Kat Taylor Testimony on **L.D. 912** ***An Act to Address the Use of Electricity by Data Centers***

Thursday, April 3, 2025

My name is Kat Taylor and I am a resident and property owner in Argyle Twp. located 20 miles north of Bangor. I am a former IT professional.

I am neither for nor against LD 912 in its present form as it only seems to address electric usage from in front of the meter generation **and may not be focusing on other resource drains.**

We must always turn a critical eye towards anything new in technology asking first "What problem does this solve?" and also "What problem does this create?"

We are at a event horizon where the world will be seen as **before and after AI.**

We cannot, and should not, prevent the future of AI. But we can influence how it will be developed and how we participate in that development and subsequent use.

The Jevons Paradox applies to our rate of energy consumption. Rather than using less energy we use more:

> *"**Cloud computing** is more efficient than traditional computing, but its **ease and efficiency have led companies to consume far more computing power and data storage than ever before**. This showcases the Jevons Paradox because the **overall consumption of computing resources has gone up** as they've become **more accessible** and **efficient**."*

Unlimited use lends to unlimited drains on resources; advocates of AI should strive to make the public aware of the impacts usage has on resource depletion.
Maine is struggling to accommodate the energy demands we have today without adding the complex components of data centers.

The **immense investment in infrastructure** to transmit energy is slowing data center development. According to industry experts, **generation costs run around $10-20b annually** where **T&D costs** to **service demand** are **$200 to $600b annually**.

In addition to using **vast amounts of electricity** there are **huge amounts of water** needed for cooling servers, **water vapor** (Greenhouse Gas (GHG)) **emissions** result from cooling and **robust broadband internet access** is also needed to connect the center to the world.

Even if data centers are sited in remote areas, where land and permitting may be more affordable or accessible, there is usually no abundant water supply or broadband capability available.

Colocating facilities next to generation sources lessens the demand on T&D development, lessening environmental impacts. While not a scalable permanent

solution, colocation could allow easier permitting, quicker deployment of service while the T&D Utilities work on upgrading their infrastructure to eventually meet the need or if companies build and utilize behind the meter generation sources.

This is one of the main reasons Big Tech is reviving Nuclear Fission reactors to run their data centers. **Microsoft bought Three Mile Island** with the intent of restarting nuclear fission energy and **using 100% of the electricity generated**.

However, using nuclear fission exacerbates the cooling problem since both reactors and AI servers will be using water as a coolant. Our water bodies are getting warmer each year. How long will it be before the water no longer works? Alternative cooling solutions are still in development as are new nuclear reactors.

Meanwhile, water vapor adds to the GHG impacts creating a cycle of warmer environments needing more water to cool equipment.

To boil it all down, **I think we have about 3-5 years to counter the misinformation regarding the true benefits of AI**, the **inescapable public relations** telling us it is inevitable, the **impact** it is having **on the climate** and the **massive T&D investments** on **near-term solutions** that will **delay actual renewable energy progress** and **lock us into paying stranded costs** indefinitely.

We can't stop the Juggernaut of AI but we can get in front of its deployment by fully **informing the public of the environmental and social consequences instead of burdening ratepayers with ill advised investments.**

New technology is always popular at first. We like bright shiny things and developers struggle to come up with new "cool" features to attract users.
We need to resist embracing the new simply because it is new.

So instead of calculating how much in front of the meter energy to allocate to data centers, perhaps we should be wondering if they are a good fit for Maine at all?

At this time, given the lack of robust broadband available, the aging condition of our grid and our dependency on fossil fuel generation and imported hydroelectric from Canada, data centers are not a good return on investment for Maine.

Respectfully,

Kat Taylor
Argyle Twp.

Artificial Intelligence: How AI is playing a role in climate change

Author: Aaron Myler
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newscentermaine.com
3–4 minutes

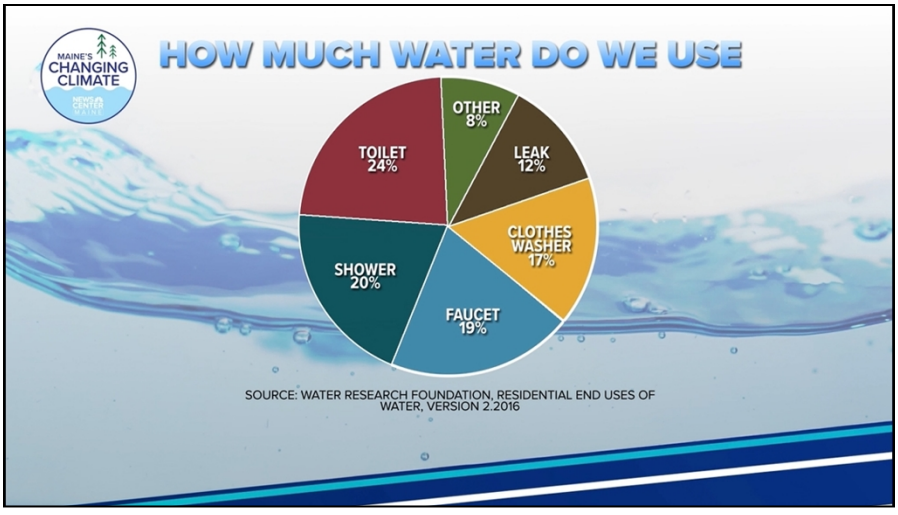
MAINE, USA — Artificial intelligence is transforming industries across the globe, from health care and education to tackling climate change and so much more.

But while AI has led to significant advancements, like tracking greenhouse gas emissions and sand dredging, its rise comes with an environmental cost. **The infrastructure required to power AI is immense, demanding vast amounts of water and electricity.**

According to the International Energy Agency, **a typical Google search consumes about 0.3 watt-hours of electricity,** while **a ChatGPT request uses an average of 2.9 watt-hours—nearly 10 times more.**

According to the United Nations Environment Programme, **data centers that run AI operations produce massive amounts of electronic waste and depend heavily on critical resources—particularly freshwater.**

Data centers are notorious for being physically hot, requiring substantial water to keep them cool. **In 2021, Google revealed that its data centers used an average of 450,000 gallons of water per day.** For context, **the average American uses about 82 gallons of water daily,** with activities like flushing toilets, showering, and running faucets as the top contributors.

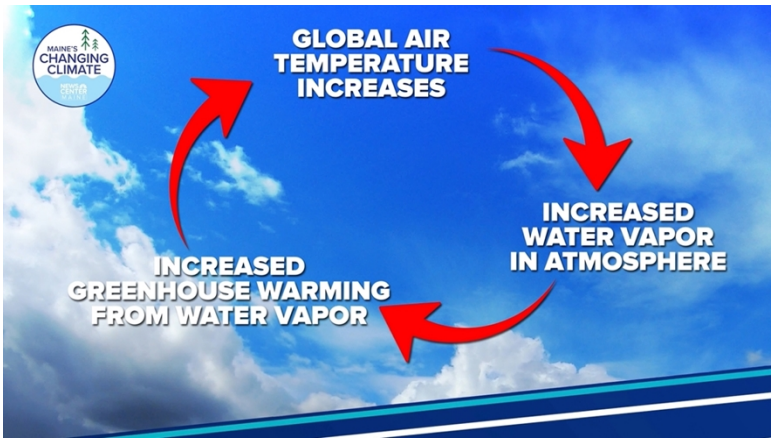


This means **Google's data centers are using the same amount of water as roughly <u>5,500 people</u> every *single* day**.

But why is this a problem? **Only about <u>3 percent</u> of Earth's water is fresh.** Of that, **<u>2.5 percent</u> is locked away in glaciers and ice caps**. That leaves **just <u>0.5 percent</u> of accessible freshwater available for human use**. AI and its supporting **data centers are consuming this limited resource at rapid rate.**

To make matters worse, **these data centers sometimes operate in regions already struggling with limited access to clean water**, exacerbating the issue.

Once the equipment is cooled, the <u>byproduct is water vapor</u>, which **is released into the atmosphere**. **<u>Water vapor is the most abundant greenhouse gas</u>, and the more vapor there is in the air, the more heat it can trap.** As warmer air can hold more moisture, **this sets off <u>a vicious cycle of increasing temperatures</u> and more water vapor.**



So, what can we do about it?

The **United Nations Environment Programme suggests a multi-faceted approach: policy change, a shift to renewable energy, and more efficient algorithms.**

By making AI systems more efficient and sustainable, we can reduce their reliance on precious resources like water and electricity.

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What we can VERIFY about AI and its environmental impact

Emery Winter
7–8 minutes

The boom in AI has led to a boom in AI data centers. Several readers asked us to **VERIFY how these hubs use water and electricity.**

The use and prevalence of generative artificial intelligence (AI) technology has ballooned over the past few years. This includes the growth of **chatbots** like ChatGPT and **image generators** like Midjourney.

As AI has become ubiquitous, people have raised concerns about the environmental impacts of the technology. **One of the more common criticisms is that it requires more water and power than older technology.**

Some people have drawn links between this resource use, climate change and the wildfires in Los Angeles. **A viral post from Instagram that has since been reshared many times claimed that a single interaction with ChatGPT uses 10 times the amount of energy as a Google search.**

Readers Olive and Dean also **asked us to VERIFY the impact artificial intelligence has on water and power usage.**

THE SOURCES

- International Energy Agency (IEA)
- University of Illinois Urbana-Champaign's Center for Secure Water
- Article on AI energy crisis published by Nature
- Google's 2024 Environmental Report
- 2023 study by engineering researchers from the University of California, Riverside
- 2023 study by researcher with Digiconomist, a research company focused on unintended consequences of digital trends
- Sunbird, a company that makes data center management software

WHAT WE FOUND

Our current online world relies on vast amounts of computers and data centers to operate. These centers power everything we do online, from conducting internet searches to streaming movies.

Artificial intelligence is more sophisticated than a regular web search or movie stream. It **requires exponentially more computing power to complete what may seem like simple tasks.**

The AI boom has thus led to a rise in new data centers, too. These new data centers that support the additional computing power required are the source of AI's outsized environmental impact.

How AI uses electricity

An AI tool like **ChatGPT relies on large amounts of data and equally large amounts of computer processing power to provide a result.** Tech companies keep computer systems to store this data and run programs to process it in physical locations called data centers.

When someone gives an **AI** program a prompt, it **uses computational power** to sift through and process all of that data, Katherine Bourzac, a science writer for Nature journals, wrote in a 2024 article. **The more computational power used, the more electricity is needed.**

How AI uses water

It's not just electricity **data centers** need more of when they use more computational power; they also **need more water**, according to the University of Illinois Urbana-Champaign's Center for Secure Water.

The **more power** a computer uses, the **more heat** it generates. If a computer gets too hot, it'll start running into problems. That's why laptops and personal computers have fans inside of them that spin faster when the computer works harder.

Many data centers use industrial-sized fans to do the same thing on a large scale. However, **traditional air cooling isn't always enough to dissipate the amount of heat generated by all of the computer power AI uses**, according to Sunbird, a data center management software company. So **AI data centers use liquid coolants**, which absorb and transfer heat better than air does.

When data centers use water as their liquid coolant, the **water is pumped through pipes** surrounding the center's equipment, where it **absorbs excess heat** and is **then typically pumped back out** through a heat exchanger to a coolant tower, **where the water evaporates**. That means these **data centers need a constant source of water** to run through their systems.

AI resource usage by the numbers

The **average electricity demand of a typical Google search without AI is 0.3 Wh (watt-hours) of electricity,** while the **average electricity demand of a ChatGPT request is 2.9 Wh**, according to the **International Energy Agency (IEA)**.

In 2023, **John Hennessy, chairman of Google parent company Alphabet**, told Reuters that he **predicted** an exchange with an **AI chatbot would likely be 10 times more energy intensive than a standard Google search without AI.**

While 0.3 to 2.9 Wh might not seem like much (a toaster typically uses 10 to 160 Wh per use), those numbers add up. In 2021, **before Google began integrating AI** overviews **into its search engine**, **Google consumed more than 18 trillion watt-hours of electricity,** according to a study by a researcher with Digiconomist. At that time, **AI accounted for 10-15%** of the **total electricity** Google used.

Various estimates within that study estimated that **Google search integrated with AI could use between 6.9 and 8.9 Wh per search**. **Google didn't include the total amount of electricity it consumed in its most recent environmental report,** but Google did say that **in 2023 it released 37% more emissions from using electricity than it did in 2022**.

Google said the increase in emissions was primarily because **its increasing demand for electricity for its data centers outpaced its ability to bring more carbon-free energy projects online.**

In its **most recent environmental report, Google reported it consumed 14% more water in 2023 than** it did in **2022**. This is "primarily **due to water cooling needs**" **at** Google's **data centers**, "**which experienced increased electricity consumption year-over-year**."

The exact amount of water used to cool the machines in a data center can depend on the data center's design and location; **data centers in hotter locations need more water for cooling.**

On average, **data centers can consume approximately 1-9 liters of water per kWh of server energy,** according to an estimate from engineering researchers at the University of California, Riverside.