Photo credit: Paloma Ayala

COLUMBIA RIVERKEEPER®

Data Centers
Background Brief

FALL 2025

Photo credit: Paloma Ayala

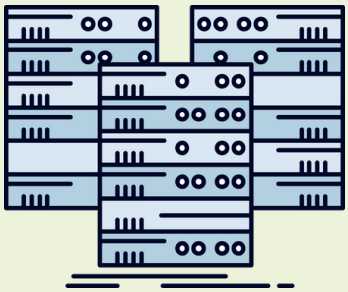
What are data centers?

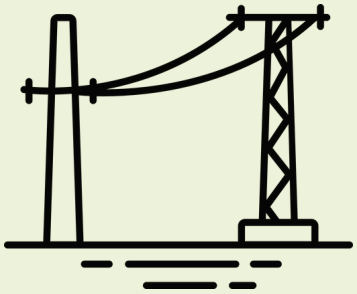
Data centers are networks of computer processors that form a key part of the physical infrastructure that supports digital functions, like cloud storage, end-user connectivity, and AI computing.

- AI-specialized data centers cluster processors closer together to accelerate communication, which requires more cooling.
- Data centers range in size from a single room in an office building to massive, "hyperscale" campuses.
- AI-specialized "hyperscale" campuses can draw as much as 1 Gigawatt (GW) of electricity load.
- A typical size for a new data center is between 50 and 150 Megawatts (MW).
- "Capacity" refers to the maximum amount of electricity a data center can draw at any given time. For example, a 100 MW capacity data center can draw 100 MW. If that same data center draws 100 MW electricity constantly for one hour, it uses 100 Megawatthours (MWh) electricity. Over the course of a year, data centers generally consume 70 percent of their maximum capacity.[1]

By the numbers...

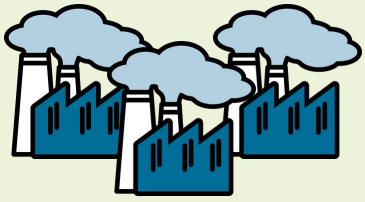
Every year, a 100MW data center will consume 613,200 MWh of electricity

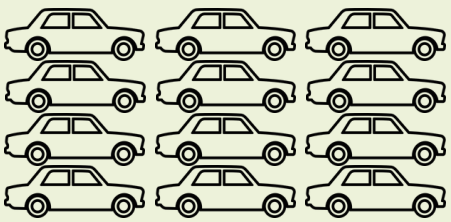




which could power more than 56,000 homes, and 100 million gallons of water, enough for 25,000 people's domestic use

If powered by gas, it will emit 275,000 tons of CO2, which is equal to 60,000 cars on the road for a year.





Why should you care about expansion?

Data centers require an enormous amount of electricity and water to power and cool the processors.

- Over the course of a year, a 1 GW data center campus consumes over 6.1 million MWh of electricity, **enough to power all the households in Portland for two years.** [2]

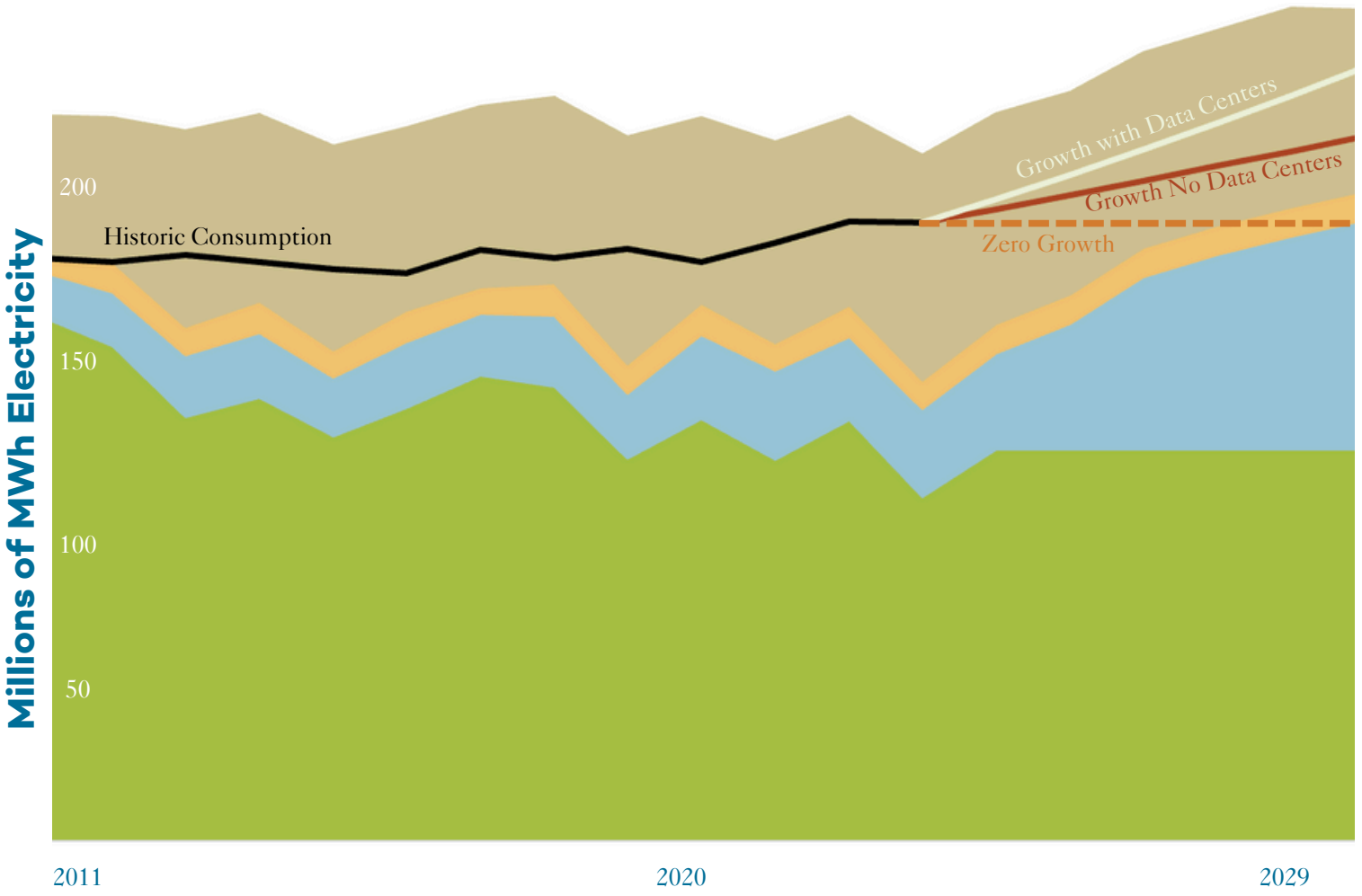
- The entire capacity of the data center industry in the Pacific Northwest was 2.2 GW in 2023, and **could nearly triple to 5.6 GW by 2030.** [3]

- A 1 GW campus consumes about 1 billion gallons of water per year,[4] **equivalent to the annual domestic water use of 25,000 people.**[5]

- Data centers produce **wastewater laced with contaminants and pollutants** not normally targeted for removal by wastewater treatment plants.[6,7]

- Data center operators have **resisted efforts** to make public water use and impact data.

Data Center Proliferation Threatens Pacific Northwest Clean Energy Goals



Key

- Hydro
- Wind / Solar
- Nuclear
- Gas / Coal

Data center proliferation will dramatically increase electricity consumption, straining our infrastructure and running counter to clean energy goals.

Data Center Growth Locks in Continued Burning of Fossil Fuels

The Pacific Northwest (PNW) consumed 189 million MWh of electricity in 2023. If electricity demand stayed the same, the PNW would be able to meet demand with little to no fossil fuels or nuclear.

- But electricity demand is projected to increase by 25 percent by 2029, to 236 million MWh. By themselves, **data centers account for almost half of the new demand.**

- **Electricity generation from gas, coal, and other carbon-emitting sources is currently projected to decline** by 20 percent from 2023 to 2029.

- **Wind, solar, and battery electricity generation is projected to more than double** from 2023 to 2029, but unrestrained data center proliferation would outpace planned growth.

- **Hydroelectricity generation is not as reliable** as it used to be. It has declined over the last decade, from over 68 percent of PNW generation in 2012 to just 50 percent in 2023.

- **If data center demand stayed the same,** the PNW could reduce electricity generation from carbon-emitting sources by 75 percent from 2023 levels and still meet projected 2029 regional electricity demand.

Four Risks of Over-Development

1. Unrestrained data center proliferation jeopardizes PNW's clean energy transition.

- The projected energy consumption from data center development will nearly triple by 2029, outpacing planned growth of renewable generation. [8]
- In order to serve the rampant growth of new data centers in eastern Washington and Oregon, PNW utilities like Grant Public Utility District and Umatilla Electric Cooperative have increasingly sourced dirty "unspecified" power derived from fossil fuels.
- Utilities may delay retirements of gas-fired power plants and continue expanding gas infrastructure through projects like the GTN Xpress Pipeline expansion, Mist Natural Gas Storage expansion, and the Williams' Kelso Beaver Reliability Project.

2. Data center expansion wastes resources on polluting nuclear power in the PNW and undermines Hanford Nuclear Site cleanup.

- Tech giants are pursuing plans to develop small modular nuclear reactors (SMNRs) along the Columbia River in Washington and Oregon to power their data centers.
- SMNRs are a false solution that diverts funding from proven renewable energy technologies that are safer, less expensive, and faster to deploy.
- SMNRs pollute and burden Tribal and rural communities, producing two to 30 times the radioactive waste of older nuclear designs, waste for which we have no national repository.

3. Data center overdevelopment threatens dam removal and salmon conservation efforts.

- Technologies for keeping data centers cool contain pollutants not normally targeted for removal by municipal wastewater treatment plants.[9]
- Though the Lower Snake Dams provide a small fraction of PNW energy supply, rising power demand from new data centers could squash dam removal efforts and threaten salmon recovery.
- Data centers require millions of gallons of water per day.[10] Doubling or tripling of data centers' water use—from groundwater to streams and rivers that feed municipal water supply—drains water supply in drought-prone areas and endangers fish and wildlife.

4. Unregulated data center expansion raises electricity costs for PNW families and businesses.

- Residential and commercial ratepayers are forced to fund discounted rates for data centers and are saddled with industry risks and costly infrastructure upgrades.
- If actual data center demand does not reach projected growth, utilities—and their ratepayers—could be stranded with expensive, unnecessary energy infrastructure.
- Higher electricity rates further burdens low-income communities in the Northwest, contributing to a growing affordability crisis across the region.

Policy Strategies for Data Center Reform

Here's what others are doing around the country:

Transparency

Data center development has gone largely unchecked in the PNW, making Oregon the second largest market in the US, behind Virginia. Yet the full economic and environmental impact of data centers in the PNW is unknown. Annual reporting on energy and water use and job creation is necessary for responsible, sustainable, and equitable development.

- Tech companies like **Google and Amazon** have consistently squashed efforts by journalists and state lawmakers to make public their data center water and energy usage.

- **Failed legislation** in California (SB 58, 2025) and Oregon (HB 2816, 2023) sought to hold data centers to sustainability and GHG reduction goals, as well as jobs requirements.

- Lawmakers in Illinois were unsuccessful in attempts to **require data centers to report annual water and energy consumption** (SB 2181, 2025).

- In 2025, lawmakers in New York (S6394, 2025) and New Jersey (S4143, 2025) are pursuing legislation that would **establish data center energy reporting standards,** to measure both efficiency and sustainability.

Policy Strategies, continued...

Accountability

Unregulated data center expansion will raise electricity costs for PNW families and businesses as other ratepayers are forced to fund discounted rates for data centers and are saddled with industry risks and costly infrastructure upgrades.

- In 2025, Oregon enacted the POWER Act, which requires investor-owned utilities (IOUs) to create a new customer category for data centers, among other protections that shield ratepayers from costs and risks of data center-related infrastructure. But the **new rules do not apply to consumer-owned utility districts which serve 37 percent of the load in Oregon.**

- Utilities across the country are enacting new rules to **shield ratepayers from the cost of infrastructure upgrades**, including:
  - Minimum contract requirements;
  - Penalties for energy under-or overuse misaligned with forecasts; and
  - Requirements for data centers to pay for upstream generation, transmission and distribution costs

Policy Strategies, continued...

Oversight

Data center development has gone largely unchecked in the PNW, with closed-door negotiations between elected officials and tech companies and **virtually zero public input.**

State oversight, in addition to local review, is needed to evaluate the industry's impacts on neighboring communities as well as state land use and climate priorities.

- Virginia lawmakers passed legislation in 2025 (HB 1601) requiring data center applicants to **submit a site assessment** before rezoning or special use permits could be approved, however, Governor Youngkin vetoed the measure.

- Minnesota enacted new rules in 2025 that require data centers to **consider water conservation measures** and utilities to submit a plan on how they will serve data centers while complying with state decarbonization goals.

- In absence of state oversight, some county officials across the country have **changed local zoning laws** to protect neighboring communities from noise and pollution impacts.

Read our list of legislative attempts to regulate data centers from around the country.

Join us to protect the Columbia River and river communities from the dangers of data center proliferation.

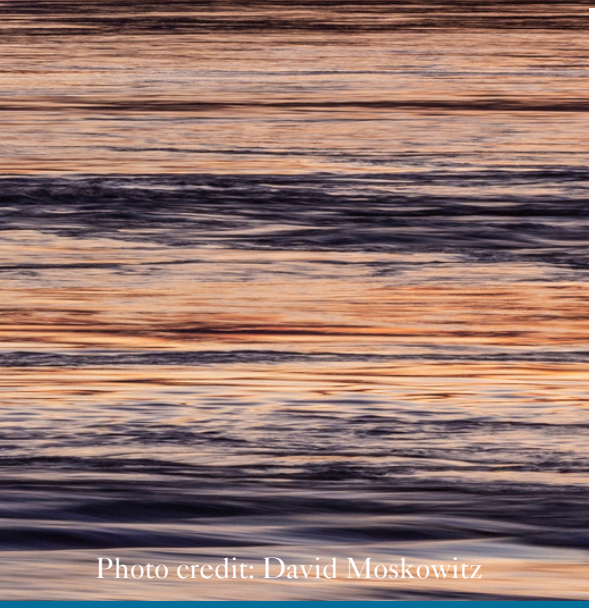


Photo credit: David Moskowitz

COLUMBIA RIVERKEEPER®

Sign Up to Stay Informed

This background brief was produced in collaboration with Salish Strategies: Eric de Place, Julia Stone, and Zane Gustafson.

References

1. Arman Shehabi et al., 2024 United States Data Center Energy Usage Report, Lawrence Berkeley National Laboratory (Dec. 2024), https://escholarship.org/uc/item/32d6m0d1
2. Assuming 10.8 Mwh electricity per household. See U.S. Energy Administration, Frequently Asked Questions (last updated Jan. 8, 2024), https://www.eia.gov/tools/faqs/faq.php?id=97&t=3. In 2023, Portland had 292,037 households. See U.S. Census Bureau, Portland city, Oregon, https://data.census.gov/profile?q=Portland%20oregon&g=160XX00US4134100,4131250,4105350 (last visited July 23, 2025).
3. Includes Washington, Oregon, Idaho, and Montana. Estimates calculated through analysis of data from Lawrence Berkeley National Lab (see Shehabi et al. (2024), at note 1), the Electric Power Research Institute, and the Northwest Power and Conservation Council (see note 8).
4. Calculations based on Water Use Efficiency figures from Shehabi et al. (2024), at note 1, https://escholarship.org/uc/item/32d6m0d1.
5. Assuming 107 gallons per household per day, or 39,055 gallons per year. See Water Use Data for Washington, U.S. Geological Survey (page last modified July 23, 2025), https://waterdata.usgs.gov/wa/nwis/water_use.
6. Rasheed Ahmad, Engineers often need a lot of water to keep data centers cool, American Society of Civil Engineers (Mar. 4, 2024), https://www.asce.org/publications-and-news/civil-engineering-source/civil-engineering-magazine/issues/magazine-issue/article/2024/03/engineers-often-need-a-lot-of-water-to-keep-data-centers-cool.
7. Wesley Spindler et al., Why circular water solutions are key to sustainable data centres, World Economic Forum (Nov. 7, 2024), https://www.weforum.org/stories/2024/11/circular-water-solutions-sustainable-data-centres/.
8. Analysis based on data from the Pacific Northwest Utilities Conference Committee and the Northwest Power and Conservation Council. See Northwest Regional Forecast of Power Loads and Resources for August 2024 through July 2034, Pacific Northwest Utilities Conference Committee (May 2024), https://www.pnucc.org/wp-content/uploads/2024-PNUCC-Northwest-Regional-Forecast-final.pdf; see also Pacific Northwest Power Supply Adequacy Assessment for 2029, Northwest Power and Conservation Council (Aug. 9, 2024), https://www.nwcouncil.org/reports/2024-4/.
9. Projection based on analysis of data from Electric Power Research Institute, the Northwest Power and Conservation Council (see note 8), and the Lawrence Berkeley National Laboratory (see Shehabi et al. [2024], at note 1).
10. Ahmad (2024), at note 6, https://www.asce.org/publications-and-news/civil-engineering-source/civil-engineering-magazine/issues/magazine-issue/article/2024/03/engineers-often-need-a-lot-of-water-to-keep-data-centers-cool.
11. Shehabi et al. (2024), at note 1, https://escholarship.org/uc/item/32d6m0d1.
12. According to Cushman & Wakefield's 2024 Global Data Center Market Comparison guide, Oregon ranks second to Virginia in US data center markets by operational IT load (MW). See Global Data Center Market Comparison, Cushman & Wakefield (2024), https://cushwake.cld.bz/2024-Global-Data-Center-Market-Comparison/15/.
13. In Washington, 61% of the load is served by consumer-owned utility districts. See Jeanne Currie, Demystifying the Northwest Utility Landscape, Clean Energy Transition Institute (Jan. 29, 2025), https://www.cleanenergytransition.org/post/demystifying-the-northwest-utility-landscape.