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Green retrofit of existing buildings pays dividends on multiple fronts

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In light of today's harsh economic reality and oil prices plummeting to less than $40 per barrel, it is easy to forget that oil skyrocketed to $150/bbl only five months ago - a stunning reminder of the energy market's volatility. Increasing energy and fuel costs dragged on the economy, but they also propelled the green energy market. And while many of the driving forces that made energy and resource conservation economically advantageous have faded with declining oil costs, it's only a matter of time before high energy prices return.

Building owners and facility managers should note that because the price of oil is lower than production costs, new exploration projects are being cancelled. Cash rich nations are buying up oil for strategic reserves. Supply is finite. When the economy recovers, oil prices and other energy costs will begin climbing steadily.

Wise owners will take advantage of currently favorable material pricing and low construction costs to undertake green retrofitting of existing facilities. Improving energy and resource efficiency and implementing renewable energy solutions can pay dividends on multiple fronts including: reduced energy costs, increased marketability, and improved employee productivity. Favorable tax treatment, low or no interest loans, and numerous grant programs also make now a good time to consider a green retrofit.

There is a range of technologies that once implemented will result in immediate returns, including:

Improve Lighting Efficiency:Â Replace light fixtures with energy efficient options, replace standard bulbs with compact fluorescent lights or LEDs, and install occupancy sensors.Â New energy efficient fixtures last longer, conserve electricity, and can improve the quality of light.Â Even converting exit signs from the standard 25 watt to one watt fixtures can decrease electricity use and maintenance costs. Using as much daylight as possible reduces electricity consumption for lighting.

Upgrade Bathroom Fixtures:Â Replace existing fixtures with high-efficiency toilets and faucets to reduce water consumption.Â Older fixtures consume up to five gallons of water for each flush.Â New low-flow toilets use 1.5 gallons of water or less per flush, which could result in demonstrable water use savings depending on the fixture count. Utilizing tankless water heaters also eliminates heat loss over long plumbing runs.

Green Roof: Rooftop gardens installed on a waterproof membrane can reduce rainwater runoff and building temperatures, and therefore energy costs.Â Green roofs can also offer an aesthetic atmosphere attractive to building users.Â The most appropriate time to retrofit a green roof on an existing building is when the roof needs repair or replacement.

Geothermal Heating and Cooling:Â In most places, the upper 10 feet of the earth's surface maintains a nearly constant temperature between 50 and 60Â°F.Â Geothermal heat pumps use these relatively constant temperatures to heat and cool buildings by transferring heat from the

ground into cooler buildings in winter and the reverse process in the summer. Heat removed during the summer can be used as energy to heat water.

Solar Photovoltaic (PV): Solar PV technology converts solar light energy to electric energy.Â PV is relatively easy to install on a building and can be readily incorporated into commercial facilities.Â The systems require a flat, open area, such as a roof top, to locate the PV panels.Â PV technology is rapidly evolving and there are many different types of PV systems available for various building configurations.Â

Combined Heat and Power (CHP):Â CHP refers to a system which produces a primary output and utilizes the excess waste energy to produce a secondary benefit.Â A typical primary output is electricity which is used onsite, and the waste heat from the process is used to provide thermal energy for heating and/or cooling as the secondary benefit.Â This can be accomplished using a variety of different processes, fuels, and technologies.Â

Certain green retrofit project costs can be offset by provisions in the Emergency Economic Stabilization Act of 2008, such as the Energy-Efficient Buildings Deduction, which allows taxpayers to deduct the cost of energy-efficient property installed in commercial buildings.Â Â Additionally, the bailout bill included extension of federal renewable energy tax credits and for the first time included tax credits for the use of geothermal heat pumps. At the state level, agencies for renewable energy and the promotion of energy conservation provide funding opportunities for qualified projects.

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