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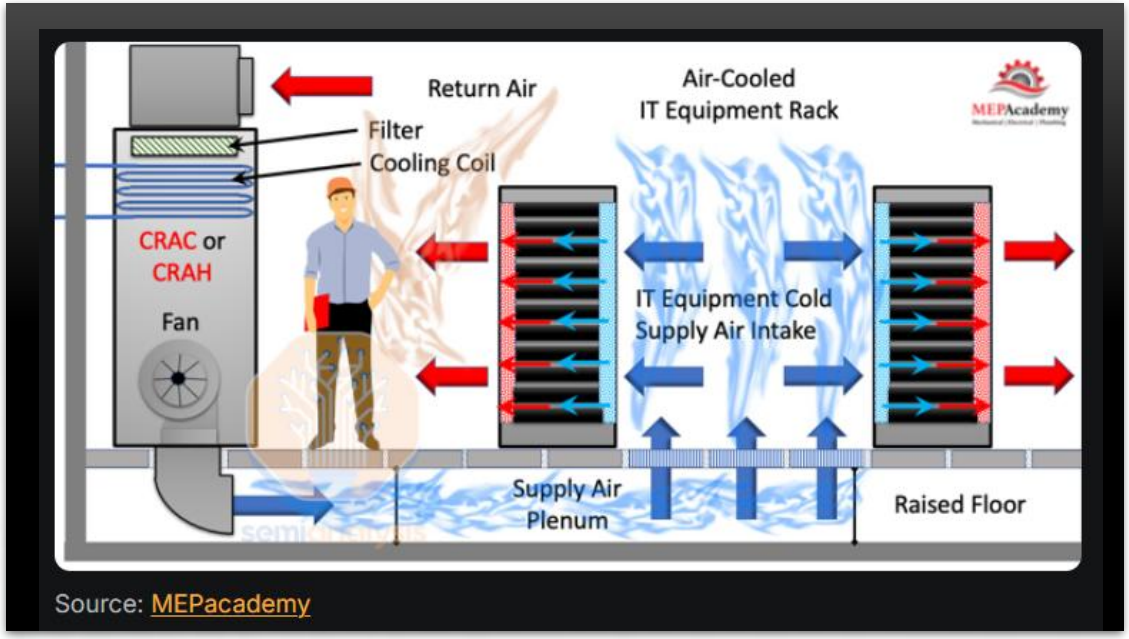
Data Centers and Water Use

NASUCA, June 2025

Data Centers Use Water for Thermal Management

Water is used to cool hot air produced by data servers.



Approximately 80% of the water will be evaporated as steam.

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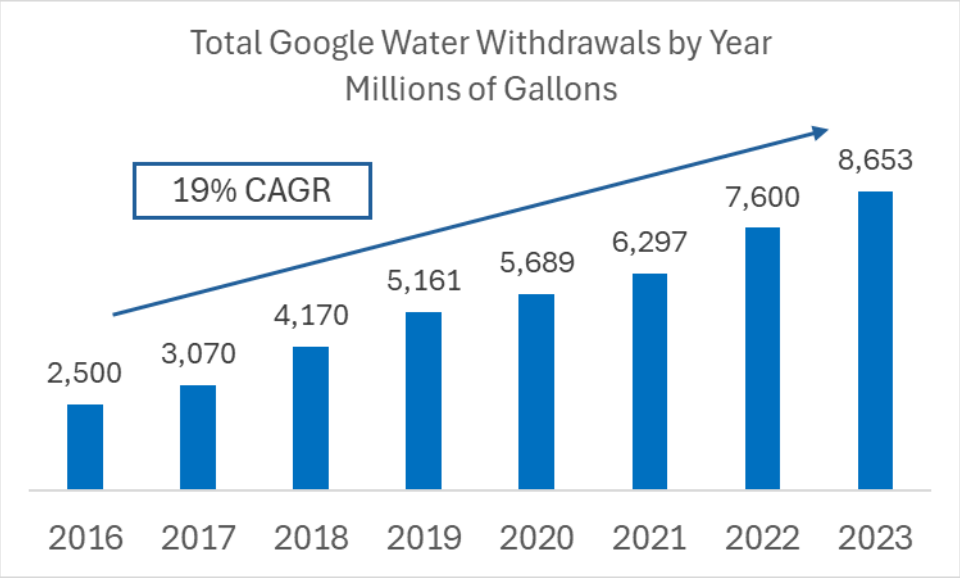
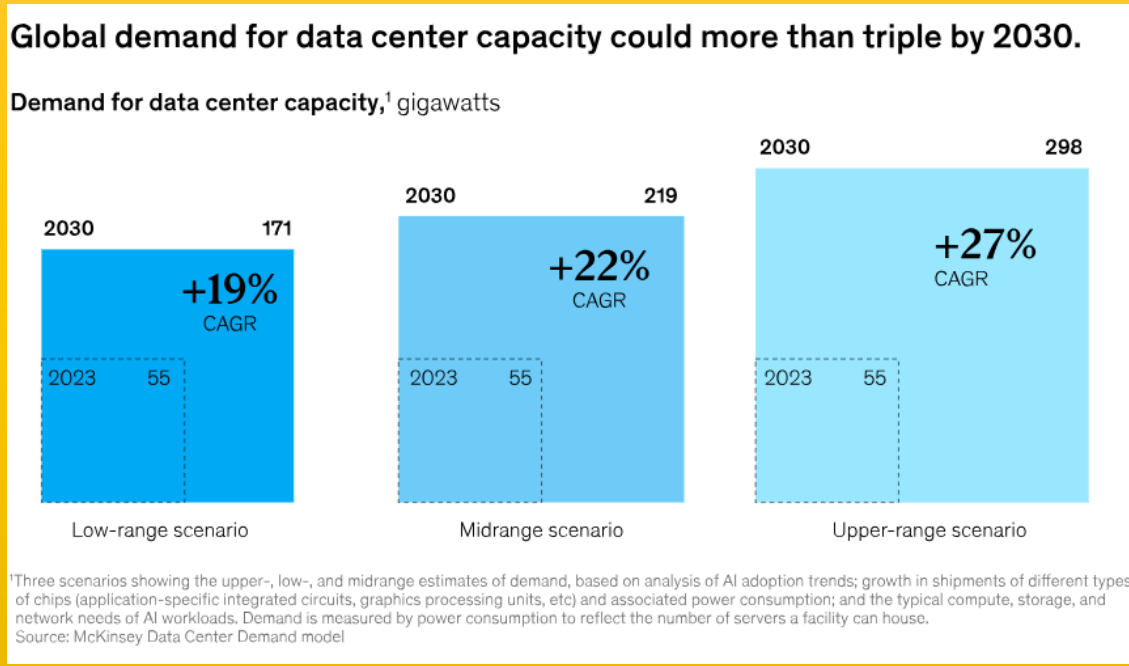
Image on left: https://semianalysis.com/2025/02/13/datacenter-anatomy-part-2-cooling-systems/
Image on right: https://datacenters.google/locations/council-bluffs-iowa/
Google Council Bluffs data from Google 2024 Environmental Report: https://www.gstatic.com/gumdrop/sustainability/google-2024-environmental-report.pdf

Data Center Capacity Demands are Expected to Grow Rapidly

Google water consumption has more than tripled since 2016. In 2022 & 2023, 87%-89% of water withdrawals were for data centers[1]



In 2024, McKinsey forecasted 19-27% global growth per year[2]



2-https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/ai-power-expanding-data-center-capacity-to-meet-growing-demand

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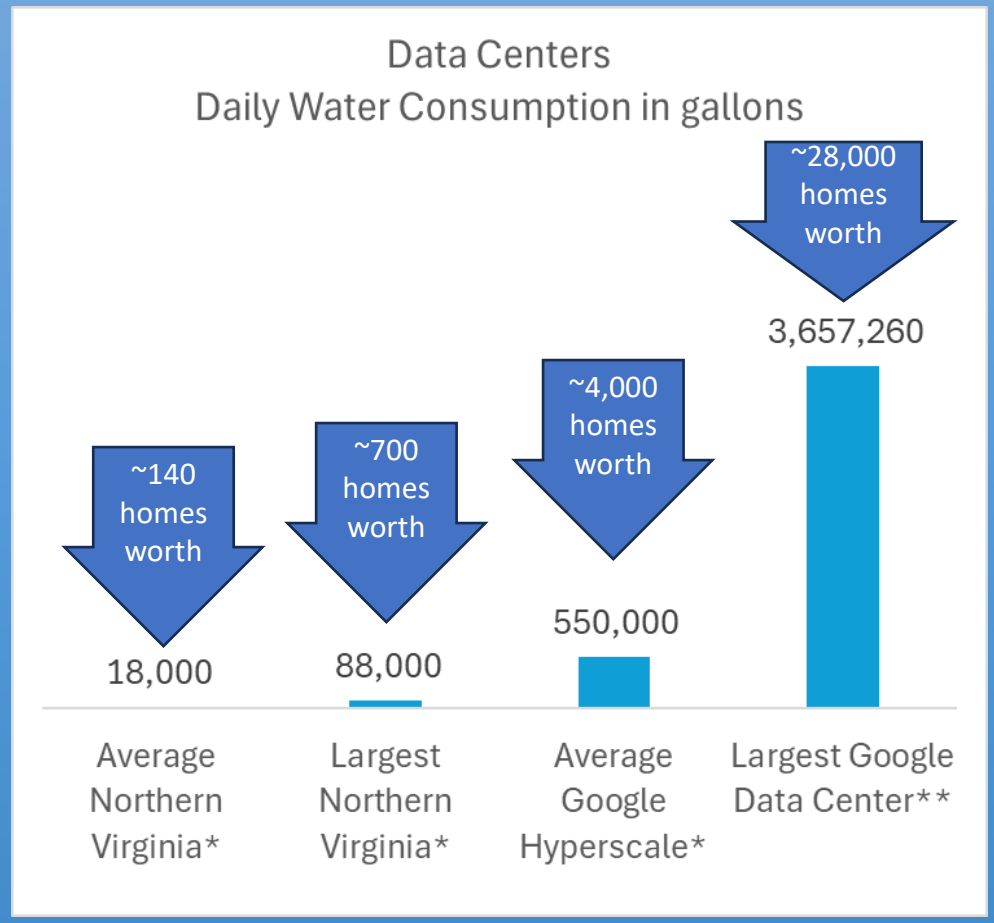
1- Chart data compiled from reported water withdrawals, water consumption, and water use by data center in Google's 2024, 2023, and 2019 Environmental Reports: https://www.gstatic.com/gumdrop/sustainability/google-2024-environmental-report.pdf; https://www.gstatic.com/gumdrop/sustainability/google-2023-environmental-report.pdf; https://www.gstatic.com/gumdrop/sustainability/google-2019-environmental-report.pdf

One Size Doesn't Fit All in Terms of Water Demands



In 2024, Google's Council Bluffs, Iowa data center consumed 1.3 billion gallons of potable water (~3.7 million gallons per day). This is similar to the amount used by a large university.

Notes:
Home equivalencies estimated presuming 4,000 gallons of water per month per home
*Zhang, Mary; January 17, 2024; *Data Center Water Usage: A Comprehensive Guide*, Dgtl Infra. https://dgtlinfra.com/data-center-water-usage/
**Google 2024 Environmental Report, https://www.gstatic.com/gumdrop/sustainability/google-2024-environmental-report.pdf

Potable Water Most Commonly Utilized for Data Center Needs

- Potable water provided by utilities/3rd party is primarily used for cooling data centers
  - Benefits include water quality and reliability (prevents corrosion; ensures proper equipment function and extends equipment useful life)

- Non-potable water used on occasion
  - 22% of Google's 2023 withdrawals were non-potable.[1]
  - Microsoft built reuse facilities to reduce their potable water use in Quincy, Washington by 97%[2]

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1- Google 2024 Environmental Report, page 45Image on right: Microsoft 2024 Environmental Sustainability Report p. 44. https://www.gstatic.com/gumdrop/sustainability/google-2024-environmental-report.pdf
2- Microsoft 2025 Environmental Sustainability Report, page 36, https://cdn-dynmedia-1.microsoft.com/is/content/microsoftcorp/microsoft/msc/documents/presentations/CSR/2025-Microsoft-Environmental-Sustainability-Report-PDF.pdf#page=01
3- Image : https://www.microsoft.com/en-us/corporate-responsibility/sustainability/report

What Happens to Water Discharge?

Life cycle of water used for data centers depends on system design and regulatory requirements

- Recirculation and reuse – water is cooled after absorbing heat from data center then reused;
- Discharge – system may call for used water to be discharged as wastewater into wastewater treatment facility or body of water or,
- Evaporative cooling – evaporated water is consumed while cooling remaining water; may result in water loss

Data centers typically evaporate about 80% of the water they draw. The remainder would be discharged for wastewater treatment*

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*Leonardo Nicoletti, Michelle Ma, Dina Bass, *How AI Demand is Draining Local Water Supplies,* May 8, 2025, Bloomberg, https://www.bloomberg.com/graphics/2025-ai-impacts-data-centers-water-data/ ("*AI Demand is Draining Local Water Supplies*").
Image on right: Meta 2024 Sustainability Report p.40 https://sustainability.atmeta.com/2024-sustainability-report/

How This Could Impact Regulated Water Utilities

Some Communities May Add Data Centers as Commercial or Industrial Customers

Some Communities May Experience Increased Water and Wastewater Treatment Demands and Associated Capital Needs

Water Strained Communities May Have Challenges. Communities with Surplus Capacity May Benefit from Organic Growth

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Thank you!