data centers use a lot of electricity, which they typically get from the local power grid. In 2023, data centers consumed about 4% of total electricity in the US², and are projected to use as much as 12% by 2028³. In Virginia, with the highest concentration of data centers, they account for 25% of the state's electricity usage⁴.



This rising demand for electricity can put strain on the local electric grid, especially during peak hours or times of year. As a result, electricity costs in areas with AI data centers increase. Electricity costs in Virginia have increased as much as 267% between 2021 and 2026⁵. Since data centers are typically charged an industrial rate by electricity utilities, which is lower than the residential rate, local residents end up bearing a disproportionate burden of these increased costs.

Fresh water

Computer chips generate heat when they function, and because AI data centers have thousands of computer chips, they generate a lot of heat, which can damage the chips. To prevent damage, AI data centers need to be cooled, and most are cooled using water. Because salt and impurities can also damage equipment, AI data centers use fresh water for cooling.

2 <https://www.visualcapitalist.com/mapped-data-center-electricity-consumption-by-state>

3 <https://bies.lbl.gov/news/berkeley-lab-report-evaluates-increase-electricity-demand-data-centers>

4 <https://www.visualcapitalist.com/mapped-data-center-electricity-consumption-by-state>

5 <https://www.bloomberg.com/graphics/2025-ai-data-centers-electricity-prices>

Many AI data centers use an evaporative cooling system, where the hot air generated by the computer chips is pushed into contact with water. The hot air causes the water to evaporate, which lowers the temperature of the air. (This is the same process that at-home swamp coolers use). About 80% of the water used in AI data centers for this type of cooling evaporates and isn't used again. Some other cooling systems - like closed-loop cooling or direct-to-chip liquid cooling - use less water, but use much more electricity and may be impractical for large data centers^{6,7}. The exact amount of water used depends on specifics of the facility, its location, the regional climate, and water availability.

Large AI data centers can use up to 5 million gallons of freshwater per day, the equivalent of 10,000-50,000 homes. In 2025, it was reported that a Microsoft data center in Goodyear, Arizona used 56 million gallons of fresh water a year, the equivalent of 670 households⁸. In 2021, Google was sued to disclose the amount of water it used at its data center in The Dalles, Oregon, which turned out to be 25% of the city's annual water usage⁹.

In addition to using fresh water, AI data centers can also hinder the environment's ability to replenish water resources. The physical footprint of these buildings and their associated structures prevent rainwater from penetrating the ground, so underground aquifers can't be replenished. Instead, the rainwater causes stormwater runoff, potentially flooding nearby areas¹⁰.



6 <https://www.americanrivers.org/rivers-and-data-centers>

7 <https://www.eesi.org/articles/view/data-centers-and-water-consumption>

8 <https://www.apmresearchlab.org/10x/data-centers-resource>

9 <https://andthewest.stanford.edu/2025/thirsty-for-power-and-water-ai-crunching-data-centers-sprout-across-the-west>

10 <https://www.americanrivers.org/rivers-and-data-centers>

Health hazards from AI data centers

AI data centers can emit many types of pollution that can pose hazards to human health.

Air pollution

The intensive energy usage of AI data centers causes emissions of dangerous pollutants into the air. When data centers get their electricity from fossil fuel-powered power plants, their significant demand for that electricity increases the fossil fuel usage at these power plants, causing more pollution.



Air pollution can also be generated at the locations of AI data centers themselves. Because these data centers require a continuous supply of electricity, they typically have on-site generators to power them in case there is an outage of the local electrical grid. These generators tend to be powered by fossil fuels, so running them releases pollutants into the air. Sometimes, the local grid doesn't provide enough energy to a data center, and it may use these on-site generators full-time to provide some of the needed electricity^{11,12}. In 2025, it was discovered that an xAI data center in Memphis, Tennessee was operating over 30 daily use natural gas turbines to provide some of the power to the facility even though it didn't have a permit to do so¹³.

Whether fossil fuels are being consumed at the local power plant or on-site at the data center, they emit toxic pollutants into the air that can cause harm to nearby residents who breathe that air. The most commonly emitted pollutants from burning fossil fuels are carbon dioxide, sulfur dioxide, methane, nitrogen oxides, and particulate matter. Breathing air contaminated with these chemicals can cause respiratory disease, heart disease, asthma, cognitive impairment, and kidney dysfunction. For people who already have these conditions, exposure can exacerbate them¹⁴. A 2026 study found that on-site power at an AI data center in Loudoun County, Virginia could result in up to \$99 million per year in health-related damages due to premature death, respiratory disease, and cardiovascular disease¹⁵.

11 <https://www.wri.org/insights/us-data-center-growth-impacts>

12 <https://www.staxengineering.com/stax-hub/the-environmental-impact-of-data-centers>

13 <https://www.techintell.com/elon-musk-xai-supercomputer-memphis-pollution-crisis>

14 <https://wwwn.cdc.gov/TSp/ToxFAQs/ToxFAQsLanding.aspx>

15 <https://www.pecva.org/resources/press/press-release-new-study-finds-on-site-power-at-virginia-data-center-could-result-in-53-million-99-million-in-annual-health-damages>

Heat and climate change

AI data centers can contribute to climate change. When they are powered by the electric grid, 56% of that electricity comes from fossil fuels¹⁶. When they are powered by on-site generators, those generators are usually powered by fossil fuels. This fossil fuel usage emits potent greenhouse gases. The increasing number and scale of AI data centers raise the potential for them to be significant contributors to climate change.

In addition to their global impact on climate change, AI data centers may have immediate, local effects on temperature. One recent study of AI data centers worldwide found that local surface temperatures increase 2oC after a data center begins operations. The study estimates that over 340 million people may be affected by these changes in temperatures¹⁷. Increased surface temperatures raise the risk of heat exhaustion and heat stroke. These can be fatal, especially in those who are elderly or have other conditions¹⁸.

Water contamination

The construction of new AI data centers can contaminate local water sources. In 2026, wastewater from the construction of a new Meta data center in Cheyenne, Wyoming contaminated the city's wastewater network with a rare bacteria. While the bacteria did not enter the city's drinking water, the wastewater network that was contaminated is used for things like irrigation. That means that local residents could be exposed to the bacteria from this contamination of the city's wastewater network. The bacteria is dangerous to people with weakened immune systems, potentially causing pneumonia, blood infections, and lung infections¹⁹.



The presence of AI data centers can also contaminate local waterways. As their physical footprint prevents rain from penetrating the ground and creates stormwater runoff, that runoff collects pollutants that are on the ground - like motor oil or pesticides - and washes them into streams, rivers, and lakes.

16 <https://www.eesi.org/articles/view/data-centers-and-water-consumption>

17 <https://arxiv.org/abs/2603.20897>

18 <https://www.epa.gov/heatislands/what-are-heat-islands>

19 <https://www.forbes.com/sites/victoriaforster/2026/07/09/meta-ai-data-center-linked-to-rare-bacteria-in-citys-water-system>

Noise pollution

The construction of new AI data centers causes a lot of noise. The operation of AI data centers can also cause noise, with some nearby residents reporting constant buzzing or humming audible from their homes. Excess noise can have potential harmful effects on humans and is called noise pollution. The World Health Organization considers noise pollution to be one of the worst environmental stressors for humans. It can cause physical conditions like heart problems, metabolic disturbances, high blood pressure, and adverse birth outcomes. It can also have psychological effects like decreased sleep, cognitive impairment, irritability, and changes in social behavior²⁰.

Fires

AI data centers can also pose hazards to human health from the accidents that can happen there. These facilities can pose a major fire risk. A local firefighter and member of the International Association of Fire Chiefs testified in the Texas legislature about a 2024 data center fire in Roundrock, Texas that was so extreme it took 44 firefighters 5 hours to contain it. It can take 1 million gallons of water to suppress a data center fire, which rural communities may not have the resources for²¹.



In addition to the risks from fires themselves, there are other human health hazards to communities when AI data centers catch on fire:

- Carcinogens and other toxins released in the fires are carried through smoke and firefighting water to the surrounding community.
- Firefighting foams may contain per- and polyfluoroalkyl substances (PFAS), a class of chemicals that can cause cancer and reproductive harm²². These chemicals persist for a long time in the environment, so many people could be exposed to them.
- Fires release dangerous metals that may be in computer chips - like lead, cadmium, gallium, copper, nickel, and aluminum - into the air, water, and soil where people could be exposed to them.

20 https://www.who.int/europe/health-topics/noise#tab=tab_1

21 <https://www.facebook.com/watch/?v=869307262912627>

22 <https://www.atsdr.cdc.gov/pfas/about/health-effects.html>

AI data centers are a justice issue

The construction and operation of AI data centers is a justice issue. Many AI data centers are built near vulnerable communities that have already faced a disproportionate amount of environmental toxins, burdens, and stressors in our society. Often, data centers operate without nearby vulnerable communities having any input or knowing about the potential harm. The xAI data center in Memphis, Tennessee is in a low income, predominantly Black area, and residents say they had no idea it was operating and polluting their air without a permit²³. While local communities bear the burden of the environmental costs of AI data centers, the economic benefits are concentrated among a handful of tech companies and their CEOs.

In addition to overburdened communities, rural and unincorporated areas face the issue of structural power. Rural and unincorporated communities may have fewer local protections, less regulatory authority, and fewer government resources to evaluate or shape major industrial development. All communities should have meaningful information and a meaningful voice before decisions are made about data centers that can place significant demands on local water, energy, land, and emergency services.

What can you do?

If you'd like to learn more about AI data centers or are concerned about the impact of an AI data center in your community, there are things you can do.

Get a baseline of your environment

If you're concerned about a potential or proposed AI data center being built in your community, it can be helpful to have a baseline of your environment before it gets built:

- **Toxic chemicals:** at-home outdoor air monitors like those from [PurpleAir](#) are easy to install to measure common chemicals of concern that may be emitted from data centers. Local nonprofits and universities may have grants to help pay for these monitors.
- **Noise:** the National Institute for Occupational Safety and Health has [a free app](#) to accurately measure noise levels. Record noise levels in and outside your home at different times of day to create a snapshot of the baseline noise in your area.
- **Utility costs:** start a spreadsheet or list of your monthly electricity and water bills, so if a data center is built you can easily compare how your costs change.

²³ <https://www.techi.com/elon-musk-xai-supercomputer-memphis-pollution-crisis>

Find data centers and learn what other communities are doing about them

If you'd like to find AI data centers across the country and learn about what local communities are doing to combat them, these resources can help:

- <https://www.brockovichdatacenter.com/index.html>
- <https://www.fractracker.org/data-centers>
- <https://www.datacenterwatch.org>

Community organizing tools to oppose a data center in your area

If you'd like to stop an AI data center from being built in your community, these resources can help:

- <https://datacenters.halttheharm.net>
- <https://www.fairshake-els.org/datacenters>
- <https://www.fairshake-els.org/blog/2026/5/6/challenging-data-centers-101>
- EPN Data Center Resource Directory Dashboard:
<https://datastudio.google.com/u/0/reporting/16c72341-1de3-4418-a825-3bedca7c9868/page/5s52F>

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