Best Practice Guide

Commercial Office Buildings

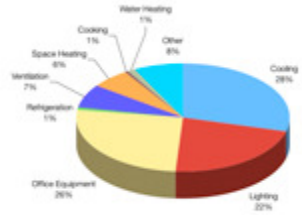
Introduction

Imagine a pot of gold worth $4 billion sitting in plain view. Now imagine that every Californian is able to reach into this pot and grab as much gold as they can - but that hardly any passersby bother to even look at it. The pot sits full, waiting.

Energy efficiency is a lot like this imaginary pot of gold. Potential net financial savings resulting from improved energy efficiency in California businesses and homes is estimated to be as high as $4 billion over the next decade. This does not include corollary financial benefits stemming from energy efficiency, like higher worker productivity, improved asset value for investment and income properties and better, more livable indoor environments.

For the State, investing in energy efficiency programs and enforcing stringent building standards has proven a cost-effective way to help safeguard the reliability of energy resources. About 9,000 megawatts (MW) of energy have been saved over the past 25 years - the equivalent to the output of 18 500MW power plants. State programs and standards have also helped to make California businesses globally competitive, adding three percent to the rate of economic growth, for example, between 1977 and 1995. Energy efficiency creates jobs, new technologies and new industries, while helping to keep the lights on for California's more than 36 million residents.

Office buildings are the single **largest energy user in California's commercial sector** and play a major role in efforts to increase energy efficiency. The buildings sector uses approximately 66% of the electric energy in the United States. Electricity consumption in buildings doubled between 1989 and 2005. If this growth rate is sustained, electricity demand in buildings will increase another 150% by 2030. Consuming roughly 23 million megawatt-hours (MWh) of electricity each year, office buildings account for 28 percent of all commercial energy demand. In total, the commercial sector's electricity consumption represents 35 percent of the state demand, but 38 percent of total peak demand. Peak demand in the commercial sector is dominated by energy for air conditioning (45 percent) and lighting (33 percent). Unnecessarily adding to this are the many properties built before 1975, the year building efficiency standards went into effect. Even in new buildings there remains a huge untapped potential for financial savings through strategic energy management that improves efficiency and reduces costs.



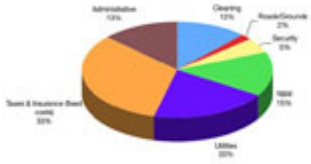
Electricity End-Use Consumption in Commercial Office Buildings by Activity

View Details.

Energy represents as much as 30 percent of a building's operating costs. Now consider this: undertaking energy efficiency measures can reduce energy consumption - and thus, utility bills - by 30 percent or more. These savings add directly to the bottom line. A 30 percent reduction in energy consumption can **lower operating costs by $25,000 per year for every 50,000 square feet** of office space. The best part is that these improvements to energy efficiency can often be attained through no-cost or low-cost projects that also enhance the indoor environment of commercial office buildings.

Besides energy cost savings, thoughtful energy management provides several less tangible financial benefits. An important one has

to do with investor perceptions. Recent studies have **linked energy management to stock market performance**. Investors are discovering that management teams who are successful at grappling with the complexities of energy and environmental management tend to also have the internal capacity needed to safeguard the overall financial health of a company. This relationship can be seen in the recent pressure by investor groups on businesses to disclose environmental and energy performance as part of their annual reporting.



Office Building Expenses

View Details.

Increased asset value is another benefit derived from energy efficiency measures. **For every $1 invested in energy efficiency, asset value increases by an estimated $3**. That means that energy efficiency can be used as a low-risk, high-return investment. Savvy business managers are coming to appreciate that energy efficiency is an excellent means to spur internal growth, especially in income properties where any reduction in operating costs directly translates into an increase in net operating income (NOI). In tight real estate markets where the ability to grow through investments in building or buying may at times be constrained, increasing NOI is a viable alternative. Energy-efficient buildings also help attract the most discerning tenants and buyers, especially in California where energy costs tend to be front-page news.

Finally, most energy efficiency measures also **improve the comfort and attractiveness of the indoor environment**. This is common sense. Lighting retrofits, for example, reduce energy consumption and improve visual acuity. Better vision, in turn, helps workers complete tasks and reduce eyestrain. Likewise, upgrades to heating, ventilating and air conditioning equipment reduce energy costs and improve indoor air quality. At a minimum, this prevents risk of and liability for health problems like sick building syndrome and building-related illnesses. Across the United States, for example, tens of billions of dollars each year could be saved by reducing indoor air pollution.

While occupant comfort is a worthwhile end in and of itself, improving the indoor environment also adds to the bottom line in a number of ways. For income properties, tenant recruitment and retention is positively affected. Building owners can even explore cost-sharing arrangements with existing tenants so that both parties retain the cost savings of energy efficiency. For owner-occupied buildings, a better indoor environment may increase worker performance, resulting in a quicker return on investment. Studies suggest that many energy efficiency measures can boost productivity, reduce absenteeism due to health issues, and help prevent onsite accidents. In some cases, the physical work environment may actually help attract the best and the brightest workers - not surprising since up to **90 percent of our time is spent indoors**. These benefits to worker performance could equal many more billions of dollars of benefits to commercial businesses. Again, it is money up for grabs.

This best practice guide contains tips and tools for improving energy efficiency in existing commercial office buildings. Just as no two buildings are identical, no two owners will undertake the same energy management program. The tools provided illustrate some of the most innovative strategies and technologies as well as some of the most successful case studies. Learning from these stories of success, owners and managers are encouraged to explore the many resources listed throughout the guidebook for more detailed information.

The best actors described throughout this best practice guide were selected because of their accomplishments in improving energy efficiency in existing commercial office buildings. These companies and organizations represent a cross section of commercial building owners. Four are real estate investment trusts (REITs), three of which own or manage properties across the country and are widely recognized as leaders in energy efficiency. The fourth owns and operates about 50 percent of all ENERGY STAR labeled buildings in California. The five other best actors represent owner-occupied facilities, including three corporations with global

operations, a general contractor and a non-governmental organization.

Flex Your Power thanks the following organizations and their employees for sharing their stories in this best practice guide:

- Adobe Systems Incorporated and Cushman & Wakefield.
- Arden Realty and *next>edge.*
- Cypress Semiconductor.
- Equity Office Properties.
- Glenborough Realty Trust.
- Hewlett-Packard Company.
- The Natural Resources Defense Council.
- Qualcomm, Incorporated.
- Swinerton, Incorporated.
- Transwestern Commercial Services.

Flex Your Power thanks the following agencies, organizations, and people for their time and comments:

- California Energy Commission, Consumer Education Center.
- U.S. Environmental Protection Agency (EPA) ENERGY STAR, Commercial Building Program.
- U.S. EPA, Heat Island Reduction Initiative; State and Local Capacity Building Branch; and the Office of Air and Radiation, Office of Atmospheric Programs.
- Alan Pong, Ferreira Service Inc., energy engineering services.
- Jack Rosenthal, P.E., CEM, LEED AP, Glumac, consulting engineers for commercial, healthcare, institutional, and advanced technology sectors.

Flex Your Power is continuously updating this guide, and encourages all comments, questions and submissions of information.

If you have a story that might be suitable for this or other best practice guides, or know of new innovations or building strategies not included, please email us at success@FYPower.org.