Overview

Data centers enable organizations across a wide range of sectors to carry out their distinct missions. These integral operations are energy intensive, consuming 10 to 40 times the energy per floor space of a typical commercial office building.[1] Consequently, the implementation of energy efficiency measures are poised to deliver substantial energy and monetary savings.

Demand for data center storage has never been higher. Commercial businesses employ a variety of data center operation models to suit their needs. While the commercial sector has shifted towards the emerging trends of colocation (multi-tenant data centers) and cloud services, company-managed small data centers and enterprise data centers are most common. The sophistication of commercial data centers, as well as how integral they are to day-to-day business operations, varies widely. This fact sheet summarizes some of the key needs, barriers, and opportunities related to data center management and operations in the Commercial Sector.

Needs

Resources for Commercial Data Centers
▶ Data Center Profiling Tools
▶ Master List of Efficiency Actions
▶ DCEP Training
▶ Energy Assessment Process Manual
▶ The Business Case for Energy Efficiency in Data Centers
▶ ESPC in Data Centers
▶ ENERGY STAR Score for Data Centers
▶ Portfolio Manager for Data Centers

▶ Demand for Capacity

Commercial businesses increasingly rely on data centers as a critical part of their operations. Activities across different business units are driving this demand, whether it be transitioning customer service towards online solutions, managing internal human resources operations, or managing and storing data as part of a business' service offerings. Businesses that adapt and innovate their data centers can be better equipped to accommodate this heightened demand.

▶ Reduce Management Burden

Commercial businesses are constantly looking to improve organizational efficiencies and cut costs, and mismatched server rooms that lack standardization can result in inefficiencies and a higher management burden for IT and Facilities staff. As data center needs expand, companies must strategize improvements that ensure that this expansion of capacity is manageable. To achieve this and avoid increased costs, data center expansion should be accompanied by operational efficiency gains. Aside from directly reducing company operating costs, many energy efficiency improvements streamline and improve previous data center configurations, which ultimately result in a lower management burden for staff.

▶ Risk Management & Reliability

The mission critical nature of data centers means reliability is a key consideration when devising new strategies and weighing the costs and benefits of energy efficiency upgrades. Data center outages and security breaches are not only costly but can lead to a loss of consumer confidence. Energy efficiency improvements often are accompanied by improved reliability (for example, energy efficiency measures can extend the life of existing facilities) allowing companies to ensure continuity of service for their customers. This enables companies to better meet customer needs and strengthens customer trust and confidence.

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[1] https://www.energy.gov/sites/prod/files/2013/11/f4/chp_data_centers.pdf

Barriers

▶ Split Incentives & Misaligned Interests

Different business units have their own priorities and challenges, with Facilities staff working to optimize rack and floor space, power availability, and equipment while IT staff try to ensure sufficient processing power, network bandwidth, and storage capacity to support upcoming IT initiatives. This is one example of how misaligned interests and split incentives can make data center energy efficiency projects more difficult to mobilize. Often, IT pays for upfront equipment costs while Facilities pays the energy bills. As a result, project champions may need to devote significant effort to shepherding data center energy efficiency projects that address the needs and clearly articulate the benefits for multiple stakeholders. However, because data center energy efficiency can deliver significant benefits to different departments, effective stakeholder engagement can help project champions overcome this barrier.

▶ Competition for Resources

Investing funds in data center energy efficiency may mean that a business is sacrificing elsewhere. In cases where businesses maintain and operate their own data centers, energy efficiency projects may be in fierce competition with other proposed investments. Champions must effectively convince stakeholders that funds are worthy of being allocated (whether that mean assembling a cross-functional task force or calculating a project's return on investment in a way that resonates). Given the energy intensity of data centers, energy efficiency investments consistently deliver a short payback period, quickly recovering initial investments through savings on energy expenditures.

▶ Risk Adversity

The critical role data centers play in a business' day-to-day operations can engender a culture of risk adversity. Certain business units may feel they have little to gain from implementing energy efficiency projects (particularly if energy expenditures are outside the realm of their responsibility). This also may be particularly true in organizations with dated equipment and an already vulnerable system. Energy efficiency investments typically improve data center reliability and resiliency and should be viewed as an effective risk management tool that benefits a wide range of stakeholders (including IT).

Opportunities

▶ Cost Savings and Avoidance

Data centers can represent a significant portion of a businesses' operating costs and typically are much more energy intensive per square foot than traditional office space. Operational savings for data centers have the potential to outweigh the upfront capital investment by a wide margin, with low (less than one year) payback periods and notable energy cost savings over the lifetime of the equipment.

▶ Outsourcing to Colocation Models & the Cloud

Many businesses that operate their own IT infrastructure are considering making the move to the colocation (colo) operation models or the cloud. Outsourcing data center operations to colo providers is a feasible alternative to the expansion or construction of new data centers as demand for capacity grows. Cloud computing also holds potential to reduce a data center's energy demand, shift capital expenditures to operating expenditures and provide IT flexibility that businesses need to accommodate future strategic and organizational changes.

▶ Virtualization & Consolidation

Businesses can leverage virtualization techniques (e.g. implementing virtual servers) to consolidate computing operations, enabling organizations to reduce the number of servers and increase server utilization. Benefits include lowering capital and operating costs, including physical hardware, infrastructure, real estate, and energy bills. Consolidation efforts can free up floor space and reduce the overall management burden by reducing infrastructure complexity, physical constraints, and staffing requirements. It also provides the opportunity to add new IT capacity if desired.

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