

Commercial Building Performance

Office Buildings



Sector Fact Sheet

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Commercial Building Performance

Office Buildings

CEE members have indicated increased interest in sector-specific commercial building programs (e.g., hospitals, schools, etc.).

To help members make a strong case for energy efficiency in the Office Buildings Market sector, CEE has compiled market intelligence from various sources.

This information describes the opportunity, some of the key decision-makers, challenges, potential program strategies and resources.

Energy Use and Savings Potential

Energy is a significant expenditure for commercial office space, representing about 19 percent of total building expenditures.

In a typical office building, lighting, heating and cooling represent more than 50 percent of total energy use, making those systems especially appropriate for focusing efficiency efforts.

Energy savings can be accomplished through retrofits, as a part of design and as individual behavior. Small actions can have significant benefits over time; for example, turning off one computer monitor after business hours saves approximately \$30 a year.

Managing the HVAC system, at a cost of pennies per square foot, can save up to 10-15 percent in energy bills, which amounts to approximately \$11,000 in annual savings for a 50,000-square-foot office building.

Savings in energy costs are translatable into important financial indicators for this sector. The ENERGY STAR® Financial Value Calculator indicates that a 30 percent savings in energy costs for an office space is equivalent to an increase of 4 percent in net operating income, which in turn supports a 4 percent increase in asset value.

Market Size and Growth

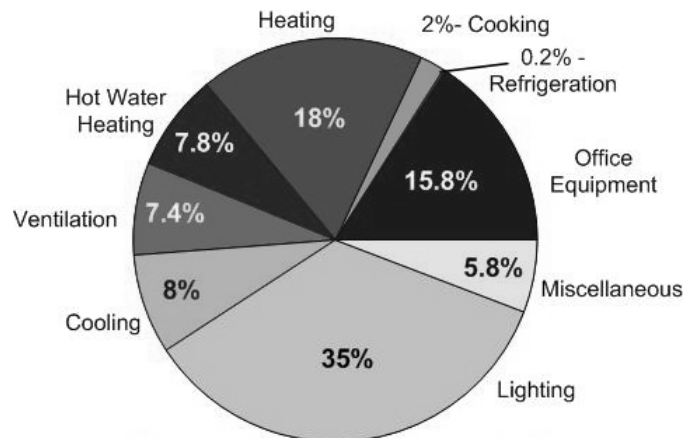
- A 1999 Energy Information Administration (DOE) study documented 730,000 office buildings nationwide, accounting for more than 12 billion square feet of office space.
- While office construction and renovation declined between the late 1990s and 2003, market trends currently illustrate the commercial market and vacancy rates may be stabilizing. Office property sales increased from \$6.5 billion in the first quarter of 2002 to \$7.8 billion in the first quarter of 2003.

Financing and Decision-makers

Commercial office building construction and renovation is carried out largely in the private sector. Existing buildings are managed by private companies, which may own and rent properties in one city, regionally, or nationally.

Energy Use in Office Buildings

(averaged across climate zones)



Source: *Managing Energy Costs in Office Buildings: Energy Consumption Data*. Platts, 2004

Increasingly, real estate is owned by institutions or collective trusts, as opposed to individuals. Decision-making and financial roles include:

Developers (who may or may not be owners)

This group either has located capital or is engaged in finding it. Often, funding is supplied by companies whose mission is to invest in real estate. This group will have top-level decision-making authority and can have a critical say in building design features.

Contractors

This group organizes the architects, engineers and skilled laborers who complete the building.

Building operators and managers

They are critical decision-makers in existing buildings. These are the people who will inspect and report on building systems, and who can identify opportunities for improvement, especially if they have specific training.

Market Trends Potentially Affecting Energy Use

- Numbers of telecommuters and other remote workers will likely continue to increase. This will create new challenges for monitoring commercial energy use, and will create different demands on the grid.
- Workspace layout will change to accommodate employees who are infrequently in the office, including spaces used at different times by multiple people. As a result, office energy use patterns will also change.
- Increasing digitalization of the office environment will create need for office space designs that de-emphasize storage and paper transfer, and emphasize electronic capabilities.

Market Barriers

- Lack of life-cycle costing for energy-saving (and energy-using) capital investments
- Incomplete integration of building systems, including goals, budgets and design
- Lack of incentives for builders and designers to try new technologies
- Lack of technical information; energy efficiency may appear too expensive or complicated
- Triple net rent provisions, where tenants pay for owner operating expenses, create disincentives for energy-efficiency investment

Promotional Strategies

Financial Benefits

Energy-efficient buildings have higher investment returns, higher net operating incomes and higher property asset values.

Adequate, comfortable climate and lighting contribute measurably to tenant retention.

Logistical Benefits

Technological advances make energy-efficiency retrofits easier and more cost-effective than before.

Other Benefits

Improved lighting is proven to make workers more productive and deliver higher performance.

Poor indoor air quality (due to compromised or sub-standard HVAC) leads to problems such as mold growth, excessive heat or cold. This contributes to sick days, low morale and high institutional health care costs.



certification programs, and outreach and education.
www.bcxa.org

EXISTING CONSTRUCTION

Building Operator Certification (BOC)

BOC is a certification program for facilities operations and maintenance staff. Training focuses on maintaining and operating of building systems at peak efficiency.
www.theboc.info

LEED – EB

Developed under the LEED umbrella (see below left), this ranking system addresses building issues, retrofits, and upgrades where “the majority of interior or exterior surfaces remain unchanged.”
www.usgbc.org/LEED/existing/leed_existing.asp

Federal Energy Management Program (FEMP)

While this program is focused primarily on saving energy within the federal government, it offers software tools, publications, videos, and other resources for a wide range of energy managers.
www.eere.energy.gov/femp/about/about.cfm

ENERGY STAR Program

EPA has developed a variety of tools to illustrate the impact of energy savings in existing construction, including the Financial Value Calculator, benchmarking tools and others.
www.energystar.gov/index.cfm?c=tools_resources.bus_energy_management_tools_resources

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PROGRAM RESOURCES

NEW CONSTRUCTION

Leadership in Energy and Environmental Design (LEED) Green Building Rating System®

LEED provides a national performance rating system, developed by members of the United States Green Building Council.

This point system encourages use of many aspects of environmental design. The energy-efficiency section contains the greatest number of potential points.
www.usgbc.org/LEED/publications.asp

Advanced Buildings (New Buildings Institute)

This organization provides a roadmap to achieve a high-performance building. The Benchmark tool “provides designers with the resources to incorporate integrated design strategies ... to reduce energy usage and improve indoor environmental quality.”
www.poweryourdesign.com

Commissioning (Building Commissioning Association)

This professional association provides a number of resources for commissioning, including industry standards,

MARKETING RESOURCES

Building Owners and Managers Association (BOMA)

This is a membership organization with chapters in the U.S. and abroad.

Its mission is to enhance the human, intellectual and physical assets of the commercial real estate industry through advocacy, education, research, standards and information.

www.boma.org

National Assoc. of Industrial and Office Properties (NAIOP)

This is a professional organization with regional chapters throughout the U.S. NAIOP provides members with research, financial and technical resources, training, and legislative updates.

www.naiop.org

International Facility Management Association (IFMA)

IFMA is an international organization with regional chapters in the US. It assists corporate and organizational facility managers in developing strategies to manage human, facility and real estate resources. Members are provided access to research efforts, educational programs and resources, professional certification, a network of chapters and councils, and global professional development events.

www.ifma.org

TECHNICAL RESOURCES

CEE and ENERGY STAR both publish specification lists for various types of commercial equipment.

CEE: www.cee1.org

ENERGY STAR:

www.energystar.gov/index.cfm?fuseaction=find_a_product

Federal Energy Management Program (FEMP)

While this program is focused primarily on saving energy within the federal government, it offers software tools, publications, videos, and other resources for a wide range of energy managers.

www.eere.energy.gov/femp/about/about.cfm

For additional information, references, or text excerpts from this document:

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