



SMART ENERGY
CONSUMER COLLABORATIVE

MAKING SENSE OF AI DATA CENTERS AND ENERGY

As more people and organizations use artificial intelligence, AI data centers are becoming an important part of the technology that powers many digital services. Understanding how they work can help you evaluate information, ask questions, and engage in discussions about their development and impact.

The Growth in AI Infrastructure

More than half of American adults actively use AI tools like ChatGPT, Gemini, and Claude.¹ However, because many websites and apps increasingly rely on AI, nearly all Americans use it regularly, often without realizing it.²

To support this rapid growth, tech companies must build specialized AI data centers. Unlike traditional data centers that primarily store and retrieve data – such as a bank server room or a Netflix streaming hub – AI facilities must process massive pools of information in real time to train models* and power real-time applications.

These facilities range from giant “hyperscale” centers that train smart AI models down to smaller “edge” centers closer to cities that ensure instant responses when you ask a question or use real-time map navigation.

Because processing AI workloads requires significantly more computing performance, these specialized facilities require vast amounts of power, space, and intensive cooling. Driven by the rapid rollout of AI, the combined power demand of all U.S. data centers is projected to more than double in two years, climbing from 31 gigawatts (GW) in 2025 to 66 GW by 2027.³

AI data centers:



House large numbers of computer servers



Support AI applications and services



Consume large amounts of electricity



Require advanced cooling systems



Operate around the clock



Vary widely in size and design, from a single warehouse-sized footprint to multi-building campuses



May be funded in a variety of ways



¹ [Pew Research Center \(September 2025\), "How Americans View AI and Its Impact on People and Society"](#)

² [Gallup \(January 2025\), "Americans use AI in everyday products without realizing it."](#)

* An AI model is a trained mathematical system, like an application or a digital brain. It has been trained on enormous amounts of information so it can answer questions, write content, analyze data, and make predictions.

³ [Goldman Sachs \(May 2026\), "US data center power demand projected to double by 2027."](#)

AI DATA CENTERS VS. TRADITIONAL DATA CENTERS

Feature



Traditional Data Centers



AI Data Centers

Main Job

Store data, host websites, run basic software.

Train AI systems and handle AI requests.

Power Use

Lower power needs per server rack* (typically 5–15 kW, roughly enough to power 4 to 12 average homes simultaneously). Power use is consistent.

Extremely high power needs per server rack* (often 40–100+ kW, enough to power 30 to 80+ average homes simultaneously). Power use is highly variable.

Cooling Method

Primarily air conditioning (chilled air blown through the room).

Advanced liquid cooling (liquid running directly over chips to absorb intense heat).

Workload

Steady, predictable streams of data.

Massive, intense bursts of data processing that run continuously for weeks.

*A server rack is a specialized metal frame designed to hold and organize multiple computer servers. An AI rack is roughly the size of a large refrigerator, but, electrically, it behaves more like a small commercial building.

FREQUENTLY ASKED QUESTIONS

Consumers often have questions about how AI data centers may affect their community. The following FAQs address common topics, such as electricity consumption, costs, environmental impacts, and the potential benefits to the local community.



How does the electricity demand from AI data centers affect the power grid?

AI data centers can increase demand for electricity. The impact on the power grid depends on factors such as how much power is needed, the capacity of the local grid, and whether new power generation or grid upgrades are added to meet the demand. In some areas, utilities may need to make infrastructure investments to support growth in electricity use, while, in other areas, the grid can accommodate these new energy-intensive additions.

Who pays for the electricity used by AI data centers and any required upgrades to the grid?

In most cases, the owner or operator of the data center pays for the electricity the facility uses, just as a factory, office building, or hospital pays its electric bill. The more complex question is who pays for the infrastructure needed to deliver that electricity.

If a new substation, transmission line, other grid upgrade or even a new power plant is required, costs may be assigned to the data center, shared among multiple customers, recovered through utility rates, or funded through some combination of these approaches, depending on local regulations and utility policies.

Because funding arrangements vary, consumers who want to understand a project in their area can ask who is paying for the facility itself, who is paying for related infrastructure upgrades, and whether any public funds, tax incentives, or utility rate increases are involved.

FREQUENTLY ASKED QUESTIONS CONT'D.

Will a data center affect my electricity bills?

The effect on utility bills depends on many factors, including how electricity costs are allocated, changes in demand, utility investments, and decisions made by regulators. Impacts vary by community and utility service area. Rate decisions generally rest with state public utility commissions, except for areas served by municipal utilities, rural electric cooperatives, or public power districts, where locally elected boards make the final call.

What impact do AI data centers have on the environment?

AI data centers use significant amounts of electricity and water to power and cool their computer equipment. Their environmental impact includes increased energy demand, water use and displacement, and, depending on the source of electricity, greenhouse gas emissions.

At the same time, many data centers are designed to improve energy efficiency and may use renewable energy, battery storage, recycled water, or other technologies intended to reduce environmental impacts. The environmental effects of a particular AI data center depend on factors such as its size, location, design, cooling systems, and energy sources. As a result, impacts can vary considerably from one facility to another. While federal and state agencies set baseline air and water quality standards, primary jurisdiction over local environmental impacts – such as zoning, land use, noise ordinances, and water allocation – rests with city councils and county boards.

What benefits, if any, might AI data centers provide for the communities in which they are built?

Proponents of AI data centers point to benefits such as an expanded local tax base, which can help fund public infrastructure, schools, and emergency services. Development also generates economic activity through job creation, ranging from high-volume temporary construction work to long-term technical and facilities roles.

In addition, developers sometimes pay directly for local electric grid, power station, or water line upgrades to support their operations. Some companies buy long-term power from solar, wind, or nuclear projects to support local clean energy. Some might partner with community colleges or trade schools to provide equipment and training grants.

Such benefits are highly variable. How much a community actually gains from a data center depends on local tax laws, company tax breaks, and the specific agreement local leaders negotiate with developers.



FREQUENTLY ASKED QUESTIONS CONT'D.

What power sources are available or emerging that may be able to address the demands of data centers with lower cost and fewer environmental impacts?

To meet growing energy demands with fewer environmental impacts and lower consumer costs, developers and energy experts are looking to solutions like distributed energy resources (DERs), virtual power plants, and large-scale battery storage. These solutions could potentially prevent new fossil-fuel generation plants from needing to be built to supply data centers.

DERs – which include battery systems, smart building controls, and managed electric vehicle charging – generate, store, or manage electricity close to where it is consumed. When these individual systems are networked together through software, they form virtual power plants (VPPs). VPPs allow grid operators to coordinate many small energy sources to supply power or reduce demand during peak hours, creating a flexible alternative to traditional power generation.

In addition, outfitting data centers directly with on-site battery storage allows facilities to participate in these networks or operate independently during peak demand periods. Rather than relying on constant new generation capacity, data centers can store energy when grid demand is low and draw from batteries when demand spikes. Experts indicate this approach can strengthen grid stability, lower overall electricity bills, and curb emissions.⁴

QUESTIONS TO ASK ABOUT A PROPOSED AI DATA CENTER

If an AI data center is proposed in your community, here are some questions to ask your elected officials, electricity provider, project developers and other stakeholders.

- How much electricity will the data center use?
- Will the electricity come from existing power plants, new generation, renewable sources, or a mix of sources?
- Have you evaluated whether clean energy sources like solar+storage or DERs could be used to generate the power the data center needs?
- Will grid upgrades be needed to maintain reliable service?
- Who will pay for those upgrades?
- How could this affect electricity rates?
- How will you make sure costs are shared fairly?
- Will the data center reduce its electricity use during extreme weather or other times when the grid is under stress?
- How will electricity usage and impacts be monitored and reported to regulators and the public?
- What impact will the facility have on our water supply?
- How will the facility affect air quality in the community?
- What steps will be taken to address environmental concerns? Who has jurisdiction?
- What value will the community receive from this project?
- How long is the data center expected to remain in this location? Will its impact to our community change over time?

⁴ [Deaton, J. \(2025, November 19\). How batteries, not natural gas, can power the data center boom. Yale Environment 360](#)

LOOKING AHEAD

As demand for AI grows, the technology behind AI data centers continues to evolve, with improvements in energy efficiency, cooling systems, and performance. At the same time, communities, companies, utilities, and policymakers are working to balance technological innovation with priorities such as reliable electricity, water resources, economic development, environmental health, and quality of life. Understanding the issues and asking informed questions can help you engage constructively in discussions about how these facilities may affect your community.

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