

Overview

Data centers enable organizations across a wide range of sectors to carry out their distinct missions. These integral operations represent just under two percent of overall energy consumption in the U.S.¹ However, implementation of energy efficiency measures could allow organizations to cut data center energy costs by 40 percent, resulting in substantial energy and monetary savings.²

The industrial sector employs a wide variety of data center operation models to suit their needs, including small data centers, enterprise, colocations, and high-performance computing (HPC).

This fact sheet summarizes some of the key needs, barriers, and opportunities related to data center management and operations in the Industrial Sector.



Needs

► Demand for Capacity

The industrial sector increasingly relies on data centers as a key component of their operations. A variety of activities are driving this demand- whether it be implementing automation technology to more closely manage a supply chain or using predictive analytics and real-time monitoring to improve operations. These changes are becoming increasingly necessary to keep up with global competition; as such, demand for capacity in this sector is expected to increase.

► Management Burden & Costs

Enterprises in the industrial sector are constantly looking to improve organizational efficiencies, reduce the management burden on staff, and cut costs. To achieve this and avoid increased costs, data center expansion should be accompanied by energy efficiency measures. Aside from directly reducing company operating costs, many energy efficiency improvements streamline and improve previous data center configurations, reducing the staffing and management burden.

► Risk Management & Reliability

The mission critical nature of data centers means reliability is a key consideration when devising new strategies and weighing the cost and benefits of energy efficiency upgrades. As the industrial sector integrates automation and more advanced performance monitoring into their core operations, maintaining data center uptime is ever more critical.

Resources for Industrial 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](#)
- [Opportunities for ESPC in Data Centers](#)
- [ENERGY STAR Score for Data Centers](#)
- [Portfolio Manager for Data Centers](#)

¹ https://eta-publications.lbl.gov/sites/default/files/lbni-1005775_v2.pdf

² <https://www.nrdc.org/sites/default/files/data-center-efficiency-assessment-IB.pdf>

Barriers

► Split Incentives & Misaligned Interests

Different business units have their own priorities and challenges—with facilities staff struggling with limits on 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. Project champions in the industrial sector may need to work to develop energy efficiency projects that key stakeholders can get on board with. Split incentives, in which one part of an organization pays for upfront equipment costs while another pays the energy bills (which frequently happens with a business' IT and Facilities departments) can reinforce these misaligned priorities and make it difficult to mobilize a project.

► Opportunity Cost of Capital & Competition for Resources

In cases where businesses maintain and operate their own data centers, energy efficiency projects may be in fierce competition with other proposed investments and capital expenditure (CapEx) projects. Given the sheer scale of operations in the industrial sector, upgrades may have a particularly high price tag. However, the benefits associated with increased automation, predictive analytics, and other data-center enabled improvements offer economic and strategic benefits to a wide range of business units. Champions must effectively convince stakeholders that funds are worthy of being allocated (whether that means assembling a cross-functional task force or calculating a project's return on investment in a way that resonates).

► Risk Adversity

The critical role data centers play in the industrial sector 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 less sophisticated operations- where obsolete equipment and infrastructure leads to the fear that changes (unless comprehensive), could prompt the failure of an already vulnerable system.

Opportunities

► Inherent Profit Motive

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 required by a company, with low (under a 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. Industrial enterprises are well positioned to take advantage of cloud services given the sheer scale of many manufacturing operations. Historical analysis of performance data can also help inform future plant improvements. Cloud computing holds great potential to reduce energy demand, shift CapEx to operating expenditures (OpEx), and provide IT flexibility that businesses need to accommodate future changes to stay ahead of the competition.

► Virtualization & Consolidation

Leveraging virtualization techniques enables companies to consolidate computing operations, reducing the number of servers required and increasing server utilization. Benefits include lowering capital and operating costs on multiple fronts - for everything from physical hardware to infrastructure and real estate to energy bills. Consolidation efforts can free up floor space and reduce the overall management burden- including infrastructure complexity, physical constraints, and staffing requirements. It also provides the opportunity to add new IT capacity if desired.