Xcel Energy®

Data Center Efficiency

Building a green data center

Running a data center requires a tremendous amount of energy, and usage is on the rise. In fact, the EPA expects energy use to double every five years. If your business is running a data center, this presents a substantial opportunity to align business and environmental interests by making energy efficiency a priority in your technology management strategy.

The good news for all businesses is that adopting energy-saving, environmentally friendly data center practices can be both financially attractive and easy to implement. Xcel Energy is offering attractive cash rebates to offset the cost of putting your business on the green path to improving energy efficiency.

Examples of energy-efficient improvements

Companies are facing huge growth rates in data storage, resulting in a 20–30% increase in energy consumption each year, according to the Environmental Protection Agency (EPA). All this means that energy efficiency is more important than ever.

While the news may seem daunting, there are many things you can do to reduce the energy consumption of your data center—and Xcel Energy can help with the following:

- **Airflow improvements**—efficiently manage the proper amount of air needed to cool the servers in your data center. Strategies include: optimizing air inlet and return, minimizing the mixing of hot and cold air, and directing air only to where it is needed. All will improve the efficiency of air flow, which has a significant impact on the amount of fan energy needed to direct cooled air to the appropriate equipment.
- **Electrical equipment**—savings are available from higher efficiency batteries, transformers and inverters, high efficiency power supplies in IT cabinets, and high efficiency storage devices.
- **High-efficiency cooling equipment**—besides high efficiency chillers and roof top units, technology can raise the supply air temp to the racks by improving distribution of the air. This allows greater use of air side and water side economizers, which reduce the need for central plant cooling.
- **EC motor plug fans**—in computer room air conditioning/air handling (CRAC/CRAH) units, EC motors are used to directly drive backward inclined airfoil blade plug fans vs. using standard motors that are belt-driven, driving multiple, standard, forward-curved, squirrel cage fans. Plug fans are typically 30% more efficient than the standard forward-curved fans. They are inherently speed controllable, so you can control the speed without having to install a variable frequency drive.
- **Humidification**—best practices for data center operation have relaxed humidity controls to a range of 25–60%. Also, more efficient methods of humidifying include evaporative and ultrasonic mechanisms.

Achieve business sustainability

The Data Center Efficiency program is designed to help Xcel Energy customers address energy conservation opportunities in both new and existing data centers.

Data Center Efficiency improvements deliver energy savings and help you:

- Improve ROI of data management
- Manage increasing energy costs
- Improve reliability of data center performance

- **Power systems**—there are opportunities to improve efficiency using systems ranging from transformer to UPS (uninterruptible power supply) to high-efficiency power supply. In some cases, these new systems can be up to 15% more efficient than similar systems that are five or more years old.
- **High-efficiency lighting equipment**—although generally a small portion of the total energy usage in the data center (around five percent), there is opportunity to install higher-efficiency lighting when retrofitting existing or designing new data centers.
- **Plate and frame heat exchangers**—plate and frame heat exchangers save money by using outside air to cool the water, instead of your chiller. When operating with a cooling tower, a plate and frame heat exchanger (sometimes called a flat-plate heat exchanger) is a type of water-side economizer that uses metal plates to transfer heat between two fluids. It's well suited for transferring heat between medium- and low-pressure fluids.
- **High-efficiency servers**—experts estimate that new servers are 25% more efficient than standard servers, and ENERGY STAR® rated servers can be even more efficient.
- **Server virtualization/consolidation**—historically, software programs have been dedicated on a one-to-one relationship with servers. Virtualization software eliminates the need for dedicated servers. Consolidating allows servers to operate at a much higher load factor. Virtualization and consolidation can increase server load factors from a typical 10% to 50–70% without suffering any loss in reliability and may result in up to an 80% reduction in energy use.

How to evaluate your data center and earn rebates

Whether you are building a new data center, or looking to make energy efficiency improvements to an existing data center, Xcel Energy can help. We offer study rebates up to 75 percent, not to exceed $25,000, custom rebates up to $400 per kilowatt saved for preapproved projects and prescriptive rebates for EC motor plug fans and plate and frame heat exchangers (eligibility rules apply). A study is a good place to start and can help you:

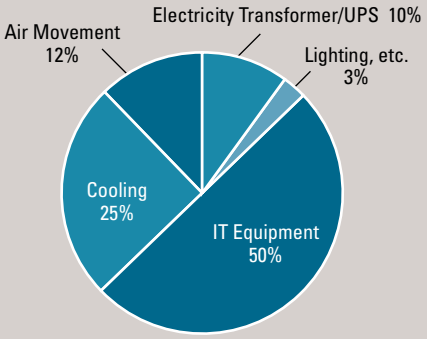
- Build a business case for project approval
- Detail how to best run your data center at peak efficiency
- Identify energy savings, cost estimates and rebate amounts for individual energy conservation opportunities

Call now and save. Contact your Xcel Energy account manager, or call our Business Solutions Center at **855.839.8862** for details.

Data Center Loads

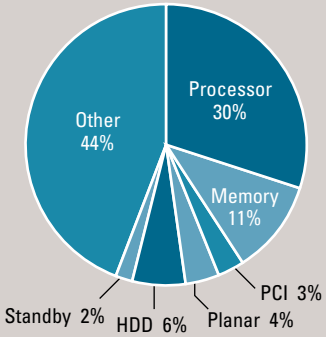
While servers and other IT equipment are the main power users, half the energy consumed is used to simply cool the equipment—which amounts to about 25% of a typical data center's energy consumption. Xcel Energy can help you find the right ways to reduce your consumption, and your energy bill.

Data Center Energy Usage



Source: EYP Mission Critical Facilities Inc., New York

IT Equipment Energy Usage



Source: IBM, US EPA CSC Data Center Seminar, December 2007

For more information and to download applications, visit **xcelenergy.com/DataCenterEfficiency**.