

# Bottom Line:

# Energy Efficient Office Buildings

## Make Good Fiscal Sense

By Scott Lenger



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As an industrial or office REALTOR®, your clients are ultimately focused on the bottom line. When appropriate, you can provide added value by assisting them with knowledge about building, buying, selling or leasing high-performance properties. You can do this by showing current or prospective owners that they can make an excellent return on investment, even when a building's operating costs are higher than comparable properties in the area. For buyers, you can illustrate that they can buy a property below market value and invest the savings in energy efficiency. This will be attractive to current and prospective tenants, and it will increase the property's value.

Before signing a lease, tenants evaluate a variety of criteria, including location, lease rates, contract flexibility and amenities. Now more than ever, operating costs play a big role in their decision. For sellers, the proper energy efficiency investments will not only increase a property's value, but will enable them to turn the property much more quickly.

Increasing a property's energy efficiency is more attractive than ever

because going green is starting to provide measurable financial results. As of third quarter 2007<sup>1</sup>, green buildings were netting \$2.65 per square foot per year more than non-green buildings. Green office buildings commanded three percent higher rents, 6.6 percent higher returns and 7.5 percent higher values than non-green<sup>2</sup> buildings. Green buildings also boasted occupancy rates of between 75 and 100 percent for a majority of those responding, and the increase was due directly to green initiatives for 21 percent of the respondents<sup>3</sup>.

Since energy costs are typically the largest line item in an owner or tenant's annual operating budget, (25–30 percent of operating costs in Class A office space), with waste many times averaging 15 percent or more (In a 90–100 million square-foot corporate portfolio, that can mean nearly \$40 million in excess spending.), energy efficiency projects make good business sense.

### **Increase Energy Efficiency to Improve Net Asset Value**

According to the U.S. Department of Energy, U.S. commercial property

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owners spent more than \$107.9 billion on major fuels in 2003. (We know those figures are considerably higher today, but 2003 is the latest year for which these figures are available.) Of that total, heating, ventilation, and air conditioning (HVAC) systems accounted for approximately one-third of the cost.

Given these costs, building owners are more frequently recognizing the many benefits of energy-efficient buildings. The U.S. Green Building Council estimates that an up-front investment of two percent in green design elements will net a 20 percent return on those initial up-front costs over 20 years. These returns are difficult to beat in the current market. It seems clear that reducing a property's energy consumption is most often an excellent investment that creates a competitive advantage for developers, buyers, and sellers. With the right planning, resources, and tools, each of these entities can generate an enticing return on their investment through energy reduction initiatives.

### **Identify Resources**

Once building owners recognize the clear incentives for going green, they need to determine how to assess and improve the efficiency of their buildings. While improving energy efficiency can seem like a daunting process, it is not hard to get started.

As a first step, owners should request input from trusted contractors, engineers, and service providers already working with the building. These people are familiar with the site and are likely to have experience working with facilities sized and outfitted similarly. They can save time and expense evaluating options by suggesting how to make the building more efficient and by presenting products or services they can deliver to reach that goal. The building owner does not need to produce all the information, especially when vendors can help with

identifying options and with evaluating which options make the most financial sense.

Another great option for building owners is approaching energy service companies (ESCOs). They develop, install, and arrange financing for projects that improve energy efficiency and maintenance costs, often guaranteed for up to 20 years.

ESCOs act as project developers and assume the technical and performance risks associated with the project. Ask an ESCO how they provide a comprehensive approach to energy efficiency. What products and services can they offer to make your building more energy efficient? Make sure they have a long-term, established track record and the technical expertise needed to do the job.

### **Determine Potential Savings**

After talking to experts in the field, building owners can use a comprehensive energy audit to demonstrate patterns and levels of current energy use within a building. These will identify opportunities for cost-effective energy reduction strategies with an emphasis on not disturbing building operations.

The ESCO will identify Energy Conservation Measures (ECMs), scope the project, benchmark against industry standards, estimate costs, and determine the financial benefits of the ECMs. A high-level review of possible energy savings should assess local weather conditions, utility rate structures, building occupants' operational requirements, availability of investment capital for system upgrades, and the efficiency and health of the building's existing systems. Given that HVAC systems consume approximately one-third of a typical commercial building's energy use, they are vital systems to include in the assessment.

Energy modeling software can further help to identify opportunities to achieve higher efficiency in both new and old buildings. Energy modeling uses sophisticated algo-

rithms to recreate building systems in a simulated environment. The simulation displays the building's systems and their interactions to show how the building is currently operating and demonstrates how the systems affect energy performance. Advanced modeling tools incorporate up-to-date energy codes and recommendations, (including those from the American Society of Heating, Refrigerating and Air Conditioning Engineers), and include the flexibility to handle data for building systems at varying stages of the building's

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lifecycle. This process provides a powerful resource for making infrastructure changes in a virtual environment and for testing a variety of solutions to determine which combinations would perform the best.

The numbers bear out the value that energy conservation measures can produce. For example, consider a recent energy efficiency project at a 300,000-square-foot office building in a major California metropolitan area. After completing a comprehensive investment grade audit, the building owner and the ESCO decided to focus on a lighting retrofit and a chilled water system upgrade.

The lighting component encompassed changing out all 4,500 of the existing fixtures, ballasts, and lamps to low-wattage with high-efficiency fixtures, ballasts, and lamps, plus the installation of 425 motion sensors to keep lights on only when needed.

- Project cost: \$200,000. The building is eligible for a \$10,000 rebate from the local utility company.
- Projected annual energy savings: \$21,000. Projected annual maintenance savings: \$26,000.
- The simple payback on the lighting project is less than four years with an internal rate of return (IRR) of 33 percent.

A chilled water system upgrade required changing out 20-year-old chillers with new high-efficiency chillers and the installation of variable frequency and optimized chiller plant controls through the building automation system.

- Project cost: \$780,000. The building is eligible for a \$34,000 rebate from the local utility.
- Projected annual energy savings: \$100,000. Projected annual maintenance savings: \$24,000.
- The payback on the chilled water system upgrade project is 5.75 years with an IRR of 16 percent.

The overall project yields a five-year payback and 20 percent IRR—a solid investment in today's environment. With the low-cost financing currently available, the project is cash flow positive every year. The significant savings of such improvements are scalable to large and small buildings alike.

## Best Energy-Saving Options

Going green does not require all-new energy systems. Energy audits and simpler light maintenance can deliver significant earth-friendly energy management to a building and its surrounding community. The biggest potential energy savings come from the areas that create the biggest electrical loads.

The best opportunities for savings can come from review of the systems that must run to create the atmosphere of the office, such as HVAC and lighting, by taking the following steps:

## HVAC Savings Opportunities

- Perform scheduled maintenance. Clean heat transfer surfaces (coils and chiller tubes) to transfer heat efficiently.
- Consider upgrading to a high-efficiency chilled water system.
- For areas with high peak demand rates, evaluate load shifting through ice storage, which cuts energy costs by generating ice at night when energy costs are low due to lower demand. During the day, when power grid usage and electricity costs are the highest, the stored ice is used to provide chilled water for cooling rather than running the chiller plant.
- Inspect and service heating systems. Consider a new high-efficiency hot water boiler.
- Reduce building air penetration and install solar film on windows to reduce heating and cooling load.
- Evaluate the new technologies in heat recovery for your ventilation system.
- Consider adding an automation system with algorithms to optimize the operation of your central plant. This can yield significant savings with a modest investment.

## Lighting Savings Opportunities

- Replace old-style lighting with new technology.
- Install automation systems, such as occupancy sensors, to reduce reliance on employees. This is particularly successful in tenant-based buildings.

Making a building energy efficient does not have to be difficult or expensive. Proactive efforts can produce significant savings in a short timeframe. With a little investigation and planning, building owners can turn their facilities into energy-efficient assets that improve the bottom line. ☺

## Endnotes

1. *CoStar Group, Bethesda, Md., and the University of San Diego's Burnham-Moores Center for Real Estate 2007 study.*
2. *McGraw-Hill Construction, 2006 Smart Report*
3. *2007 national survey of the commercial real estate sector by ALMs Real Estate Media Division, the Building Owners and Managers Association and the US Green Building Council,*

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