



Design solutions lower energy consumption and increase productivity

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People, planet and profit - sustainability's triple bottom line - measures success in "green" architecture. But how do the environmentally conscious among us justify the three-way split to the developers and CEOs traditionally more concerned with front end costs and the single bottom line, profit?

Fortunately, many owners and developers are closer than they realize to going "green," or incorporating sustainable design strategies into their buildings. (A timely change - according to BOMA the commercial office building industry spends almost \$24 billion a year on energy.) Everyday concerns - high utility bills, productivity, sick employees - can be measurably improved with a little sustainable ingenuity.

Some signs you're ready to tackle the sustainable design challenge:

Your employees are Goldilocks with the temperature

Some are cold, others are hot, and no one is ever pleased. Aside from the obvious frustration of constantly adjusting the thermostat, changing temperatures increase energy and cooling costs. Sustainable heating and cooling strategies that rely on physics - radiation and convection - can substantially reduce energy consumption while maximizing comfort.

In addition, providing employees with individual controls for their work areas - through operable windows, local diffusers at floor, desk or overhead levels, or individual radiant panels - can enhance personal comfort while limiting wild fluctuations in total building heating and cooling. Employee education is paramount to avoid abuse, such as setting thermostats too high or leaving windows open during non-working hours which can offset energy savings.

Your office is mistaken for a lighthouse

Last one to leave turns off the lights, right? Doubtful. Artificial lighting usage can be easily reduced by installing occupancy sensors that turn lights off when people aren't present and photo sensors that take advantage of daylight to reduce artificial lighting levels. Swapping incandescent bulbs for compact fluorescents can also save more than \$600 million in annual energy costs.

Harness the power of the sun with light shelves and other appropriately placed reflective surfaces to bounce natural light deeper into the building. Consider use of light-colored materials and surfaces to keep interiors bright, and employ active or passive sun-shading or screening devices to reduce glare.

Sick days are more common than work days

On average Americans spend 90% of their time indoors where pollutant levels may run two to five times higher than outdoor levels according to the U.S. Environmental Protection Agency. Rather than relying on re-circulated air which can spread germs, modern HVAC systems can easily deliver more outside air to occupants.

And it's not just about the air. Evaluation of adhesives, paints, carpets, composite wood products and furniture to make sure they contain low or no VOCs - volatile organic compounds - can prevent employees from being exposed to potentially irritating off-gassing (think "new car smell").

The front door sees more light than your desk

One case study by the Rocky Mountain Institute ("Greening the Building and the Bottom Line") cites how improved indoor environmental quality improved worker productivity by 16 percent. Give careful thought to site selection and the orientation of the building. Consider reusing and incorporating any existing structures and be sure to analyze sun exposures. If nothing else, consider the orientation of the interior spaces to maximize the views and natural light for your employees - and cut down on artificial lighting. Effective daylighting strategies can reduce energy use by 50 to 80%, according to the Sustainable Building Technical Manual (published by the U.S. Green Building Council).

More money is spent on utility bills than new technology

Windows may bring daylight and views but they can wreak havoc on utility bills. High performance glass and glazing systems, such as low-e (low-emission) glass -can reduce heat gain in the summer and heat loss in the winter.

And don't forget about water use: in the US buildings use 15 trillion gallons of water per year, according the USGBC. Water efficiency measures in commercial buildings can reduce water usage by 30 percent or more (reference: USGBC LEED-NC 2.2). In a typical 100,000 s/f office building, low-flow fixtures coupled with sensors and automatic controls can save a minimum of 1 million gallons of water per year (based on 650 building occupants each using an average of 20 gallons per day.) Grey water systems use non-potable water for landscape irrigation, toilet and urinal flushing, custodial purposes and building systems. Utility savings, though dependent on local water costs, can save thousands of dollars per year, resulting in rapid payback on water conservation infrastructure.

What's the benefit? Potential tenants are often willing to pay a premium to rent a space in sustainably designed buildings. Although some sustainable design strategies may entail higher initial costs, they offer owners and developers measurable benefits. And green buildings return on their investment in an average of five years, according to the National Association of Realtors.

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