



AI Data Center Energy Use Analysis

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Introduction and assumptions:

Based on the recent [draft Strategic Energy Assessment](#)¹ from the Public Service Commission, three AI data centers will drive peak load growth in Wisconsin up 4.17 GW by 2032. In this analysis, we contextualize this data center energy demand by comparing it to household electricity consumption in Wisconsin.

Power is measure of the rate at which electricity is being consumed. Household energy consumption is measured in kilowatt-hours (kWh). Energy consumption is the total amount of electricity used over time (i.e., multiplying power by time).

Thus, to facilitate this analysis and directly compare power vs. energy numbers, we had to make a simplifying assumption of household energy use. We applied average monthly household electricity consumption in Wisconsin across all 12 months, assuming a continuous power draw. This results in an approximate average power demand of a Wisconsin household to compare to AI data center demand.

Analysis Calculations:

According to the most recent data available, Wisconsin household average monthly electricity consumption in 2024 was 645 kWh, lower than the national average of 863 kWh.²

Extrapolating monthly across an entire year, this works out to 7,896 kWh of electricity consumption per year:

$$658 \text{ kWh} \times 12 = 7,740 \text{ kWh}$$

Assuming a continuous power draw, this is equivalent to a power demand of 0.9 kW per home:

$$7,896 \text{ kWh} \div 8,760 \text{ hours per year} = 0.884 \text{ kW}$$

¹ <https://apps.psc.wi.gov/ERF/ERFview/viewdoc.aspx?docid=595734>

² https://www.eia.gov/electricity/sales_revenue_price/pdf/table_5A.pdf

Converting kilowatt power demand to gigawatt power demand:

$$0.884 \text{ kW} \times \frac{1 \text{ GW}}{1,000,000 \text{ kW}} = 0.000000884 \text{ GW}$$

Calculating the number of homes to meet the same peak power demand as the three data centers:

$$\frac{4.17 \text{ GW}}{0.000000884 \text{ GW per home}} = 4,719,535 \text{ homes}$$

Using the analysis above, the comparison can be simplified further:

1GW of data center demand equals the power demand of about **1,131,783 Wisconsin Homes.**