

Involved with study that estimate 1-2 million square feet of raised floor (broken out data centers and office space)

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Gave a presentation last year using the following categorizations:

Size Category	Floor Area	Installed Servers
Small	15,000 ft ²	300-500
Medium	20,000 ft ²	1500-1700
Large	35,000 ft ²	N/A
Very Large	>100, 000 ft ²	N/A

Side Note

Monitoring Equipment

While the critical load is easy to measure, determining the load required to operate a data center can be difficult to obtain. Installed monitoring equipment may be the first step in increasing efficiency: it allows the data center to better understand their relative performance. Such an approach can also be used for reliability and predictive maintenance.

B: Impact on Electric Grid

This part of the report involves converting the energy savings estimated in the previous task to a peak load savings (using the National Energy Modeling System). To do this, we need to understand where the load savings will occur in the grid.

Peak Load Trends

The load is becoming more of a curve than a flat line, due to efficiency measures (economizers, weather) and project schedules (engineers submitting batch jobs on Friday to run over the weekend, rendering being performed at night)

While overall contribution to energy demand may be small (~1.2%), impact may be significant at certain location.

Migration Trends:

More data center consolidation in the Pacific Northwest due to cheap power. This power is cheap because of underutilized generation capacity, but prices will go up as capacity is used up.

The state of Montana is developing energy plans, expecting an increased demand once the rates in eastern Washington begin to increase.

Potential Solutions

Distributed Generation could alleviate peak demand, but a standby connection is always required, which is very expensive.

Thermal Energy Storage

C: Non energy impacts of improved efficiency

Reduced Cost

Potential downsizing due to efficient equipment

Lower maintenance

More efficient systems can delay having to add another facility

Increased Reliability

Running UPS at high efficiency levels extends the lives of electrical systems