



A DCYB Study • September 2026

The Case for Compute

Why the Next Generation of AI Infrastructure Serves Humanity, and
Why the Public Debate Runs on the Wrong Numbers



Evidence drawn from the official record of the United States Government.
Independent research by Data Center Youngbloods. Not a government publication.

The Next Generation of Digital Infrastructure.

Luke Adams, Founder and CEO
Data Center Youngbloods

95 Cited Sources • Built on Federal Laboratory Data, Peer Reviewed Trials, and Public Records

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A DCYB Study by Luke Adams, Founder and CEO, Data Center Youngbloods. September 2026.

01	Executive Summary	3
02	The Debate Runs on the Wrong Numbers	4
03	What the Compute Already Does for Medicine	5
04	The Water Question	7
05	The Energy Question	10
06	The Economic Case	13
07	The Backbone of Daily Life	15
08	Governments Treat Compute as Strategic	15
09	What the Debate Should Be About	16
10	The Workforce Is the Constraint	16
11	Conclusion	17
12	Sources	18

This study assembles primary evidence across four domains, health, water, energy, and economics, and states plainly where the case for AI infrastructure is strong and where legitimate concerns remain. Every figure is drawn from federal laboratory reports, peer reviewed journals, government budget records, and international agency projections, and every source is listed with its full address in the final section.

Built on Federal Data and Public Records

The quantitative claims in this study rest on the official record of the United States Government and its national laboratories, on peer reviewed clinical trials indexed by the National Institutes of Health, and on adopted local budgets. Where an international figure is used, it comes from the International Energy Agency, an intergovernmental body whose members include the United States. The agencies and records below carry the study's core numbers on water, energy, health, and economic impact.

U.S. Department of Energy

Lawrence Berkeley National Laboratory

2024 United States Data Center Energy Usage Report, prepared for Congress under the Energy Independence and Security Act. The authoritative federal estimate of data center electricity and direct water use, and the Science 2020 study of global data center energy from 2010 to 2018.

Sources 3, 7, 19

U.S. Department of Health and Human Services

National Institutes of Health, National Library of Medicine

PubMed and PubMed Central indexed randomized trials and peer reviewed studies, including the MASAI breast screening trial and the rentosertib Phase IIa results that anchor the health chapter.

Sources 26, 31, 79, 86

Executive Office of the President

The White House

America's AI Action Plan and the July 2025 Executive Order accelerating federal permitting of data center infrastructure, cited for the federal policy position on AI infrastructure.

Sources 89, 90

U.S. Department of the Interior

U.S. Geological Survey

Circular 1441, Estimated Use of Water in the United States. The national baseline for thermoelectric cooling, irrigation, and public supply withdrawals against which data center water use is measured.

Sources 36

U.S. Department of Health and Human Services

Centers for Medicare and Medicaid Services

Federal utilization data on the expansion of Medicare telehealth, used to size the digital delivery of care that runs on the same infrastructure.

Sources 83

Loudoun County, Virginia

County Government and Board of Supervisors

Adopted budget records, Tax Revenues and County Budget disclosures, and the FY2027 to FY2030 Fiscal Strategy, the primary record for data center tax contribution in the largest data center market in the world.

Sources 11, 71

Independence

Data Center Youngbloods is a private company. This study is independent research by Luke Adams, Founder and CEO. It is not sponsored, endorsed, reviewed, or approved by any agency of the United States Government, and no federal agency bears responsibility for the analysis or conclusions. Agency names identify the origin of public data only.

Executive Summary

The data centers now rising across the United States are the physical substrate of the most consequential scientific instrument humanity has ever built. The same compute that answers a chat prompt has already mapped the structure of nearly every protein known to science, discovered new antibiotics from libraries of one hundred million molecules, caught breast cancers that two radiologists missed, and moved a drug designed end to end by AI into a Phase III trial for a lethal lung disease. The next generation of this infrastructure will extend those results into every disease, every grid, every flood plain, and every classroom.

The public debate about that infrastructure has detached from the evidence. Three in four Americans now say they would oppose a data center near their home¹, and the two most cited reasons are water and energy². Yet every data center in the United States combined draws about 17.4 billion gallons of water a year on site³, while the nation's golf courses irrigate with about 532 billion gallons⁴. Data centers consumed about 1.5 percent of global electricity in 2024⁵, a share smaller than the electricity the world spends on air conditioning by an order of magnitude.

This study assembles the primary evidence across four domains, health, water, energy, and economics, and states plainly where the case is strong and where legitimate concerns remain. The conclusion is definitive. The benefits of the AI buildout are real, measurable, and compounding. The costs are real, local, and solvable. The people who will solve them are the engineers, technicians, and operators who do not yet exist in sufficient numbers, and that workforce is the constraint that decides whether the next generation of digital infrastructure arrives responsibly or arrives late.

Question	The Common Claim	The Evidence
Water	Data centers drain local supplies	All US data centers use 17.4 billion gallons a year directly. US golf courses use 532 billion. Alfalfa on the Colorado River alone uses about 94 times the data center total ^{3, 4, 6}
Energy	AI will consume the grid	Data centers used 1.5 percent of global electricity in 2024 and will reach about 3 percent by 2030. Compute grew 550 percent from 2010 to 2018 while data center energy grew 6 percent ^{5, 7}
Climate	AI accelerates warming	Data centers emit 180 Mt CO2 a year. AI enabled efficiencies could cut 1,400 Mt a year by 2035, a figure three to four times data center emissions ⁸
Health	AI medicine is hype	A randomized trial of 105,934 women found AI supported screening detected 29 percent more cancers with 44 percent less radiologist workload. An AI designed drug gained 98.4 mL of lung function versus a 20.3 mL loss on placebo ^{9, 10}
Economy	Data centers bring few jobs	Data centers pay 42 percent of Loudoun County's local taxes and cut its property tax rate by 30 percent. US data center construction reached a \$75.2 billion annual pace in July 2026 ^{11, 12}

The Debate Runs on the Wrong Numbers

Opposition Has Doubled in a Year

Public sentiment toward data centers inverted between 2025 and 2026. In August 2025, Heatmap's national survey found 44 percent of Americans would support a nearby data center and 42 percent would oppose one¹³. Twelve months later the same pollster found 75 percent opposed and 61 percent strongly opposed, a 33 point swing¹. Gallup asked the question for the first time in March 2026 and recorded 71 percent opposition, higher than the 53 percent who oppose a local nuclear plant, a level nuclear opposition never reached in 25 years of Gallup tracking². Change Research tracked local support collapsing from 51 percent in favor and 26 percent opposed in March 2025 to 25 percent in favor and 65 percent opposed in April 2026¹⁴.

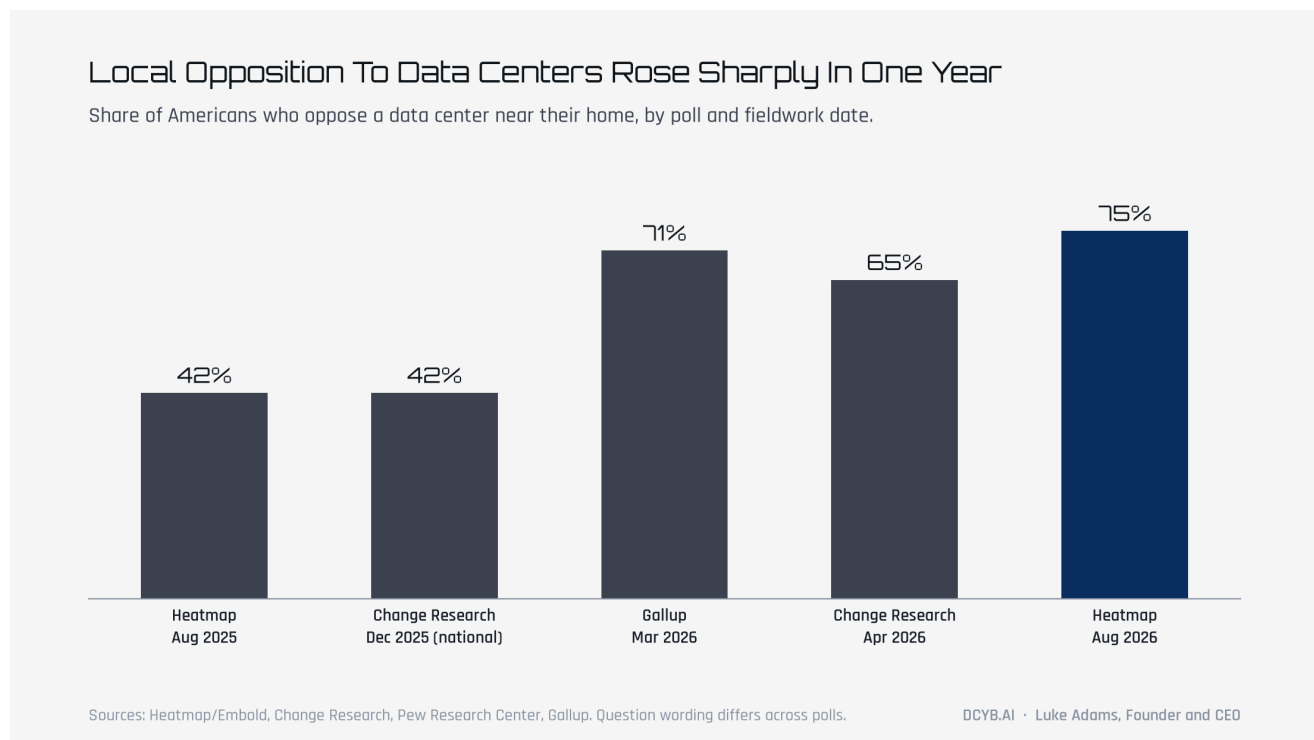


Figure 1. Local opposition to data centers rose sharply in one year

The opposition now has financial weight. Data Center Watch counted \$64 billion of projects blocked or delayed between May 2024 and March 2025¹⁵. In the first quarter of 2026 alone, at least 75 projects worth about \$130 billion were blocked or delayed, and active opposition groups more than doubled from 396 to 833 across 49 states^{16, 17}. Moratorium bills appeared in 14 statehouses plus Congress¹⁷.

What Opponents Actually Cite

Gallup's breakdown of opponents shows that half cite resource use, split evenly between water at 18 percent and energy at 18 percent, followed by pollution and noise at 16 percent, quality of life at about one in five, and economic harm such as utility bills at a similar share². Pew finds Americans believe data centers are bad for the environment by 39 percent to 4 percent and bad for home energy costs by 38 percent to 6 percent, with at least one in five unsure in every category¹⁸.

Those two headline concerns, water and energy, are exactly where the public numbers diverge most sharply from the measured ones. The remainder of this study addresses each in turn.

The Industry Has Been Wrongly Forecast Before

This is not the first time the electricity appetite of computing has been declared a crisis. In 1999, a widely circulated Forbes analysis claimed the internet already consumed 8 percent of US electricity and would reach half of all US power within a decade. Lawrence Berkeley National Laboratory's rebuttal put the true figure at 2 to 3 percent, and its scientists published the correction under the title "Sorry, Wrong Number"¹⁹. A 2015 academic projection put data centers at about 3,000 TWh by 2030 in its expected case, more than 10 percent of global electricity. The actual 2024 figure was 415 TWh, and the IEA's 2030 projection is 945 TWh⁵. The pattern is consistent. Forecasts extrapolate demand growth and ignore the efficiency curve that has accompanied every generation of computing.

03

What the Compute Already Does for Medicine

The strongest argument for the AI buildout is not a forecast. It is a body of peer reviewed clinical and scientific results that already exist, produced by models trained and served in exactly the facilities now facing moratoriums.

Protein Structure Solved

AlphaFold predicted the structures of more than 200 million proteins, essentially every protein known to science, and made them freely available to more than three million researchers in over 190 countries²⁰. Before AlphaFold, determining a single protein structure experimentally took months or years. The Royal Swedish Academy of Sciences awarded the 2024 Nobel Prize in Chemistry to Demis Hassabis and John Jumper for the achievement²¹. Five years after release, the database has reshaped structural biology, vaccine design, and enzyme engineering across thousands of published studies²².

The successor system, AlphaFold 3, extends prediction to the interactions between proteins, DNA, RNA, small molecules, and antibodies, the interactions that define how drugs bind to their targets²³. AlphaMissense, a related model, classified 71 million possible human genetic variants as likely benign or likely disease causing, classifying 32 percent as likely pathogenic and 57 percent as likely benign, and raising the share of confidently classified clinical variants from 67 to 93 percent²⁴.

Drugs Designed by Machines Now Reach Late Stage Trials

Rentosertib is the first drug for which both the biological target and the molecule were discovered by generative AI. Insilico Medicine's Phase IIa trial in 71 patients with idiopathic pulmonary fibrosis, a disease that typically kills within three to five years of diagnosis, found that patients on 60 mg daily gained 98.4 mL of forced vital capacity over 12 weeks while placebo patients lost 20.3 mL¹⁰. Lung function in IPF patients declines relentlessly under every existing therapy. A drug that reverses the decline is unprecedented. Insilico dosed the first patient in a 320 patient Phase III trial on July 7, 2026²⁵.

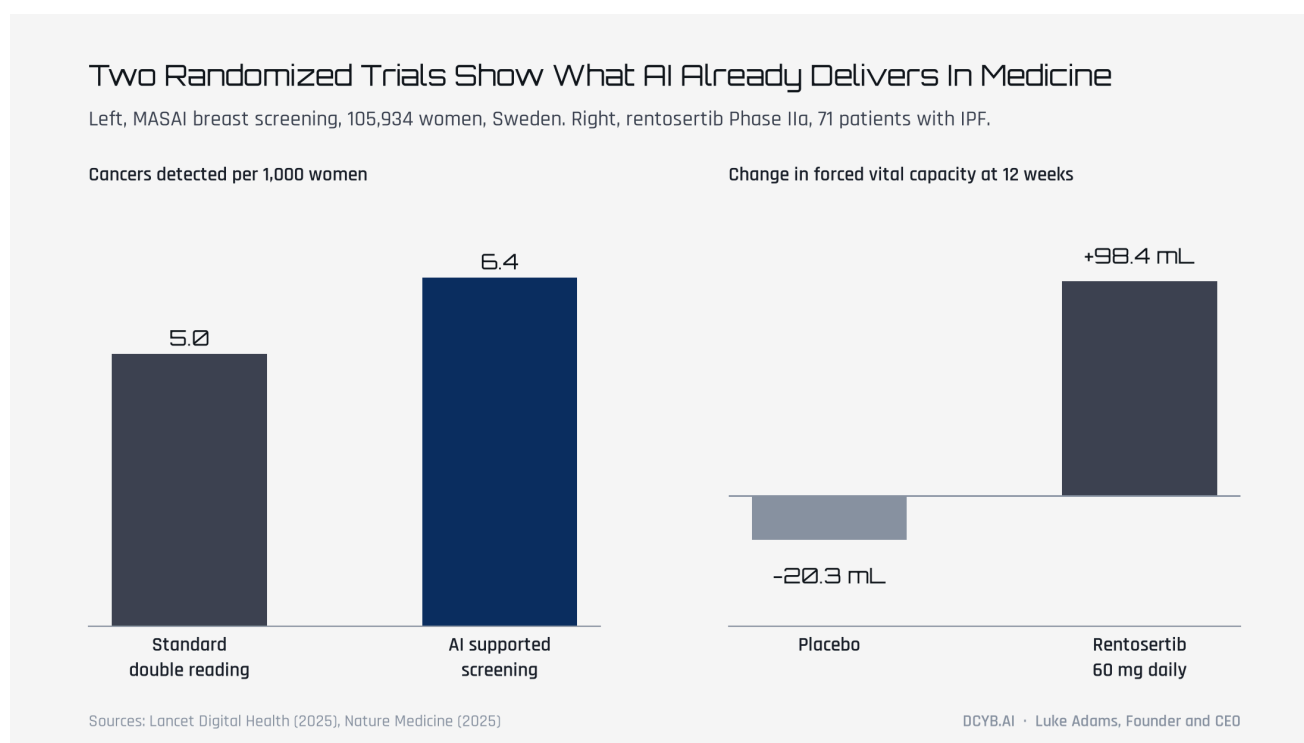


Figure 2. Two randomized trials show what AI already delivers in medicine

The economics of drug discovery are changing with the technology. A Boston Consulting Group analysis of AI discovered molecules found Phase I success rates of 80 to 90 percent, compared with a historical industry average near 40 to 65 percent, because AI designed candidates arrive with stronger safety and druglike properties²⁶. Pharmaceutical majors have priced that advantage. Eli Lilly signed a collaboration with Insilico worth up to \$2.75 billion in March 2026.

New Antibiotics Against Resistant Bacteria

Antibiotic resistance is one of the leading infectious killers worldwide and pharmaceutical pipelines had nearly stopped producing new classes. In 2020, an MIT team trained a deep learning model on molecular structures and screened more than 107 million compounds in silico, surfacing halicin, a structurally novel antibiotic that killed *Acinetobacter baumannii* and *Clostridioides difficile* in mice²⁷. In 2025 the same group used generative models to design two entirely new compounds, NG1 and DN1, that killed drug resistant gonorrhea and MRSA in animal models by mechanisms unlike any antibiotic in clinical use²⁸. The scale of these searches, hundreds of millions of candidates evaluated in days, is not possible without hyperscale compute.

Repurposing Existing Medicine for Rare Diseases

Harvard's TxGNN model, trained on medical knowledge graphs, predicts which approved drugs could treat any of 17,080 diseases, most of which have no approved treatment at all²⁹. The approach has already saved a life in the clinic. Joseph Coates, a patient with POEMS syndrome whose physicians had exhausted standard options, recovered after a researcher used an AI model to identify an unconventional combination of existing drugs³⁰. Most of the thousands of known rare diseases have no approved therapy and no commercial incentive to develop one. Repurposing at machine scale is the only credible path to treating most of them.

Diagnosis and Emergency Care

The MASAI trial in Sweden randomized 105,934 women to either standard double reading by two radiologists or AI supported screening. AI supported screening detected 6.4 cancers per 1,000 women versus 5.0 for standard care, a 29 percent increase in detection, while reducing radiologist screen reading workload by 44 percent⁹. Follow up analysis found the AI arm reduced interval cancers, the cancers that appear between screenings because the first screen missed them, with sensitivity rising from 73.8 to 80.5 percent³¹. Fewer missed cancers and fewer radiologist hours in a specialty with a global shortage is the definition of a system that helps people.

In sepsis, where every hour of delayed treatment raises mortality, the TREWS early warning system deployed across five hospitals and 590,736 patient encounters reduced mortality by 18.7 percent in relative terms when clinicians acted on its alerts within three hours³². Viz.ai's stroke detection software now runs in more than 2,000 hospitals, shortening the time between a scan and a neurosurgeon's decision.

AI as a Scientific Collaborator

Google's AI co-scientist system, built on Gemini, generated a novel hypothesis about how a class of bacterial genetic elements spreads between species, matching an unpublished experimental finding that took human researchers a decade to reach³³. OpenAI and Retro Biosciences trained GPT-4b micro to redesign the Yamanaka factors used in cellular reprogramming, producing variants with a 50 fold increase in reprogramming efficiency in laboratory tests³⁴. The University of Washington's RFantibody system designs antibodies from scratch to a chosen target, a capability that compresses a process that once took years of animal immunization into a computational step³⁵.

Where the Health Evidence Stops

Credibility requires precision about limits. No drug discovered by AI has yet received FDA approval as of August 2026. Rentosertib remains in Phase III. Isomorphic Labs, DeepMind's drug discovery spinout, has raised \$2.1 billion and had not dosed a patient as of May 2026. Many diagnostic AI results come from single health systems and require replication. The right claim is not that AI has cured disease. The right claim is that AI has produced randomized, peer reviewed improvements in cancer detection, sepsis survival, and lung function, has discovered new antibiotics that work in animals, has solved the protein structure problem, and now sits in late stage trials with a pipeline no prior technology matched. That claim is strong enough on its own.

04

The Water Question

Golf Courses Against Data Centers

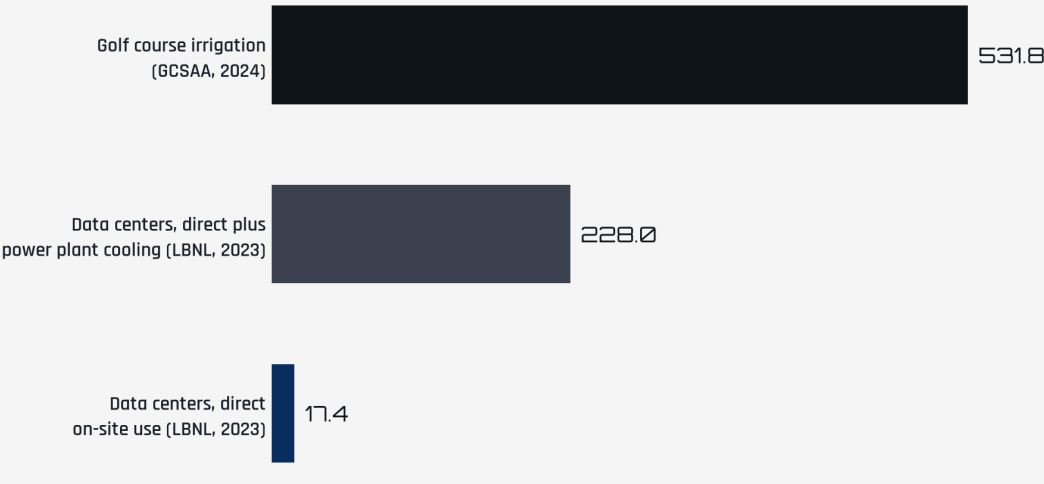
Water is the objection most often raised against data centers and the one least supported by national data.

Lawrence Berkeley National Laboratory's 2024 report to Congress, the authoritative federal estimate, puts direct on site water consumption by all US data centers at about 66 billion liters in 2023, or 17.4 billion gallons³. The Golf Course Superintendents Association of America's 2024 national survey puts golf course irrigation at 1,631,915 acre feet a year, which converts to 531.8 billion gallons, or 1.46 billion gallons every day⁴.

American golf courses use 30 times more water than every American data center combined.

US Golf Courses Use Thirty Times The Water Of US Data Centers

Billion gallons per year. Golf 2024 survey, data centers 2023 estimate.



Sources: GCSAA Golf Course Environmental Profile Phase 4 (2025), Lawrence Berkeley National Laboratory (2024) DCYB.AI · Luke Adams, Founder and CEO

Figure 3. US golf courses use thirty times the water of US data centers

Honesty demands the fuller accounting. Data centers also consume water indirectly, through the cooling towers of the power plants that supply their electricity. LBNL estimates that indirect draw at roughly 800 billion liters, about 211 billion gallons³. Even with indirect use included, the industry's total of roughly 228 billion gallons is 43 percent of what golf courses irrigate with. And the indirect figure is a property of the electricity system, not of data centers. Every kilowatt hour drawn from a thermoelectric grid carries the same water burden whether it runs a server, a steel mill, or a suburb, and it falls as the grid shifts to solar, wind, and dry cooled generation.

Water Use	Billion Gallons Per Year	Multiple of Data Center Direct Use	Source
US thermoelectric power cooling	48,545	2,790 x	USGS ³⁶
US irrigation	43,070	2,475 x	USGS ³⁶
US public supply	14,235	818 x	USGS ³⁶
Colorado River alfalfa and forage	1,630	94 x	Colorado Sun ⁶
US golf course irrigation	532	31 x	GCSAA ⁴
US data centers, direct plus indirect	228	13 x	LBNL ³
US data centers, direct on site	17.4	1 x	LBNL ³

USGS figures are 2015 daily withdrawals converted to annual totals. The United States withdrew about 322 billion gallons of water per day in 2015, with thermoelectric power at 133 billion, irrigation at 118 billion, and public supply at 39 billion gallons per day³⁶. Data center direct consumption is about 0.015 percent of US withdrawals. The Information Technology and Innovation Foundation independently estimates data centers at under 1 percent of US water consumption³⁷. The Electric Power Research Institute frames the 17.4 billion gallon figure as equal to the household water use of about 580,000 Americans, a mid sized city, spread across the whole country.

The Water in a Prompt

Public discourse fixates on the water cost of a single AI query. Google's measured figure for a median Gemini text prompt is 0.26 milliliters, about five drops³⁸. OpenAI's Sam Altman reports 0.32 milliliters per ChatGPT query³⁹. The widely quoted counterpoint from University of California Riverside researchers estimated 500 milliliters per 10 to 50 responses, or 10 to 50 milliliters per response, using older hardware and including indirect power plant water⁴⁰. At the measured figure, a person sending 100 prompts a day for a full year consumes about 9.5 liters of water, less than a single ten minute shower. At the highest published estimate, the same year of heavy use equals roughly two dozen showers.

Efficiency Is Falling Fast

The industry is engineering water out of the system. Water usage effectiveness, the liters consumed per kilowatt hour of IT energy, has fallen from an LBNL industry estimate of about 1.8 in 2016 to about 0.36 in 2023, and the largest operators are far below that^{41, 3}.

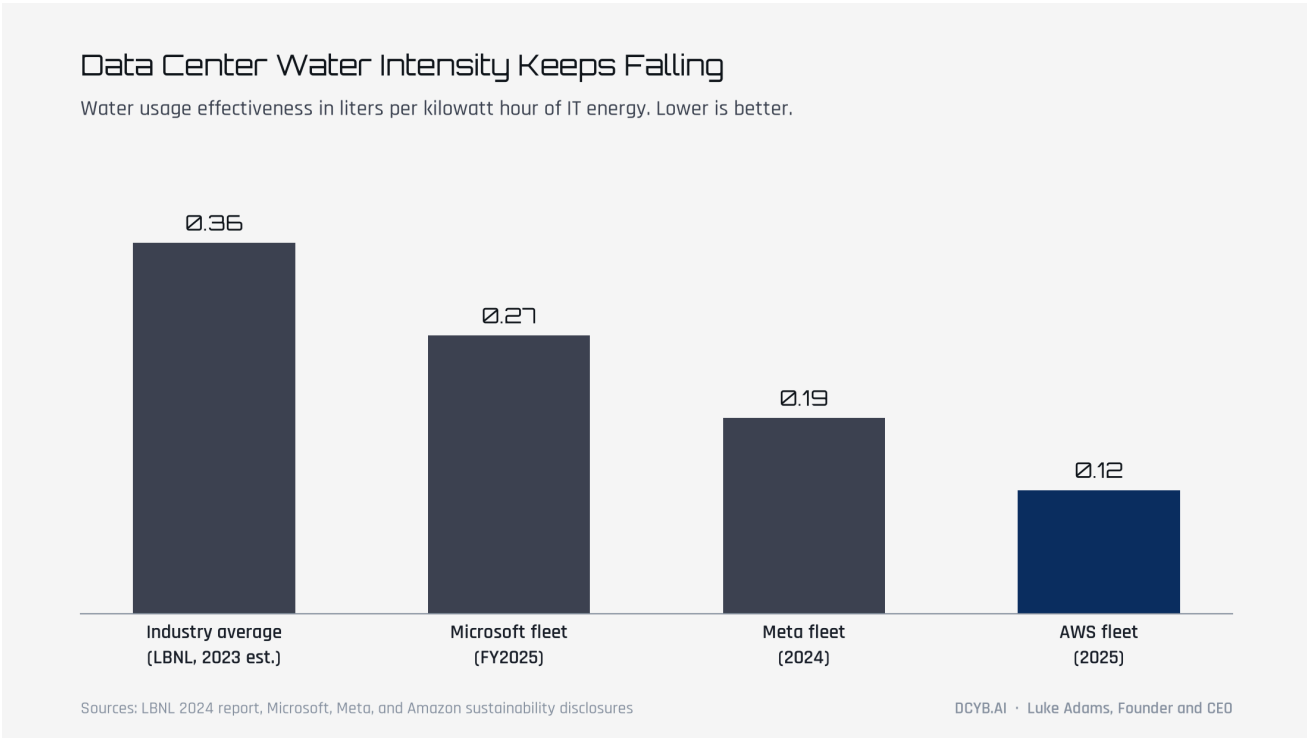


Figure 4. Data center water intensity keeps falling

Microsoft's newest designs use zero water for cooling, recirculating a closed loop indefinitely and eliminating evaporative loss, and its fleet WUE fell from 2.3 in the early 2000s to 0.27 in 2025 while the company replenished more water than it withdrew⁴². Amazon reports a fleet WUE of 0.12 and total 2025 withdrawals of 2.5 billion gallons across its global footprint⁴³. Meta's Kuna, Idaho campus, which came online September 3, 2026, uses closed loop cooling that Meta says

needs 87 times less water than its prior design, holds about 200,000 gallons in total, and shipped with a water and wastewater system worth more than \$100 million gifted to the city⁴⁴. Google replenished 78 percent of the freshwater it consumed in 2025 through 165 watershed projects, against a stated goal of 120 percent by 2030.

Where the Critics Have a Point

National totals do not water a specific aquifer. Bloomberg's analysis found about two thirds of new US data centers built or planned since 2022 sit in areas of high water stress⁴⁵, and Tucson's City Council rejected the Project Blue campus unanimously in August 2025 after learning it would draw 1,910 acre feet a year at full build in a desert city⁴⁶. Four families in Newton County, Georgia sued Meta in September 2026 after wells near its campus ran dry or turbid, a claim Meta disputes with its own groundwater study. Heatmap's tracker found water cited in more than 40 percent of contested projects⁴⁷. Transparency compounds the problem. Only 17 percent of Texas data centers responded to a state water use survey, and Tucson's fight turned on non disclosure agreements that kept water and power figures from the public⁴⁸.

The correct position is therefore pro infrastructure and pro accountability. Data centers are not a national water problem. Siting an evaporatively cooled campus on a stressed aquifer without disclosure is a local one, and the industry solves it with closed loop cooling, reclaimed water, public metering, and replenishment commitments. Every one of those solutions already exists in production.

05

The Energy Question

The Real Share of Electricity

Data centers consumed about 415 TWh of electricity in 2024, roughly 1.5 percent of global consumption. The International Energy Agency projects that to reach about 945 TWh by 2030, slightly more than Japan uses today, or about 3 percent of global demand⁵. In the United States, where the buildout is concentrated, data centers used 176 TWh or 4.4 percent of electricity in 2023 and are projected to reach 6.7 to 12 percent by 2028³.

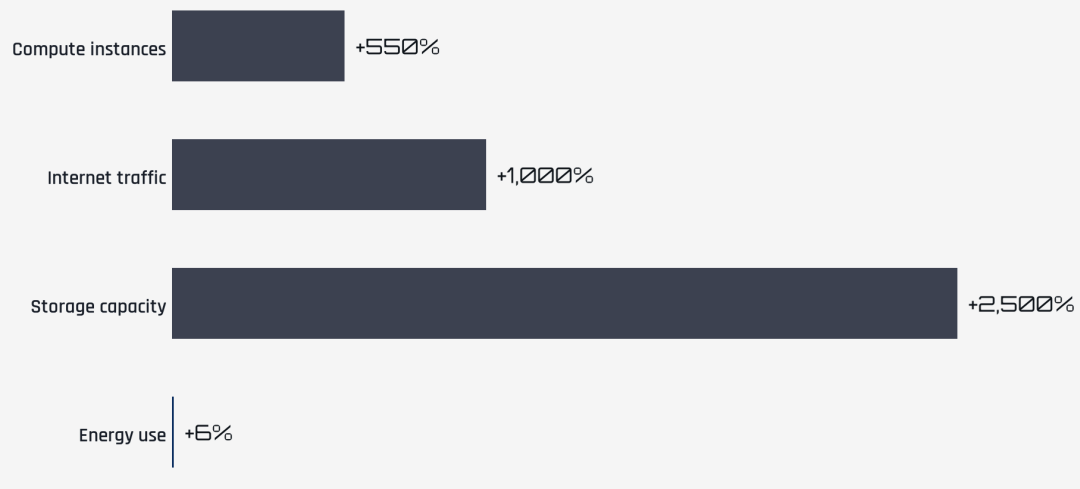
Those are significant numbers and they deserve serious grid planning. They are also smaller than the public imagines. Air conditioning alone consumes about 2,900 TWh a year globally, seven times all data centers, and 200 million new units shipped in 2024⁴⁹. Aviation produces about 2.5 percent of global CO2, five times the 0.5 percent attributed to data centers⁸.

Efficiency Has Always Outrun Demand

The single most important fact in the energy debate is the historical decoupling of compute from power. Between 2010 and 2018, global data center compute instances grew 550 percent, internet traffic grew tenfold, and storage capacity grew 25 fold. Data center energy use grew 6 percent⁷.

Compute Grew Five Times Faster Than Energy Use

Change in global data center metrics, 2010 to 2018 (Masanet et al., Science, 2020).



Source: Masanet, Shehabi, Lei, Smith, Koomey, Science 367(6481), 2020

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Figure 5. Compute grew five times faster than energy use

That efficiency curve continues in the AI era. The IEA reports the energy required per AI task is falling by roughly an order of magnitude each year through hardware, model, and software improvements⁵⁰. Google reports the energy for a median Gemini text prompt fell 33 fold in twelve months³⁸. Google's fleet power usage effectiveness sits at 1.09, meaning only 9 percent of energy is overhead, while the industry average is 1.56. DeepMind's machine learning control of Google's own cooling systems cut cooling energy by 40 percent.

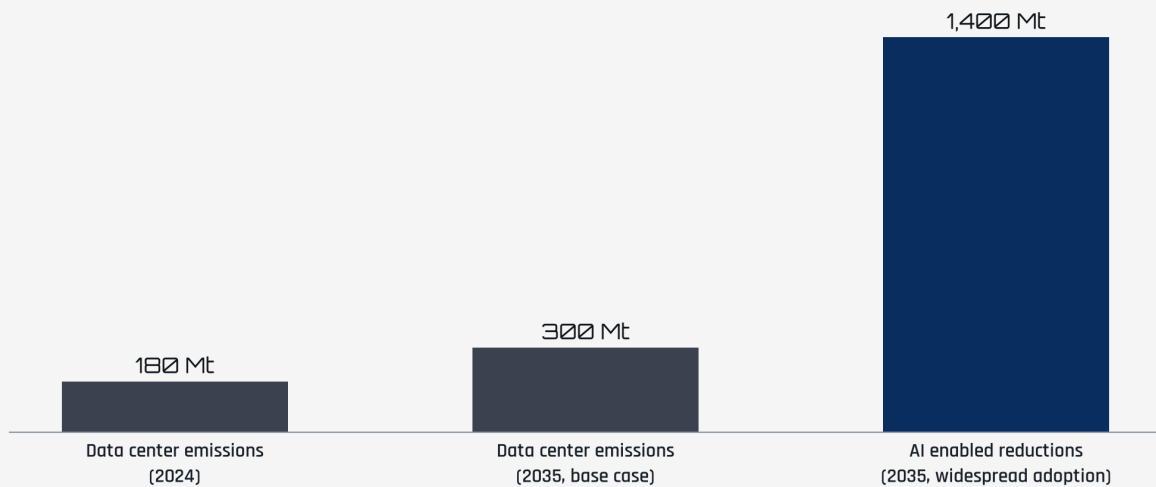
Efficiency does not cancel growth. Google's total electricity use rose 37 percent in 2025 even as per prompt energy collapsed, because demand grew faster than efficiency. The honest framing is that AI demand is real and rising, that efficiency gains are real and compounding, and that history has consistently favored the efficiency side of that race more than forecasters expected.

AI Is a Climate Tool

The IEA's 2025 Energy and AI report calculates that data centers emitted about 180 Mt of CO₂ in 2024, roughly 0.5 percent of global emissions, and may reach 300 Mt by 2035 in its base case. It also calculates that widespread adoption of existing AI applications in power systems, industry, buildings, and transport could reduce emissions by about 1,400 Mt a year by 2035, three to four times data center emissions⁸.

AI Enabled Emissions Cuts Could Reach Four Times Data Center Emissions

Million tonnes of CO₂ per year. IEA Energy and AI, 2025.



Source: IEA, Energy and AI (2025). The IEA notes there is no momentum yet that guarantees the reductions.

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Figure 6. AI enabled emissions cuts could reach four times data center emissions

The IEA is explicit that this outcome requires policy and adoption, writing that "there is currently no momentum that would ensure the widespread adoption of these AI applications"⁸. The potential is nonetheless documented in production systems today. GraphCast and GenCast forecast weather more accurately than the world's leading numerical models at a fraction of the compute, and Google's Flood Hub delivers seven day flood warnings to more than 700 million people across 100 countries. GNoME predicted 2.2 million new crystal structures, including candidates for better batteries and superconductors. Machine learning controllers now stabilize plasma in fusion reactors.

New Generation Is Following the Load

The buildout is financing the largest wave of new firm, clean generation in a generation. Meta, Amazon, Google, and Microsoft accounted for 49 percent of all corporate clean energy purchased worldwide in 2025 according to BloombergNEF. Constellation is restarting the 835 MW Crane Clean Energy Center at Three Mile Island under a 20 year Microsoft contract, with power expected in 2027⁵¹. Holtec began loading fuel at Palisades in Michigan on August 30, 2026, the first shuttered US nuclear plant ever to return to service⁵². NextEra and Google will restart Duane Arnold in Iowa by 2029, and Meta signed agreements for 6.6 GW of nuclear capacity. The IEA counts a pipeline of about 45 GW of small modular reactors tied to data center demand⁵⁰. Google signed a 396 MW enhanced geothermal power purchase agreement with Fervo on September 1, 2026, with an option toward roughly 1 GW by 2030⁵³. None of these plants would be under construction without AI load to underwrite them, and every one of them serves the surrounding grid for decades.

Where the Critics Have a Point

Electricity prices are the strongest argument against unchecked data center growth, and it deserves a direct answer. PJM capacity prices rose from \$28.92 per MW day in the 2024 to 2025 auction to \$329.17 for 2026 to 2027, and PJM's Independent Market Monitor attributes \$6.3 billion of the latest \$16.4 billion auction to data center load^{54, 55}. Seventy three percent of Virginia voters blame data centers for rising bills⁵⁶. xAI's Memphis campus ran gas turbines without full

permits and drew a civil rights lawsuit. A June 2026 academic paper finds the opposite effect on average retail rates nationally, where load growth spread fixed costs and modestly lowered rates from 2015 to 2024⁵⁷, which makes the rate question regional and unsettled rather than closed.

The answer is cost responsibility. Microsoft's Community First AI Infrastructure pledge commits to paying the full cost of its power, declining local tax breaks, and contracting 7.9 GW of new generation in MISO⁵⁸. Seven AI companies and hyperscalers signed a federal Ratepayer Protection Pledge in 2026⁵⁹. Virginia passed cost responsibility rules for loads above 25 MW⁶⁰. A data center that pays for its own generation, interconnection, and capacity is a ratepayer's ally, because it spreads the fixed cost of the grid across more load. That standard should be universal.

06

The Economic Case

The Scale of the Buildout

The AI infrastructure buildout is the largest private capital deployment in American history. Amazon, Alphabet, Microsoft, and Meta spent roughly \$402 to \$410 billion on capital expenditure in 2025 and guided to roughly \$720 to \$745 billion for 2026, a rise near 75 percent^{61, 62, 63, 64}. McKinsey estimates data centers will require \$6.7 trillion of capital worldwide by 2030, with \$5.2 trillion for AI workloads and more than 40 percent landing in the United States⁶⁵.

US data center construction spending reached about \$41 billion in 2025, up 344 percent since 2020, and surpassed office construction for the first time in December 2025⁶⁶. By July 2026 the annualized pace was \$75.2 billion, up 57 percent on the year, and a Federal Reserve Beige Book contact said the construction sector would be "in a recession" without it¹². US private AI investment reached \$285.9 billion in 2025, about 23 times China's total, and the United States hosts 5,427 data centers, more than ten times any other nation⁶⁷.

Metric	Figure	Source
Big four hyperscaler capex, 2025	\$402 to \$410 billion	GPUSmith ⁶⁸
Big four hyperscaler capex guidance, 2026	\$720 to \$745 billion	CreditSights ⁶⁹
Global data center capital need by 2030	\$6.7 trillion	McKinsey ⁶⁵
US data center construction, July 2026 annualized	\$75.2 billion	Census C30 analysis ¹²
US private AI investment, 2025	\$285.9 billion	Stanford HAI ⁶⁷
Stargate committed investment	\$500 billion by 2029	OpenAI ⁷⁰
Estimated US consumer surplus from AI, early 2026	\$172 billion per year	Stanford HAI ⁶⁷

Tax Base and Community Return

Loudoun County, Virginia is the clearest case study of what a mature data center economy returns to residents. Data center tax revenue grew from \$136.8 million and 11.3 percent of local tax funding in fiscal 2017 to \$1,135.7 million and 42 percent in fiscal 2026. About 200 facilities pay 83 percent of all business taxes in the county, a share comparable to roughly 140,000 residential parcels¹¹. That revenue allowed the Board of Supervisors to cut the real property tax rate from \$1.145 per \$100 of assessed value in 2016 to \$0.805 in 2026, a 30 percent reduction for every homeowner, while data center equipment stays taxed at \$4.15⁷¹.

The national picture, in a study commissioned by the industry, puts direct data center employment at just over one million in 2024 with total supported employment of 5.5 million, GDP contribution of \$927 billion, and \$204 billion of federal, state, and local tax support⁷². Community investment follows the campuses. Meta launched a \$1 billion fund for data center host communities in August 2026 and its Richland Parish, Louisiana campus funded \$50,000 one time bonuses for local teachers⁷³. Google committed \$50 million in 2026 to train more than 300,000 Americans in electrical, plumbing, sheet metal, and construction trades⁷⁴.

Where the Critics Have a Point

Independent research tempers the job claims. Brookings analyzed roughly 1,500 facilities from 2003 to 2024 and found counties receiving data centers saw about 100 to 200 new jobs in a typical county with average wages unchanged, while home prices rose 2 to 5 percent⁷⁵. Good Jobs First documents operating headcounts of 30 to 50 permanent staff at typical facilities⁷⁶. Virginia's sales tax exemption cost \$1.9 billion in fiscal 2025⁷⁷. Goldman Sachs found no meaningful economy wide productivity signal from AI adoption in Q4 2025 earnings, even as firms that quantified specific use cases reported a median 30 percent gain⁷⁸.

The honest economic case does not rest on permanent headcount inside the building. It rests on the tax base a facility carries with almost no demand on schools or roads, on the construction wages during a multi year build, on the generation and transmission it finances, and on the scientific and productivity output of the compute itself. Loudoun's 30 percent property tax cut is what a data center does for a resident who never sets foot inside one.

07

The Backbone of Daily Life

The public thinks of data centers as the home of chatbots. They are the home of everything.

When a CrowdStrike software update failed on July 19, 2024, 759 of 2,232 US hospitals studied lost services for a median of 5.1 hours, 911 systems went down in at least three states, and more than 10,000 flights were canceled or delayed^{79, 80, 81}. When a single Amazon Web Services region failed on October 20, 2025, banking sites, messaging apps, and home security systems went dark for roughly 2,000 companies⁸². Those outages measured, in the negative, how completely modern medicine, emergency response, and finance depend on this infrastructure.

The dependency delivers in the positive every day. Medicare telehealth visits rose 63 fold from 840,000 in 2019 to 52.7 million in 2020, letting 28 million beneficiaries see a doctor during a pandemic⁸³. ALERTCalifornia's 1,211 AI monitored cameras detected 1,668 wildfires in 2024, 636 of them before anyone called 911⁸⁴. Google's Flood Hub now covers 150 countries and more than two billion people, and a Nigeria pilot pairing its forecasts with anticipatory cash transfers cut food insecurity by 90 percent⁸⁵. A Harvard randomized trial found students learning physics with an AI tutor gained more than double what peers gained in an active lecture, with an effect size of 0.63 standard deviations⁸⁶. A World Bank pilot in Nigeria produced 0.3 standard deviations of learning gain in six weeks, equivalent to nearly two years of typical schooling⁸⁷. Be My AI resolved more than 90 percent of blind and low vision customer issues without a human agent⁸⁸.

Every one of these systems runs in a data center.

08

Governments Treat Compute as Strategic

The buildout enjoys support across party lines and across borders because governments understand what it is. Executive Order 14318 of July 2025 routes data centers above 100 MW through fast track federal permitting and opens federal and brownfield land, substantively recreating an order the prior administration issued six months earlier⁸⁹. America's AI Action Plan includes workforce initiatives for electricians and HVAC technicians by name⁹⁰. The United Kingdom designated five AI Growth Zones with £28.2 billion of committed investment and expanded public compute twenty fold in a year⁹¹. The European Union's InvestAI program aims to mobilize €200 billion including a €20 billion fund for AI gigafactories⁹².

Nations are not competing to host data centers because they misunderstand water. They are competing because the country that holds the compute holds the science, the industrial base, and the security position of the next half century.

What the Debate Should Be About

The evidence supports a clear position. Data centers are not a national water problem, are a manageable and historically overestimated energy demand, and carry a documented record of medical, scientific, and economic return. The evidence also supports specific accountability standards that the strongest operators already meet and that every community should demand.

Standard	The Practice	Already Proven By
Disclose water and power use before approval	Public metering, no NDAs on resource figures	Tucson's 2026 large scale data center code
Cool without evaporating local water where stressed	Closed loop or zero water cooling, reclaimed water	Microsoft zero water design, Meta Kuna ⁴⁴
Pay the full cost of power and grid connection	Cost responsibility for loads above 25 MW	Microsoft Community First pledge ⁵⁸ , Virginia 2026 law
Bring new firm clean generation with the load	Nuclear restarts, SMRs, geothermal PPAs	Crane, Palisades, Fervo
Replenish more water than consumed	Watershed restoration at 100 percent or above	Google 78 percent in 2025, Meta Kuna 149 million gallons a year
Train and hire locally	Trades programs, campus workforce pipelines	Google \$50 million trades commitment ⁷⁴

Communities that hold projects to this standard get a tax base, a modernized grid, a water system upgrade, and a share of the scientific dividend. Communities that ban the projects get none of those things, and the compute moves to the next county.

The Workforce Is the Constraint

Every standard in the table above is executed by a person. Closed loop cooling is commissioned by mechanical technicians. Cost responsible interconnection is engineered by power engineers. Nuclear restarts need licensed operators. Replenishment projects need hydrologists and project managers. The bottleneck on responsible infrastructure is not capital, and it is not technology. It is people.

Uptime Institute's staffing forecast projected global requirements rising to nearly 2.3 million full time equivalents across more than 230 specialist roles by 2025, and its 2025 survey of 650 operators found 46 percent struggle to find qualified candidates and 37 percent struggle to retain them^{93, 94}. Data center construction workers already earn about 32 percent more than other construction workers⁹⁵. The industry is asking a workforce that does not yet exist to build the most important infrastructure of the century, faster than any infrastructure has ever been built, to a higher environmental standard than any industry has ever met.

This is the market Data Center Youngbloods serves. DCYB builds the community, training, and placement pipeline for the next generation of digital infrastructure professionals, with more than 1,000 members already inside the network. The company's thesis is simple. The AI buildout is the largest opportunity of the decade for anyone willing to learn the trade, and the industry's ability to earn public trust depends on filling those roles with people who understand both the technology and the responsibility.

11

Conclusion

The average person encounters AI as a chatbot and encounters data centers as a windowless building on the edge of town. Neither impression captures what the infrastructure does. Behind those walls, models have solved protein folding, designed a drug that reverses lung decline, found antibiotics that kill resistant bacteria, caught cancers radiologists missed, warned two billion people of floods, and detected wildfires before the first phone call. The next generation of that compute will do more, and it will do it with less water and less energy per unit of work than any computing generation before it.

The debate over water and energy is worth having on accurate terms. Every data center in America uses one thirtieth of the water of America's golf courses. Compute grew 550 percent in a decade while its energy grew 6 percent. AI enabled efficiencies could cut four times the carbon that data centers emit. Where real local costs exist, in stressed aquifers and constrained grids, the solutions are already in production at the best operated campuses, and communities are right to demand them.

The next generation of digital infrastructure is a bet that humanity can build its way to better medicine, cleaner energy, and broader prosperity. The evidence says the bet is already paying. What the buildout needs now is the workforce to deliver it responsibly, and the public conversation to match the facts.

The Next Generation of Digital Infrastructure.

Luke Adams, Founder and CEO

Book a Meeting · DCYB.AI

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