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DATA REPORT

Tools to watch and improve power use by IT are underused

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Managers with responsibility for the IT at their facilities can do more to increase the work performed for each unit of energy consumed, Uptime Intelligence research suggests. Tools are available to help increase the utilization of server, storage and network equipment and reduce the power demand of the hardware at lower utilization levels, but they are often not used.

The Uptime Institute IT and Power Efficiency Survey 2023 asked data center operators about the data they are collecting as well as the metrics tracked to assess and report their work-per-energy performance. The results show that opportunities for reducing energy use and costs are often overlooked.

The Uptime Institute IT and Power Efficiency Survey 2023, conducted online in July 2023, had more than 500 end-user respondents. This report highlights some of the findings.

KEY POINTS

- Most organizations do not set a utilization objective for server fleets — this is particularly true for companies in North America and Europe.

- Fewer than half of operators track the key utilization and power demand data that is necessary to calculate a work-per-energy metric.

- Less than half of organizations test whether enabling server power management will affect performance, suggesting there are missed opportunities to reduce energy use.

- Of the organizations that enable server power management, most do so for more than 50% of the overall server fleet.
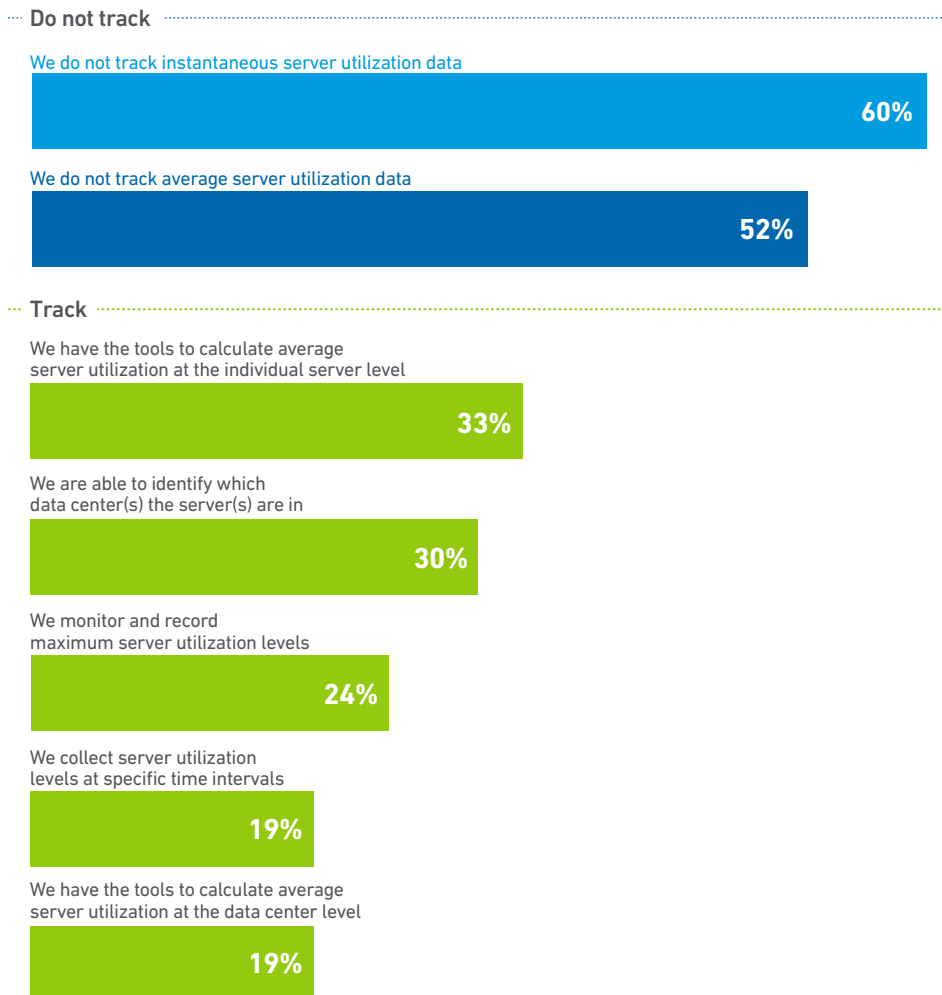
Most organizations do not track server utilization data

Tracking server utilization levels can be an important starting point for operators in reducing the energy use by IT — the biggest consumer of energy in a data center. However, more than half of organizations do not track this data (**Figure 1**), according to survey respondents. Operators monitor utilization to ensure that IT capacity is available to deliver work and ensure good response times — particularly during high-demand periods. However, utilization data can also inform decisions about improving energy efficiency.

Accurately measuring average server utilization is the first step in assessing work-per-energy performance. Utilization can be matched with server capacity values to calculate the delivered work in the data center. This value can then be divided by a server energy consumption measurement, or an estimate by adjusting the IT energy measurement used to calculate the power usage effectiveness, to generate a work-per-energy metric for a whole server fleet. However, less than one-third of survey respondents can calculate this useful metric using existing data.

Figure 1

Which of the following statements best describes how you track instantaneous and average server utilization data? Choose all that apply. (n=349)

Do not track

We do not track instantaneous server utilization data

60%

We do not track average server utilization data

52%

Track

We have the tools to calculate average server utilization at the individual server level

33%

We are able to identify which data center(s) the server(s) are in

30%

We monitor and record maximum server utilization levels

24%

We collect server utilization levels at specific time intervals

19%

We have the tools to calculate average server utilization at the data center level

19%

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Less than half set utilization targets for servers

Despite a growing need to reduce IT energy use, less than half of operators (46%, n=212) globally set targets to increase server utilization levels, according to survey respondents. A regional view of the data reveals that in Europe and North America, fewer organizations set utilization objectives for servers than their counterparts elsewhere (**Figure 2**). Companies in Asia-Pacific, Latin America, the Middle East and Africa may be more likely to do so because of tighter budgets and concerns about energy availability, which both leave little room for inefficiency.

This is expected to change over time. Data center operators in North America and Europe, which tend to have larger facilities, will become more incentivized to set these targets due to the impact of regulatory requirements and the possibility of significant energy cost savings. A breakout by data center capacity size reveals that 60% of facilities with more than 10 megawatts (MW) of installed IT capacity (n=40) set utilization objectives — a 17 percentage point difference compared with smaller facilities (43%, n=168).

Figure 2
Does your organization set a utilization objective for your server fleet?
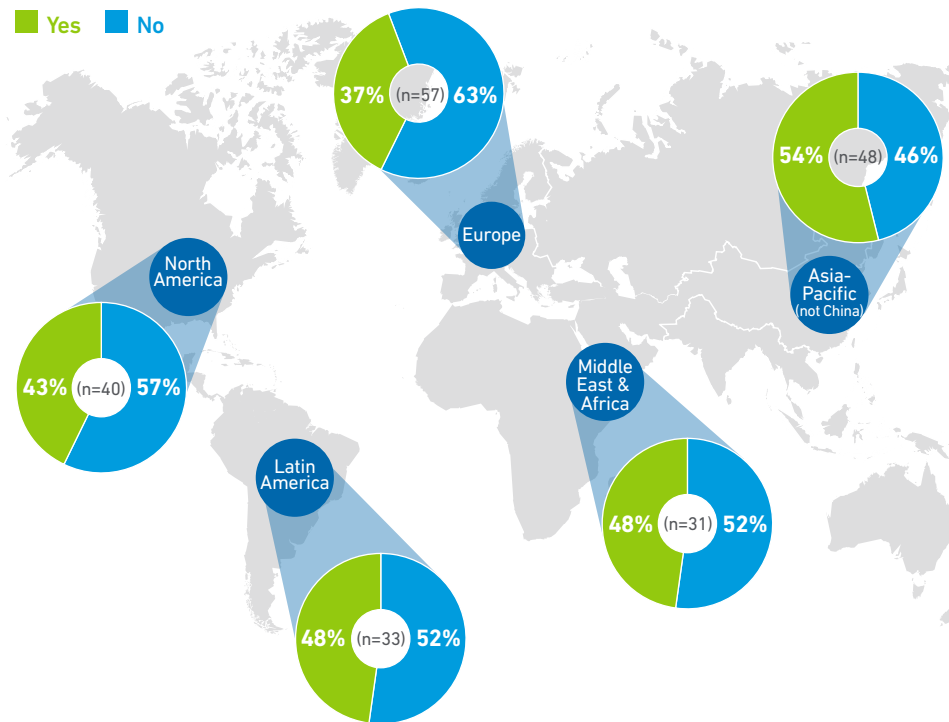
Responses for "Don't know" are not included in the chart

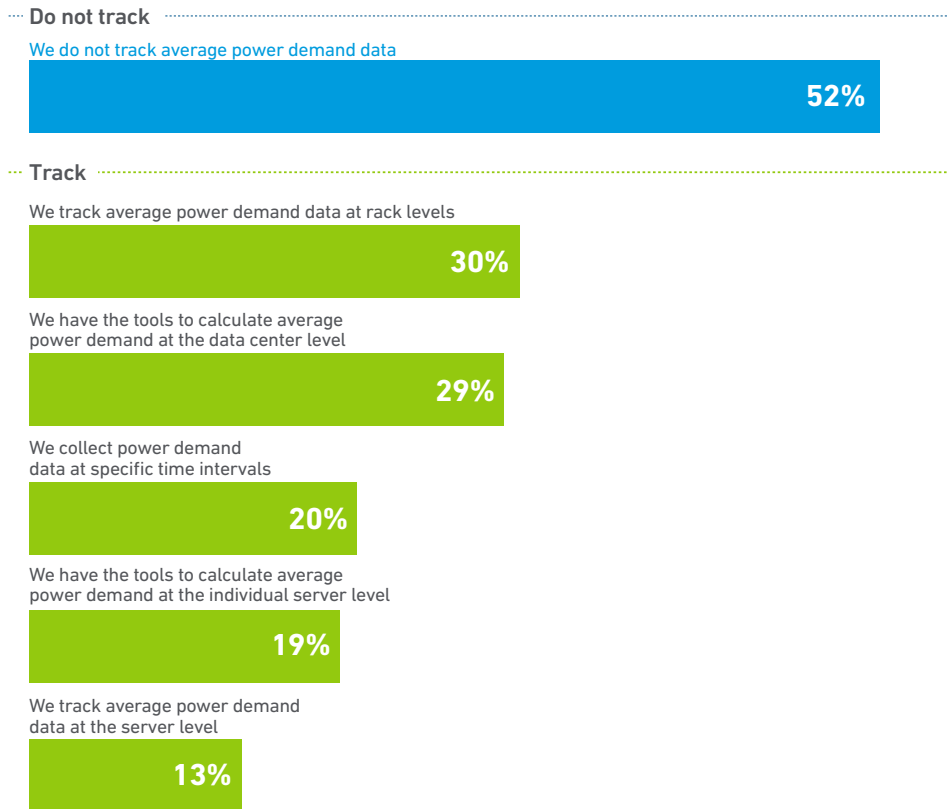UPTIME INSTITUTE IT AND POWER EFFICIENCY SURVEY 2023

More than half do not track server power demand data

Most data center operators appear to be missing valuable opportunities when it comes to understanding how their servers use power. More than half (52%) of organizations do not track average power demand data for their servers (**Figure 3**), which mirrors the high proportion of companies that do not record average server utilization data (see **Figure 1**). Both power demand and utilization are used by systems management teams in real time to help manage the power throttling of servers or prevent the overloading of circuits during high demand periods. However, less than one-third of survey respondents aggregate this data to report and analyze power usage at the server, rack or data center level.

Organizations that track this data regularly can use it to optimize their strategies for capacity planning and for managing facility power resources, which can lead to improving the overall efficiency of their operations. Managers can also use this data to satisfy the reporting and energy efficiency requirements that are emerging globally due to new regulations.

Figure 3
Which of the following statements best describes how you track average power demand data for server equipment? Choose all that apply. (n=349)

···· **Do not track** ···
We do not track average power demand data

52%	

···· **Track** ···
We track average power demand data at rack levels

30%

We have the tools to calculate average power demand at the data center level

29%

We collect power demand data at specific time intervals

20%

We have the tools to calculate average power demand at the individual server level

19%

We track average power demand data at the server level

13%

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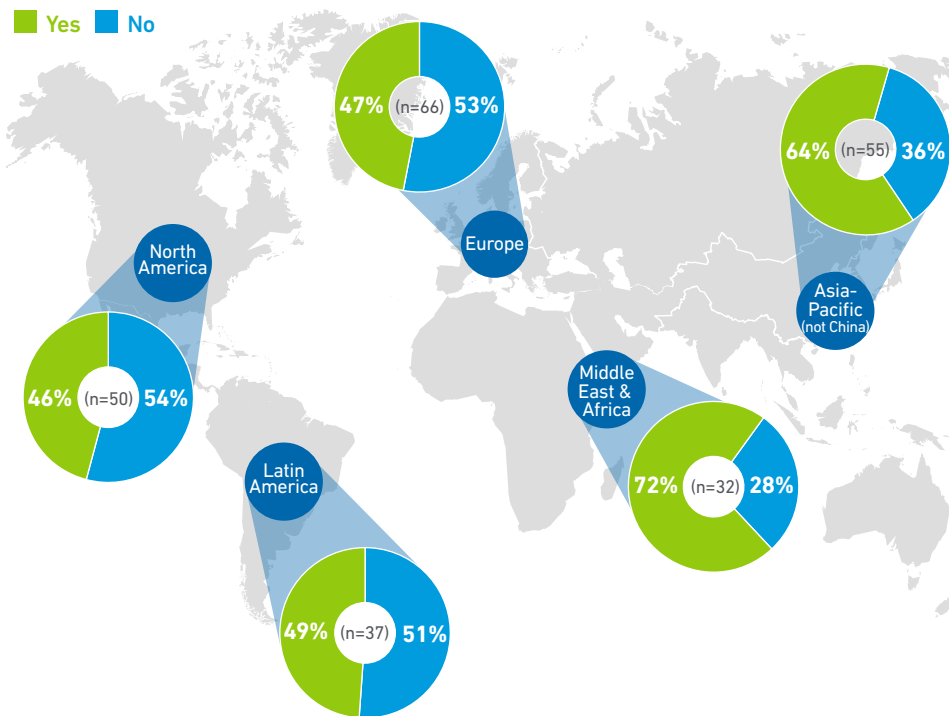## Policies for using server power management vary by region

It is widely said that IT managers mostly disable server power management after turning on the servers due to concerns about its potential impact on performance. Uptime Intelligence research shows, however, that the use of power management is widespread, if not strong (**Figure 4**).

Companies in Asia-Pacific, the Middle East and Africa are more likely to have policies for using server power management than their counterparts in other regions. As discussed in **Figure 1**, this is likely driven by access to capital and energy — and possible cultural attitudes toward waste. This widespread use of power management suggests that many organizations are successfully deploying the technology while maintaining the reliability and performance of their servers.

Further, larger facilities (i.e., greater than 10 MW of installed IT capacity) are more likely (71%, n=48) to have these policies in place than others (50%, n=185) by 21 percentage points. This suggests it is worthwhile investing resources in power management for applications that can withstand it due to the potentially significant energy savings.

Figure 4
Does your organization have a policy of using server power management where it is practical to do so?
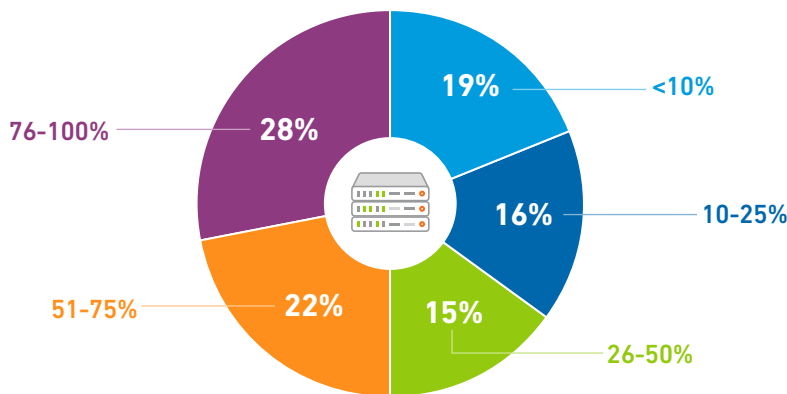

Responses for "Don't know" are not included in the chart

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Many enable server power management for most servers

Half of those organizations that enable server power management do so for at least 50% of their overall server fleet (**Figure 5**), according to survey respondents. While it may not be practical for all workload types, enabling even a small percentage of the server fleet with power management can lead to significant energy savings. For example, deploying power management to just 10% of the server fleet can lead to a 1% to 2% reduction in overall IT energy use. However, its use needs to be weighed against performance, application and customer requirements. Resources need to be dedicated to testing and ensuring power management functions do not risk the performance of critical applications.

Figure 5
What percentage of your organization's server fleet has server power management enabled? (n=163)

*Responses for "Don't know" are not included in the chart
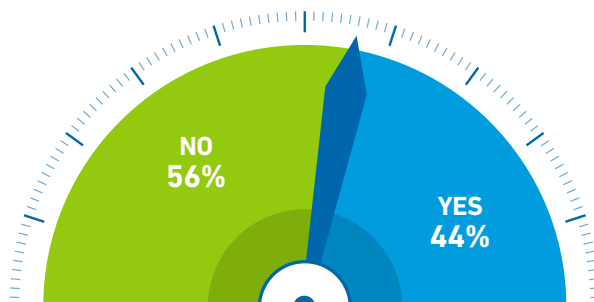
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Most do not test applications with power management

Less than half of organizations test applications to determine how they perform if server power management is enabled (**Figure 6**). Organizations with policies to use server power management (see **Figure 4**) are more likely to conduct these tests (67%, n=95) than others by 50 percentage points (17%, n=76), according to survey respondents. This suggests that a significant number of organizations overlook server power management as a way to reduce energy use and costs, even if it would be practical for a specific workload.

Figure 6
Do you test applications to determine how they perform with server power management enabled? (n=185)
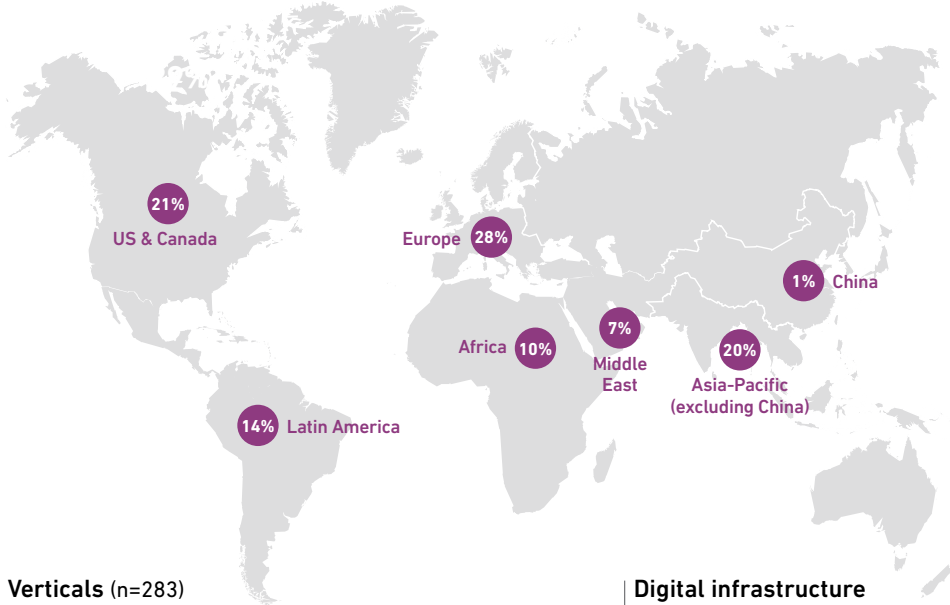

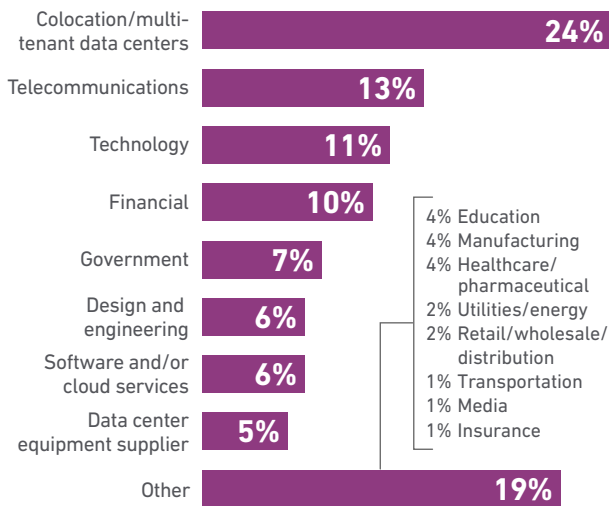UPTIME INSTITUTE IT AND POWER EFFICIENCY SURVEY 2023

Demographics:
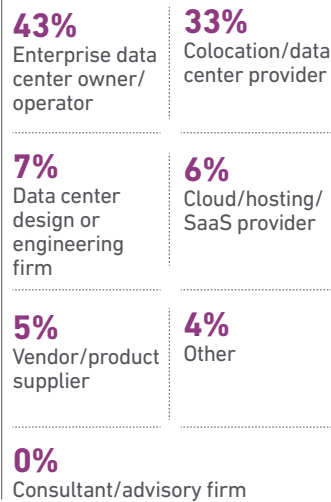## Uptime Institute IT and Power Efficiency Survey 2023

Company location (n=515)

21% US & Canada

28% Europe

1% China

10% Africa

7% Middle East

20% Asia-Pacific (excluding China)

14% Latin America

Verticals (n=283)

Vertical	%
Colocation/multi-tenant data centers	24%
Telecommunications	13%
Technology	11%
Financial	10%
Government	7%
Design and engineering	6%
Software and/or cloud services	6%
Data center equipment supplier	5%
Other	19%

4% Education
4% Manufacturing
4% Healthcare/pharmaceutical
2% Utilities/energy
2% Retail/wholesale/distribution
1% Transportation
1% Media
1% Insurance

Digital infrastructure environment (n=513)

43% Enterprise data center owner/operator

33% Colocation/data center provider

7% Data center design or engineering firm

6% Cloud/hosting/SaaS provider

5% Vendor/product supplier

4% Other

0% Consultant/advisory firm

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All general queries

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About Uptime Institute

Uptime Institute is the Global Digital Infrastructure Authority. Its Tier Standard is the IT industry's most trusted and adopted global standard for the proper design, construction, and operation of data centers – the backbone of the digital economy. For over 25 years, the company has served as the standard for data center reliability, sustainability, and efficiency, providing customers assurance that their digital infrastructure can perform at a level that is consistent with their business needs across a wide array of operating conditions.

With its data center Tier Standard & Certifications, Management & Operations reviews, broad range of related risk and performance assessments, and accredited educational curriculum completed by over 10,000 data center professionals, Uptime Institute has helped thousands of companies, in over 100 countries to optimize critical IT assets while managing costs, resources, and efficiency.

Uptime Institute is headquartered in New York, NY, with offices in Seattle, London, Sao Paulo, Dubai, Singapore and Taipei.

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