Bottom-Line Benefits of Green Building for Profitability and the Environment

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Green building is not just a hot trend. The numerous business and environmental benefits of highly efficient buildings ensure that green buildings are the face of the future.

Building owners are becoming increasingly aware of the incentives for going green with new and existing buildings. Energy is the single largest operating expense of a typical commercial building, and energy bills for commercial buildings total about $100 billion per year. Building owners have a major opportunity to save on energy costs by creating high-performance buildings that use less energy and cost less to operate and maintain.

According to the U.S. Department of Energy (DOE), adopting energy-efficient designs and technologies for new office buildings can cut energy costs by as much as 50% and can yield savings of up to 30% in existing buildings by replacing older systems. Furthermore, despite what some building owners may believe, there are not high additional costs associated with green construction. Developments in technology, energy services, and government incentives have made it a very cost-effective way to achieve better building performance, particularly on a life-cycle basis.

In addition to reducing operating costs, energy-efficient buildings increase worker productivity, reduce facility shut-down times, and are more valuable and desirable assets. According to Energy Star, a joint program of the U.S. Environmental Protection Agency and the DOE, every dollar invested in energy efficiency can add up to $3 in building asset value.

High-performance systems can also increase business performance and worker productivity by an average of 5%, according to data from the Institute for Market Transformation to Sustainability. A report by the Rocky Mountain Institute and the U.S. Green Building Council (USGBC) found productivity gains from green design as high as 16%. Green buildings offer better indoor comfort and air-quality control, which lead to lower environmental and health costs associated with air pollution, lessen the risk of sickness, and increase productivity.

Building green also has a significant positive impact on the environment. For example, electricity demand is expected to outpace current capacity in New York by 2012. A major part of that demand comes from buildings, which emit 79% of the global warming gases in the city. By using green building techniques, building owners can reduce their use of natural resources and lower greenhouse gas emissions.

Incentives to make buildings more energy efficient are also offered through various local and state governments, distributed either as rebates or through tax credits or deductions. The Database of State Incentives for Renewables and Efficiency (DSIRE) offers a comprehensive list of state incentive programs as well as rules, regulations, and policies.

The industry benchmark for building green is USGBC's Leadership in Energy and Environmental Design (LEED®). LEED-certified buildings use only 20% to 50% of the energy that typical buildings use and emit 40% fewer carbon emissions. All 50 states now have LEED projects completed or in progress, including several throughout Georgia.

Building owners have several options to increase the efficiency of their buildings. Energy-modeling software is used to assess and improve the efficiency of buildings through a sophisticated software tool that recreates 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. Once the model is complete and verified, you can virtually run the building using the software. This provides a powerful resource for making infrastructure changes in a virtual environment and testing a variety of solutions to determine which would function best in the building.

An energy model recently developed for a Trane financial services client identified a clear benefit to installing a crossover connection between office and data center systems. This application provided energy savings by sharing building-system resources under specified load conditions.

There are several energy-conservation measures that building owners can implement, which range from renewable energy technologies to relatively simple upgrades. The following are some examples of these types of technologies:

- **Ice storage systems:** Generate ice at night when energy costs are low, and the next day, the ice melts, and cool energy is released for air conditioning. Trane recently installed ice storage systems for Credit Suisse in the 1.9 million-square-foot Metropolitan Life Tower in Manhattan, and Credit Suisse now saves $1million or more each year in energy costs as a result of the system. Furthermore, the environmental benefits are equivalent to taking 223 cars off the street or planting 1.9 million acres of trees to absorb electricity usage.

- **Solar photovoltaics:** Devices that use semiconducting materials to convert sunlight directly into electricity.

- **Geothermal systems:** Transfer heat stored in the earth or in groundwater into the building during the winter and transfer it out of the building, back into the ground, during the summer.

The green building industry has experienced phenomenal growth throughout the country. The numerous benefits of high-performance buildings, combined with rising energy costs and government pressure to combat global warming, suggest this growth is likely to continue. Building owners have a tremendous opportunity to help the environment while increasing their financial performance.

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Steve Miclette is the District Manager of Trane Georgia/Alabama. Trane is a division of Ingersoll Rand and is a leading global provider of indoor comfort systems and comprehensive facility solutions, including advanced building controls, and energy-efficient heating, ventilating, and air conditioning (HVAC) systems. Each Trane system is designed to meet the specific needs of customers who want heating, cooling, dehumidifying and air cleaning systems for commercial, institutional and industrial applications. For more information, visit the Trane Web site at www.trane.com.