



ENERGY: TAKING A LONG VIEW

LONGER-PAYBACK upgrades can help maximize building efficiency and operational economics

The Clinton Climate Initiative is part of an effort to improve energy efficiency at the Empire State Building. The project aims to reduce the landmark building's energy use up to 38 percent.

BY SUSAN BLOOM

It's a conundrum that many facility managers are familiar with. Energy upgrade projects that can produce long-term benefits for the organization also have payback periods longer than many organizations are willing to accept. The result, in many cases, is that economically sound retrofits don't get funded.

Upgrade projects involving big-ticket technologies — such as boilers and chillers for heating and cooling, window, door and rooftop replacements, and modified ductwork — can require five to 10 years or more to pay themselves back based on their up-front cost and the time and labor required for their installation.

Other energy projects are in the same boat. "Renewable energy sources such as photovoltaics, solar thermal, wind, and geothermal AC systems also carry longer-term paybacks because they're more costly to install than conventional energy sources," says Tammy Fulop, director of energy solutions for Schneider Electric Buildings Business.

While lighting projects often achieve a payback of three years or less, "even lighting retrofits involving highly efficient LED lights can have paybacks beyond five years," says Arah Schuur, director of the Energy Efficiency Build-

ing Retrofit Program within the Clinton Climate Initiative, an organization dedicated to creating and advancing solutions to the core issues driving climate change. However, all of these projects represent some of the most impactful ways to reduce energy use and costs, she says. "They are well worth considering and should not be immediately rejected because of longer paybacks."

The fact is that many organizations do reject upgrades with longer paybacks. That's a shame — and a missed opportunity. "An integrated approach to energy efficiency reduces the building load and saves on the major mechanical equipment side," says Menoj Raathor, director of global energy projects for Johnson Controls.

Fortunately, some organizations are moving in the direction of accepting longer-term paybacks. And industry sources say that there are steps that facility managers can take to make it more likely their organizations will join that trend.

Private Sector Lags Behind

In 2010, the Johnson Controls Institute for Building Efficiency and the International Facility Management Association partnered on the Energy Efficiency Indicator, which surveyed

more than 2,800 executives and managers responsible for facilities budgets and energy use in commercial and institutional buildings around the world. According to that survey, the top three barriers to capturing energy savings were related to dollars:

- Lack of internal capital budget – 29 percent;
- Insufficient payback/ROI – 18 percent;
- Uncertainty of payback/ROI – 18 percent.

According to the survey, the average maximum ROI is 3.4 years.

Experts agree that longer-payback upgrade projects are most often acted on by organizations in the public sector, such as government and municipal entities. "They're not going anywhere and are okay with signing long-term deals," says Chad Nobles, account executive for Siemens Industry, Inc.'s Building Technologies Division.

Longer-payback upgrades are more common in the public sector because state and federal statutes allow for paybacks of 20 years and more if the overall program is cash-flow neutral, says Mike Taylor, vice president for Honeywell's Clinton Climate Initiative work. "That's because there will always be city halls,

THE CLINTON CLIMATE INITIATIVE AND BUILDING RETROFIT PROGRAM

Founded in 2005, the Clinton Climate Initiative, a project of the William J. Clinton Foundation, works with governments and businesses around the world to develop programs that are economically and environmentally sustainable. The group focuses on three strategic areas — reducing emissions in cities, catalyzing the large-scale supply of clean energy, and working to measure and value the carbon absorbed by forests.

The Clinton Climate Initiative's Energy Efficiency Building Retrofit Program brings together some of the world's largest cities, energy service firms and financial institutions to reduce energy consumption in existing buildings. The Clinton Climate Initiative is working on 250 individual and multi-building energy efficiency projects around the world, which represent over 500 million square feet of space. The over 400 building projects that are either in process or completed will prevent the estimated release of over 120,000 metric tons of carbon dioxide into the atmosphere each year.

Working with energy efficiency contractors as well as financial, government, and building partners, the Building Retrofit Program aims to overcome market barriers and develop contracting and procurement models and financial solutions that accelerate the growth of the global building efficiency market. The Clinton Climate Initiative provides pro bono support to building owners such as city governments, commercial organizations, schools, universities, and housing authorities in identifying, designing, and implementing large-scale energy efficiency retrofit projects.

For more information, visit www.clintonfoundation.org/ccli or www.clintonfoundation.org/what-we-do/clinton-climate-initiative/our-approach/cities/building-retrofit.

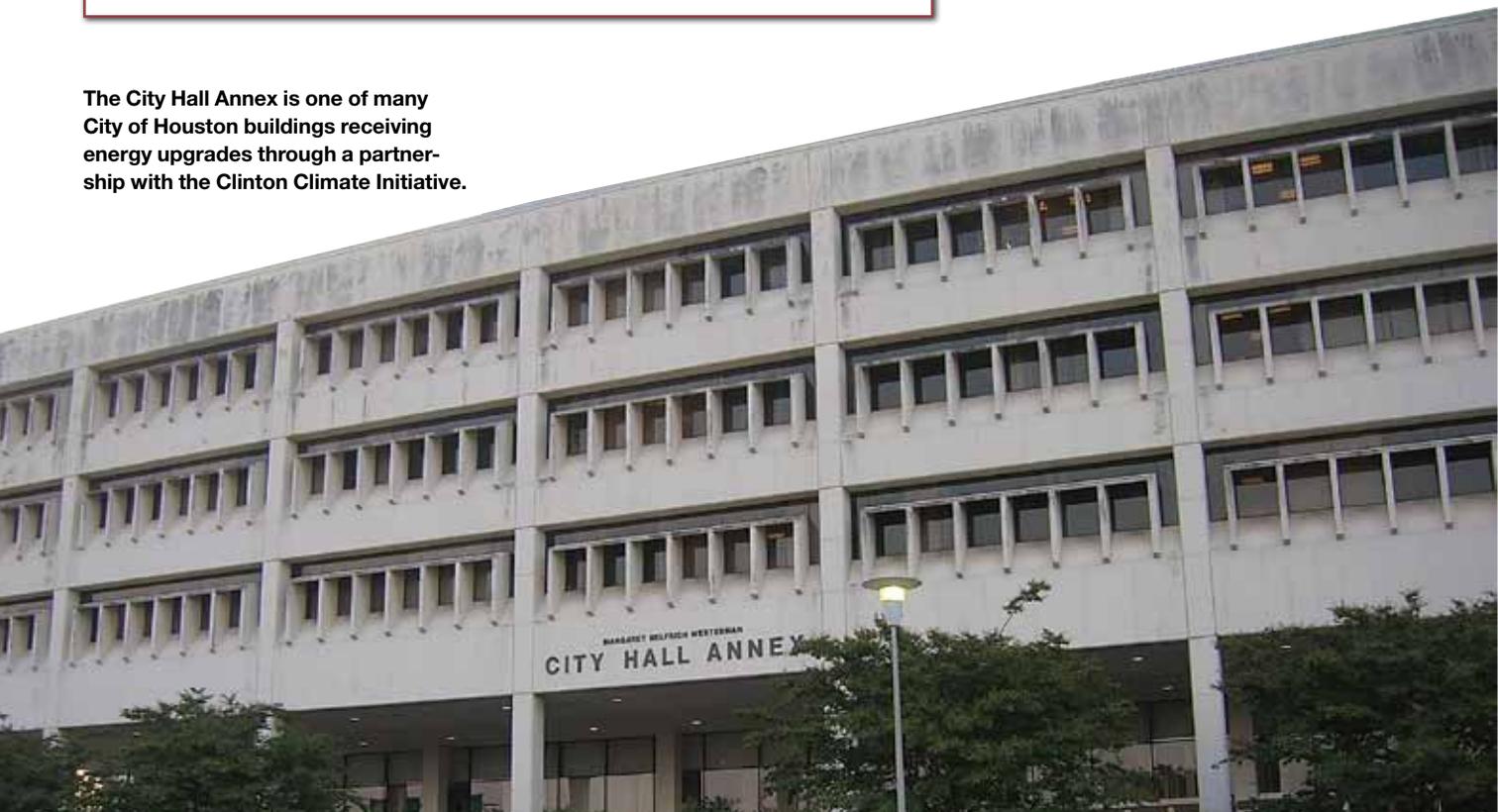
schools, and similar buildings to serve the community," he says.

So why has the private sector, which comprises more than 5 million commercial buildings nationwide, been more adverse to longer-term payback projects, thereby missing out on opportunities to update outdated infrastructure with more energy-efficient technology?

There are many reasons. "Facilities in the commercial and industrial sectors stay in the hands of an owner for a shorter period of time," says Taylor. "As a result, organizations are often unwilling to make long-term investments, especially in buildings that are not core to their business."

Jim Dixon, vice president of energy services for ConEdison Solutions and chairman of the National Association of Energy Services Companies agrees. "Since infrastructure improvements are fixed to the property, businesses which don't own the facilities in which they operate definitely confront the issue of whether the improvements will pay themselves off before the end of the lease period," he says. In addition, he

The City Hall Annex is one of many City of Houston buildings receiving energy upgrades through a partnership with the Clinton Climate Initiative.



SCHNEIDER ELECTRIC

says, "as with most business opportunities revolving around the employment of available funds, the decision to invest in longer-term energy efficiency projects is often balanced against a multitude of other uses of capital. Many times the decision is made based on a faster payback or a greater business need that provides more immediate impact to the bottom line."

Access to capital can be another significant barrier. "Owners don't always have easy access to sources of longer-term financing and may have exhausted their available capital expenditure funds or are precluded from undertaking a larger project that is not deemed to be emergency repair or a critical use of financial resources, despite the potential for reducing costs and increasing revenue," says Schuur.

Making The Case

A short-term focus on energy upgrades has many drawbacks. For one thing, longer-payback projects can play an important role in a building's overall maintenance strategy and economics. "At some point, these

upgrades have to be done, at an ultimate cost to whomever owns the facility at that time," Nobles says. "Typically, if the owner waits to do them at the time of failure, the replacement can be much more expensive initially, and if you figure in the cost of operating that piece of inefficient equipment, it's overall more costly to own." What's more, waiting means higher emissions — an increasingly important issue to many organizations.

In short, "decisions made strictly on up-front financial criteria often disregard the operational needs of buildings and the environmental impact of energy efficiency," says Fulop. She stresses the importance of education around the long-term benefits of upgrades.

There's a better approach than concentrating strictly on payback. "Business leaders need to look at the big picture in their building, taking into account such factors as the energy savings, maintenance and repair costs, expected life of the equipment to be replaced, and impact on the work environment, to develop a true picture

of the overall cost benefit to the facility from the upgrade," says Dixon.

In other words, organizations should pay more attention to costs and benefits over the life of the product and less to simple payback. "Too many times owners are concerned with the initial cost of the equipment and fail to see that the operating costs over its life were much higher than the original purchase price," says Nobles.

That life-cycle cost analysis should examine energy efficiency opportunities holistically to get at the true costs, risks, and benefits of a project, Schuur says. "To do this, incorporate all of the factors that impact the project — not only up-front cost of the replacement and the resulting decreases in utility costs, but operations and maintenance impacts, rebates, incentive and tax advantages, the future possible risks of energy cost increases and carbon taxes, and the impacts of sustainability on the long-term value of the asset," she says. "Changes in compliance and regulations are also critical aspects, as energy

TIPS FOR GOING LONG

Arah Schuur, director of the Clinton Climate Initiative's Energy Efficiency Building Retrofit Program, offers the following tips to help building owners and facility managers navigate the obstacles surrounding long-term paybacks:

- Assess energy efficiency opportunities with a life-cycle cost analysis to present a compelling case to the decision makers in your business.
- Seek out innovative partners in energy efficiency projects — there are many new project developers, providers of capital, utilities, ESCOs, and even government programs (like PACE commercial programs) that are finding new ways to overcome traditional challenges.
- Bundle projects so that those with shorter-term paybacks can support those with longer-term paybacks, bringing down the overall payback period of the project.
- Work with tenants in a collaborative manner. For example, consider incorporating "green lease" language in new leases. In current leases, read the language about expense pass-through carefully and approach tenants early to find a solution to the "split incentive" barrier.
- Work with independent experts, such as the Clinton Climate Initiative, to evaluate any efficiency opportunities and develop structured projects that work for the owner.

London has embarked on a wide-ranging program under the Clinton Climate Initiative to increase energy efficiency with retrofits of buildings, including the 18-story Windsor House office tower.



HONEYWELL

CCI PROJECTS

Through an emphasis on holistic upgrades, companies involved with the Clinton Climate Initiative are helping a broad range of beneficial retrofit projects to materialize.

- Johnson Controls has partnered with the Clinton Climate Initiative to improve New York City's Empire State Building's energy efficiency, with the current \$20 million project aiming to reduce the building's energy use by up to 38 percent, its energy costs by \$4.4 million annually, and its carbon dioxide emissions by 105,000 metric tons over the next 15 years.
- Using a guaranteed performance-based solution, Siemens provided turnkey design, engineering and construction services for a variety of energy efficiency, water conservation and operational improvements in more than 1.3 million square feet of facilities for the City of Houston.
- Through an ongoing partnership with the Clinton Climate Initiative, Schneider Electric recently entered into a \$23 million performance contract with the City of Houston which will implement numerous energy conservation measures in 19 city buildings.
- Honeywell recently launched an energy-savings program in Puerto Rico's Public Buildings Authority headquarters, which will involve energy-efficient measures from lighting to renewable energy technologies such as solar and wind.

benchmarking and disclosure, mandatory auditing, and even compulsory retrofits are becoming more common."

Reaping the Benefits

Industry experts offer several tips to help private sector organizations reap the benefits of longer-payback upgrades while minimizing their risks and boosting returns.

"Bundling long-payback energy efficiency measures with

shorter-payback items such as lighting can make the combined rate of return more competitive against other potential uses of available funding and allows facility managers to leverage projects into more expansive work with greater potential to reduce the facility's energy use," says Dixon.

That approach can significantly increase energy savings. "Quick-payback retrofits may achieve a savings of 15 percent, but by combining them with longer-payback retrofits, savings may be elevated to 30 percent or more," Fulop says.

There's another important benefit to pursuing energy upgrades with longer paybacks. "The overall 'personality' or marketability of the building improves due to the various interactions of the systems," says Raathor.

Other ways to maximize the return on a longer-term payback project? ConEd's Dixon suggests that building owners and facility managers "investigate energy performance contracting, which uses the energy savings of the projects to repay a loan; however, in most instances this also requires the business to have a strong balance sheet or some other form of collateral for the loan. Businesses should also consider tax incentives and government or utility rebate programs as a means of buying more project size, especially where those programs pay for short-payback measures like lighting."

The Winds of Change

Despite traditional resistance in the past, industry sources are encouraged by what they see as an increasing acceptance of longer-term payback projects by today's private sector. "We're seeing a growing appreciation for the economic and environmental impact that more comprehensive programs can have," says Taylor. "For example, we're currently working with several companies that have extended their payback requirements from two or three years to as many as seven years, which is considerable progress."

In addition, "the Property Assessed Clean Energy (PACE) legislation passed in more than 20 states is another step in the right direction," says Taylor. There are still issues to be addressed with PACE — notably lien-holder rights and transferability of tax liens to new building owners — but several organizations are tackling those issues today, including the Clinton Climate Initiative.

Overall, longer-payback projects can address the necessary replacement of critical infrastructure, help maximize a building's efficiency, and benefit the environment. "It's the right thing to do for the life cycle of the building and the equipment," says Raathor. ■

Susan Bloom is a freelance writer who has 20 years of experience in the lighting and electrical products industry. Her specialty is the energy-efficient and green products arena.

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