Data Centers Require Water and Power

NOTE: Below is a compilation of just a few of many articles pertaining to the water and energy consumption by the "communication industry".

We are not sure if it is even possible to get an accurate figure as to the number of data centers in Montana and throughout the rest of the country, particularly when you add state and federal government data centers into the mix.

According to our internet summarizer:

Data centers are one of the most energy-intensive building types, consuming 10 to 50 times the energy per floor space of a typical commercial office building.

In the United States, data center electricity consumption increased by about 4% from 2010-2014, a large shift from the 24% percent increase estimated from 2005-2010 and the nearly 90% increase estimated from 2000-2005. Energy use is expected to continue increasing in the near future….

[06/2021 Drought-stricken communities push back against data centers](#)

As cash-strapped cities welcome Big Tech to build hundreds of million-dollar data centers in their backyards, critics question the environmental cost.

Many data center operators are drawn to water-starved regions in the West, in part due to the availability of solar and wind energy.

Researchers at Virginia Tech estimate that one-fifth of data centers draw water from moderately to highly stressed watersheds, mostly in the Western United States, according to a [paper published in April.](#)
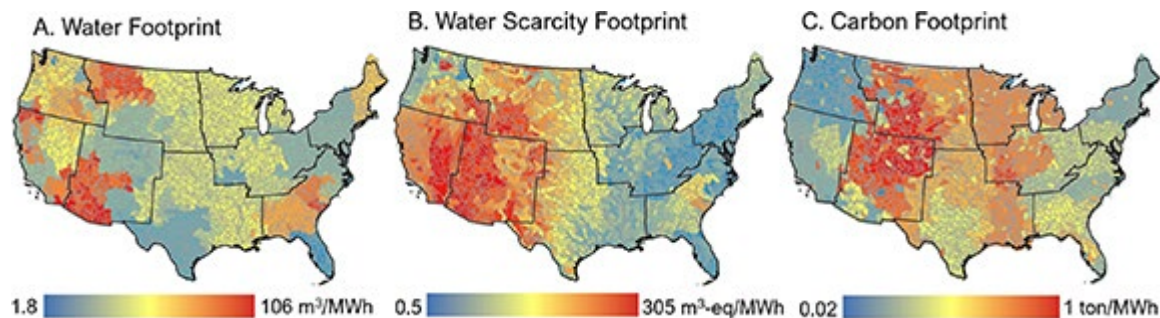

Figure 4. A data center's environmental footprint is highly contingent on where it is located. The (A) water intensity (m^3 MWh^{-1}), (B) water scarcity intensity (m^3 US-eq MWh^{-1}), and (C) GHG emissions intensity (tons CO_2-eq MWh^{-1}) of a hypothetical 1 MW data center placed in each of the 2110 subbasins of the continental United States.

The amount of data created and stored globally is expected to reach 175 Zettabytes by 2025, representing nearly a six-fold increase from 2018 [51]. The role of data centers in storing, managing, and distributing data has remained largely out of view of those dependent on their services. ***Similarly, the environmental implications of data centers have been obscured from public view.***

Here, for the first time, we estimate the water and carbon footprints of the US data center industry using infrastructure and facility-level data. Data centers heavy reliance on water scarce basins to supply their direct and indirect water requirements not only highlight the industry's role in local water scarcity, but also exposes potential risk since water stress is expected to increase in many watersheds due to increases in water demands and more intense, prolonged droughts due to climate change [52–54]. For these reasons, environmental considerations may warrant attention alongside typical infrastructure, regulatory, workforce, customer/client proximity, economic, and tax considerations when locating new data centers.

[10/2021 We are ignoring the true cost of water-guzzling data centers](#)

Data centers accounted for around 1% or 2% of global electricity demand in 2020. All that processing power generates lots of heat, so data centers must keep cool to prevent damage. While some companies are using cool air on mountain sites and Microsoft has used the cold waters of Scotland to experiment with underwater data centers, up to 43% of data center electricity in the U.S. is used for cooling.

This energy goes into cooling water which is either sprayed into air flowing past the servers, or evaporated to transfer heat away from the servers. Not only is energy required to cool the water (unless the system is specifically designed as a closed loop) but that water is lost as it evaporates. In a relatively small 1 megawatt data center (that uses enough electricity to power 1,000 houses), these traditional types of cooling would use 26 million liters of water per year.

Note: So if these figures are correct, a one megawatt data center translates to 6.9 million gallons of water per year.

The Daines / Gianforte / CSKT Polson Data Center is 50 megawatts, which could require as much as 344 million gallons of water per year.

[2016 United States Data Center Energy Usage Report](#)

[04/2020 The Secret Cost of Google's Data Centers: Billions of Gallons of Water to Cool Servers](#)

Google is building more data centers across the U.S. to power online searches, web advertising and cloud services. The company has boasted for years that these huge computer-filled warehouses are energy efficient and environmentally friendly. But there's a cost that the company tries to keep secret. These facilities use billions of gallons of water, sometimes in dry areas that are struggling to conserve this limited public resource

[2015 On Global Electricity Usage of Communication Technology: Trends to 2030](#)

This work presents an estimation of the global electricity usage that can be ascribed to Communication Technology (CT) between 2010 and 2030. The scope is three scenarios for use and production of consumer devices, communication networks and data centers. Three different scenarios, best, expected, and worst, are set up, which include annual numbers of sold devices, data traffic and electricity intensities/efficiencies.

The most significant trend, regardless of scenario, is that the proportion of use-stage electricity by consumer devices will decrease and will be transferred to the networks and data centers. Still, it seems like wireless access networks will not be the main driver for electricity use.

The analysis shows that for the worst-case scenario, CT could use as much as 51% of global electricity in 2030. *This will happen if not enough improvement in electricity efficiency of wireless access networks and fixed access networks/data centers is possible. However, until 2030, globally-generated renewable electricity is likely to exceed the electricity demand of all networks and data centers.*

Nevertheless, the present investigation suggests, for the worst case scenario, that CT electricity usage could contribute up to 23% of the globally released greenhouse gas emissions in 2030.

Note: We can't help but wonder how much energy and other resources are used for the United States government spying upon the world and its citizens?

09/2022 The trouble with data center energy figures

What impact does the entire data center sector have on world energy consumption? It's an important question for policymakers - but it seems the answers we have are not reliable.

Most data center professionals will shrug, and say facilities use "about two percent of the world's electricity." They'll say the figure came from a newspaper article, an analyst firm, or from their own marketing department's slide deck. They may also say they have heard data center energy use is plateauing, thanks to virtualization and the cloud.

Others will give a higher figure, saying that data centers use seven percent of electricity or more in some counties, and are on track to use 51 percent of the world's electricity by 2030 Ask them where the figure came from, and they will quote a different set of newspaper pieces, analysts and marketing literature.
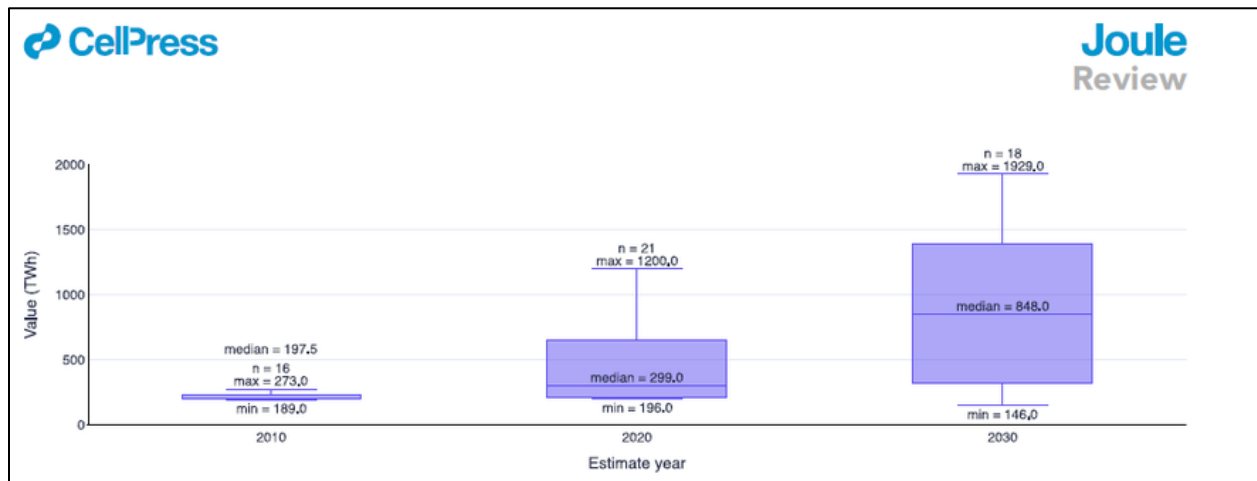

Fig 1: Global data center energy estimates for 2010, 2020, and 2030 in TWh. There is a wide range of estimates, which expands as forecasters look further into the future. The whiskers indicate the minimum and maximum values. Five estimates between 2,000 TWh and 8,253 were omitted to allow for scaling.– Mytton & Ashtine / Joule