Data center energy storage 200 kWh

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Data centers are among the highest consumers of electric power. Studies have shown that data center energy consumption continues to increase annually, with two identifiable trends.

The first trend is that mainstream legacy corporate data centers continue to be major consumers of power, despite many organizations migrating systems and hardware to cloud environments. But, while average use is increasing steadily, it"s doing so at a lower rate than perhaps 20 years ago when cloud data centers were emerging as a major alternative to legacy facilities.

The other trend is that, while large cloud data centers, often called hyperscale centers, are steadily increasing their power usage, they"re balancing that increase by investing in green initiatives, such as energy-efficient equipment. They"re also revamping supporting systems such as HVAC, security and lighting.

The following paragraphs provide estimates and forecasts of data center energy consumption in the U.S. The data reinforces the importance of using energy-efficient equipment in data centers.

The "United States Data Center Energy Usage Report," published in June 2016 and supported by the Federal Energy Management Program of the U.S. Department of Energy, examined data center power usage back to the year 2000, presented analyses of how power usage has increased and offered forecasts of power usage in the early part of the current decade.

A more recent analysis of data center energy consumption patterns was published by Statista Inc. on Sept. 30, 2021. The report, "Global Data Centers Energy Demand by Type 2015-2021" by Nane S?nnichsen, found the following:

Traditional data centers globally have decreased their energy demand, from around 97.6 terawatt-hours in 2015, to some 50 terawatt-hours in 2019, and a forecast indicated that this figure will reach nearly 33 terawatt-hours by 2021. On the other hand, hyperscale data centers have doubled their energy demand in the same period of time.

The report also provided a year-by-year forecast of data center usage in three categories: traditional data centers, non-hyperscale cloud data centers and hyperscale cloud data centers.

Traditional data center operators are typically concerned with maximizing output and performance, often ignoring the power implications. For large organizations, the need for increased computing power often resulted in building additional data centers, significantly increasing energy consumption. The earlier years shown in the table above reflect this trend.

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However, the availability of significant computing resources without the need for floor space fueled the trend of shutting down legacy data centers and moving operations to the cloud.

Non-hyperscale cloud data centers demonstrate their use of energy-efficient equipment and environmental systems by keeping their energy consumption steady. Large, hyperscale cloud data centers have steadily increased their energy usage and effectively managed it for the same reasons.

Interestingly, if the columns in the table above are added across, the total energy demand in 2015 is 190.7 terawatt-hours, while the estimate demand for 2021 is 190.8 TWh. Again, this reflects how energy-efficient equipment and green data center operations keep energy costs under control.

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