White Paper

An Awakening in Energy Efficiency: Financing Private Sector Building Retrofits

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An Awakening in Energy Efficiency

A vast opportunity is opening for private-sector energy retrofits as businesses emphasize sustainability and discover new project financing models that deliver strong returns with lower risk.

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Each year, government agencies, schools, universities and hospitals save millions of dollars in fuel and electricity with measures like replacing outdated boilers and chillers, installing high-efficiency lighting, fixing leaky windows and doors, updating building automation systems, and installing renewable energy systems.

A compelling bit of evidence that the private sector has taken notice is a $20 million retrofit of the Empire State Building in New York City, launched in 2009. The work will reduce energy use by up to 38 percent, cut energy costs by $4.4 million per year, and reduce carbon dioxide emissions by 105,000 metric tons over 15 years.

Meanwhile, new financing models have emerged that can make retrofit projects easier to capitalize, less risky for building owners and lenders, and mutually beneficial for building owners and their tenants.

In general, tenants can benefit from lower net operating costs and higher-quality indoor environments, while the owner receives a modernized building that is more attractive and more marketable. Some buildings have seen a three-to-one ratio of increased property value versus dollars invested in energy retrofits. Both parties gain the recognition that goes with creating and occupying greener, more sustainable spaces.

The opportunity for private-building energy retrofits is vast. Market potential in the United States for commercial building retrofits alone is estimated at $18 billion annually for the next 10 years. At the rate of five direct jobs, five indirect jobs, and 10 induced jobs created for every million dollars invested,[1] that translates to 360,000 jobs.

Estimates show that these investments could achieve 22 percent average energy savings across the entire stock of the nation's existing commercial buildings,[2] which consume 18% of the country's energy and produce 18% of the its greenhouse gas emissions.[3] Based on national-average commercial building fuel mixes and electricity emission factors, some 142 million metric tons of carbon dioxide emissions would be avoided – equivalent to the emissions from 31 coal-fired power plants.

Favorable climate

A confluence of trends has helped focus the private sector's attention on efficiency retrofits. First, oil and natural gas price spikes in 2008 renewed concerns about volatility and long-term increases in energy prices. Second, amid concern about global climate change, many businesses now rank sustainability as a critical corporate objective. For example:

- More than half of the Standard & Poors 100 companies now report on their sustainability efforts.

- More than one in five of those companies report on specific sustainability goals and benchmarks.
- Forty-one percent of the Global 500 disclose emissions reduction targets.

In that context, businesses are inclined to measure the value of energy retrofits both for their financial benefits and for their contributions toward sustainability goals.

All this happens as energy efficiency becomes recognized as a first priority in addressing climate change. Energy efficiency has been called the "fifth fuel" – a new source of energy that can be tapped to drive economic growth.

There is broad consensus that the reservoir of energy efficiency is large and can be tapped at low cost. Studies by the Intergovernmental Panel on Climate Change (IPCC) conclude that the potential to reduce emissions through energy efficiency is substantial in several sectors, and especially in the buildings sector.[4]

Energy efficiency is also widely considered the least-cost way of meeting emission reduction targets. "Cost curve" analyses published by a variety of organizations, including the McKinsey Global Institute, Natural Resources Defense Council, and the World Wildlife Fund, suggest that some carbon abatement strategies actually have a "negative cost," or a positive net present value – that is, the savings over the life of the investments more than pay for the initial cost.[5] The majority of these "negative cost" measures are improvements to the efficiency of buildings, vehicles, and factories.

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The capital barrier

Still, until recently, the private sector has been slow to embrace efficiency retrofits in buildings. A wide variety of energy-efficient technologies are available and cost-effective. The question has been how to package and deliver them in ways that stimulate demand.

One of the greatest barriers to improving energy efficiency or adding renewable energy technology in buildings is the high capital cost of projects. Whether upgrading a chiller, installing a solar photovoltaic system, or implementing a bundle of improvements under a whole-building retrofit, clean energy projects require large up-front investments, followed by a long period of payback through savings in energy bills.

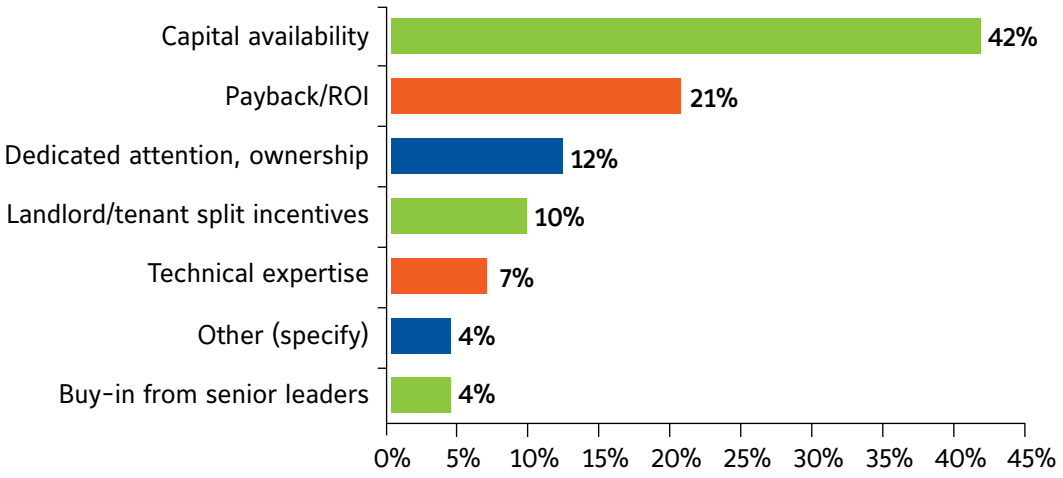
Meanwhile, the typical facilities budget includes a constant operations component with relatively small allocations for capital improvements. Often, the process of getting approval for capital expenditures takes significant time and effort. So, even projects that show an impressive return on investment and net present value may not go forward for lack of capital.

A 2009 survey by Johnson Controls and the International Facility Management Association (IFMA) illustrates the importance of capital as a barrier to energy efficiency projects. When more than 1400 executives with budget responsibility for facilities were asked about the biggest barrier to energy efficiency, 42 percent cited capital availability (see Figure 1). These findings suggest that new financing models can make a huge impact in igniting more clean energy investments.

One highly effective approach to energy-efficiency retrofits is performance contracting.

Figure 1. Barriers to Energy Efficiency Retrofits

What is the top barrier to capturing potential energy savings for your organization?



Source: Johnson Controls and IFMA (2009) "Energy Efficiency Indicator" survey results.

Performance contracting

One highly effective approach to energy-efficiency retrofits is performance contracting. This proven tool has helped the federal and state governments, cities and villages, schools and universities, healthcare organizations, and other entities renovate thousands of buildings, saving vast amounts of electricity and fuel while also reducing other operating costs.

The concept behind performance contracting is simple. Aging equipment and systems are replaced with modern, energy- and resource-efficient technologies, and less-than-optimal operations and maintenance procedures are overhauled with new programs based on industry best practices.

The capital investment to make the improvements is paid for through the savings created over a set period, and the energy service company that installs the improvements contractually guarantees a combination of savings on energy consumption and improved system performance, or both. Usually, the owner's energy and operating costs go down immediately, even while the initial investment is being paid off. At the end of the contract, when the improvements are paid for in full, the owner enjoys substantially lower costs than if the retrofits had not been completed.

For all its success in public and not-for-profit entities, performance contracting has had limited appeal in the private sector, where organizations have different financial priorities, different expectations for return on investment, and different risk profiles. For example, while public and non-profit entities may accept retrofits that pay back the capital investment in five to seven years or longer, private businesses tend to expect payback much sooner – often in two years or less.

On a more basic level, performance contracting projects must compete for capital with other business priorities. Energy-efficiency retrofits typically have lower internal rates of return than investments that drive growth in the core business. They also tend to lack urgency – they can always "wait until next year," especially if energy prices are relatively low and stable and the need for efficiency is not urgent. Therefore, performance contracting gets "stuck in the waiting room" of capital budgeting.

Furthermore, many businesses are concerned about performance contracts affecting their self-imposed debt limits or their debt covenants with lenders. Finally, a substantial amount of private-sector building stock is tenant-occupied commercial real estate. In spaces rented with traditional triple-net leases, owners have had little incentive to undertake performance contracts because the benefits of lower utility costs would go directly to the tenants.

Change in the landscape

The energy price spikes of 2008 helped revitalize interest in efficiency retrofits, and so did growth in sustainability as a corporate priority. Performance contracting became more attractive as a result.

The Empire State Building project, designed in part as a demonstration of improving sustainability in existing buildings, used performance contracting as part of an innovative approach to energy-efficiency retrofits in large buildings.

Empire State Building Company LLC assembled Johnson Controls, Inc. as energy services company, Jones Lang LaSalle as program manager, and the Rocky Mountain Institute as engineering partner and peer reviewer, with advisory support from the Clinton Climate Initiative. In an eight-month design phase, the team identified eight economically viable building improvement measures, including improvements to windows, radiators, building controls, the cooling plant, and electrical and ventilation systems.

Innovations include improved tenant space design and a web-based system to help tenants track and manage their own energy use and hold down their costs. The project, now underway, is on track to meet its key objectives to produce substantial and verifiable energy savings, improve tenant comfort, and make the building more marketable.

Despite this project's promise, the approach cannot be easily replicated across the nation's private-sector building stock. For many businesses, performance contracting as traditionally structured still meets the same obstacles that have held it back for years.

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Innovations in financing

However, new financing models are now emerging that remove major barriers to energy-efficiency retrofits in the commercial sector. In general, these models create incentives for both landlords and tenants, obviate the need for owners to provide capital, and expose financiers to less risk, enabling them to lend more freely and on more favorable terms.

The new models range from variations on performance contracting to performance-based infrastructure programs in which a service company takes full responsibility for the building and its capital and operating budgets under a long-term contract, with built-in performance guarantees, at a single monthly fee. Here is a look at several new financing approaches.

Shared Savings Agreements (SSA) is similar to performance contracting except that the owner benefits from immediate energy savings without making a capital investment and without assuming debt

Anchor Tenant Financing

This performance contracting innovation enables a long-term tenant who occupies all or a large part of a building to benefit from energy retrofits made with the owner's cooperation. The owner works with an energy service company to complete the retrofit and passes the cost to the tenant by way of the lease. The tenant then uses the guaranteed energy savings to offset the higher lease cost and pockets the excess savings.

The tenant reduces its net costs and makes gains toward sustainability goals. Meanwhile, the owner gets a modernization that makes the building greener, more valuable, and more marketable.

Shared Savings Agreements (SSA)

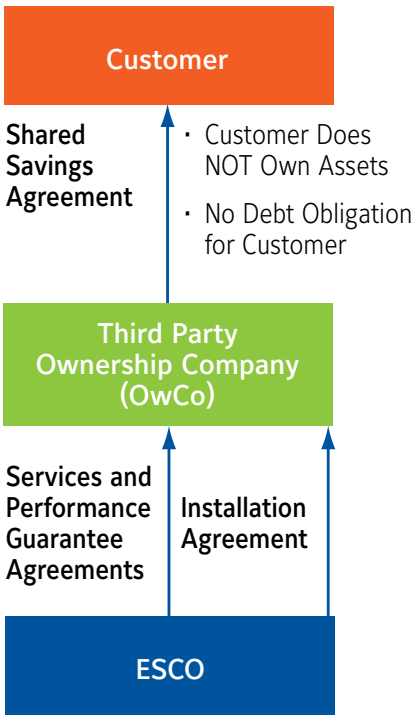
This approach is similar to performance contracting except that the owner benefits from immediate energy savings without making a capital investment and without assuming debt (see Figure 2).

In this arrangement, an energy service company sells a portfolio of building improvements with guaranteed savings, not to the building owner but to a third-party ownership company (OwCo). The building owner receives the energy and operating cost savings, remits a set percentage (usually 80 to 90 percent) back to the OwCo through monthly payments, and retains the balance of the savings.

The energy service company, meanwhile, enters a performance agreement to operate and maintain the improvements to ensure that the guaranteed savings are realized.

The SSA typically lasts 10 to 12 years, after which the building owner takes ownership of the improvements and retains all resulting savings.

Figure 2. Shared Savings Transaction Dynamics



Description

- ESCO sells OwCo a portfolio of facilities improvement measures which are self-funding from savings in energy and other operational costs.
- OwCo provides beneficial use of FIMS to Customer, which remits 80% to 90% of savings back to OwCo on a monthly basis.
- Typical term is 10-12 years.

Benefits to Customer

- Improved Environmental Stewardship
- Improved Facilities Performance
- Improved Financial Performance
  - Potentially Off Balance Sheet
  - Potentially Off Credit
  - Always Accretive to Earnings

SSAs are more complex in structure than performance contracts in that they involve the third-party OwCo. They also require a legal and accounting review, which can lengthen the time from idea to execution. In particular, SSAs usually must be structured to comply with accounting requirements for classification as a services agreement (instead of a lease). Finally, the owner's share of savings may be smaller than the savings generated in a performance contract undertaken directly with an energy service company.

An SSA helped Tulane University, a private institution in New Orleans, make major efficiency retrofits to its campus as part of the build-back from Hurricane Katrina. The SSA model was appropriate because storm damage left the university in a financial crisis and unable to assume new debt.

The project will use $2.35 million in guaranteed annual utility savings to offset $17 million in renewal projects under a 12-year contract. The improvements, which include a 4,500-ton central chiller plant expansion, campus-wide water conservation upgrades, lighting retrofits, steam system improvements, and energy management system upgrades, covered 53 buildings totaling nearly 2.8 million square feet.

Carbon dioxide emissions are expected to be reduced by an estimated 119,300 tons per year, equal to the yearly emissions from 23,400 cars.

Capital lease

Under a capital lease, the energy-efficient equipment is treated as capital equipment, owned by the project financier and leased to the building owner. At the end of the contract, the equipment ownership transfers to the building owner. Until then, while the equipment appears as a capital asset on the balance sheet and requires the building owner to account for depreciation, the arrangement provides tax advantages that lead to rates lower than market averages.

Power Purchase Agreements (PPA)

Power purchase agreements provide another way for businesses to improve energy efficiency, or receive green energy, with no up-front cost.

In the most common form of PPA, a company allows a third party to install photovoltaic panels on its building or property and agrees to purchase the resulting energy at a specified price for an agreed-upon term, typically 15 to 20 years. In this scenario, the company may pay more than the basic market price for the energy in the name of going green and meeting sustainability goals.

In another PPA application, a company hires an energy service company to install a high-efficiency central heating and cooling plant and agrees to buy the chilled and heated water. Here, the energy savings over an old, inefficient plant may be substantial.

In either case, the business gets a known benefit from the installation without investing capital and taking on debt.

Property-Assessed Clean Energy (PACE) Bonds

PACE bonds (also called tax lien financing) represent a new and potentially powerful financing mechanism that could break down special barriers to energy-efficiency retrofits in commercial real estate.

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While owners of commercial buildings appreciate the value of energy retrofits, they are often unable to finance the investments because the properties are owned by unrated, limited-liability "shell" entities, are fully pledged under a mortgage and potentially a mezzanine investment, subordinate third-party interests to existing creditors, and disallow third-party liens on real property attachments, such as heating, ventilation and air conditioning equipment. Taken together, these impediments leave prospective retrofit lenders with little or no security in projects they might otherwise finance.[6]

Proponents believe PACE bonds, along with federal loan guarantees, could dramatically accelerate the energy retrofitting of the nation's building stock. They estimate that the potential for PACE bonds could exceed $500 billion.[7]

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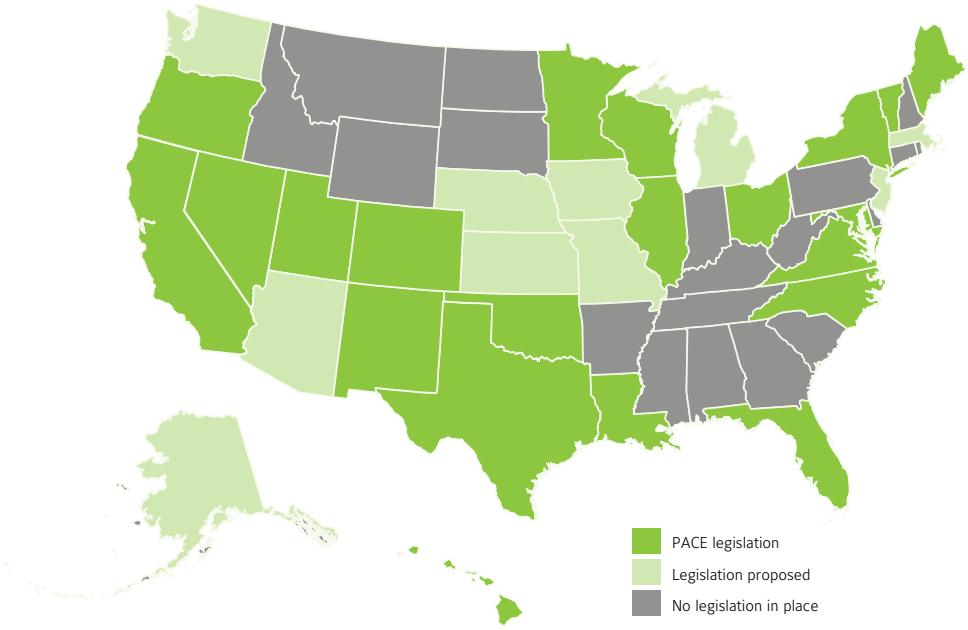
Using PACE bonds, owners borrow from a newly established municipal financing district created exclusively for energy-efficiency retrofits and small renewable energy projects. They repay the money over a 20-year term through a special assessment on the property tax bill.

This approach makes retrofits more affordable because it spreads the cost over a longer time span. It also helps reduce borrowing costs because the tax lien gives lenders the security they require. The tax lien is senior even to mortgage debt, and even if building ownership changes (which often happens every four to six years in commercial buildings) the tax lien remains in place. This security makes lenders more willing to underwrite retrofit projects, and to lend at favorable interest rates.

PACE bonds become possible through a series of steps:

- A state passes enabling legislation that allows for special municipal taxing districts.
- Municipalities in that state (city or county) creates special PACE districts
- The PACE district issues a PACE master bond.
- Real estate owners apply for PACE funds to install energy efficiency measures and renewable energy systems, such as solar energy.

Despite its relative complexity, the concept is advancing rapidly. As of mid-April 2010, local governments have the ability to launch PACE programs in twenty-one states, and ten additional states have enabling legislation pending.



Endorsers of PACE enabling legislation include municipalities, environmental and sustainability advocacy groups, real estate associations, energy service companies, state energy commissions, and energy equipment manufacturers and associations.

One of the nation's first PACE programs is in the City of Berkeley, Calif. Called Berkeley FIRST, it is a solar financing program that enables property owners to borrow money from a Sustainable Energy Financing District to install solar photovoltaic systems. The city states that Berkeley FIRST helps remove many financial hurdles facing property owners who want to install solar systems.[8]

Green leases

A common barrier to energy efficiency is mismatched incentives between parties, as where a building owner is responsible for making building improvement decisions and a tenant pays the energy bill. A result of this mismatch is that the energy efficiency of commercial real estate tends to be dismal. There is a huge opportunity for cost-effective energy efficiency projects in these buildings if the incentives can be properly aligned.

One approach is a new structure called "green leases." These leases, under development by trailblazing owners and property management firms, motivate tenants to conserve energy and water, produce less waste, and choose environmentally friendly products, furnishings and office equipment. They often include provisions to ensure that tenants comply with the building's green practices. Three key elements of a green lease enable energy efficiency projects:

Triple-net lease. Unlike a gross lease, a triple-net lease requires the tenant to pay all taxes, insurance, maintenance, and utility expenses on top of monthly rent. This gives the tenant incentive to make energy efficiency a priority when making improvements, because the tenant directly recovers any investments in efficiency over the lease term.

Sub-metering. By sub-metering energy and water delivered to individual tenants, building owners can bill for actual usage and peak demand. This practice, combined with a triple net lease structure, motivates tenants to conserve. It also allows the owner to use a fee/rebate incentive system to right-size electrical and mechanical systems.

Capital cost pass-through. Under a green lease, owners have the right to pass on to tenants the cost of capital improvements that lower total operating costs. The tenants, who pay the utility bills, then benefit from energy savings as a return on investment. The lease should ensure that pass-through costs include the costs of maintaining, managing, commissioning and re-commissioning the building to conform to a green certification or rating program.

A collaborative green leasing process creates a win-win, helping tenants by lowering total operating costs, and helping owners by improving building marketability and reducing vacancy risk.

On-bill financing

On-bill financing is another tool to help building owners pay for energy efficiency improvements without burdensome capital outlays. These programs are offered by the electricity and or natural gas utilities. The utility fronts the cost of the improvements and recoups it over time by incorporating loan repayment into future energy bills.

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Performance-Based Infrastructure

A holistic approach to major building retrofits, Performance-Based Infrastructure, shifts full responsibility for building operations and all financial and operating risk to an energy service company for a term of up to 30 years.

First applied to new building projects, the concept originated in Australia as a way for public entities to benefit from private firms' expertise in construction and operations. In that context, the approach has been known as **public-private partnership or "P3"**.

The fundamental idea behind performance-based infrastructure is that risk should be borne by the parties best able to manage it. In this instance, the construction and operation of buildings falls outside the core competency of most businesses: those that undertake major projects on their own risk delays and cost overruns during construction and excessive costs for energy and operations once the building is complete.

In a performance-based infrastructure approach, an energy service company manages construction, operations and maintenance and is fully responsible for the operations and capital budgets. This party is entrusted to make decisions at every stage that consider the optimum energy efficiency, life-cycle cost, and occupant comfort.

Under the 30-year agreement, the energy service company issues performance guarantees. The owner pays a single, predictable monthly fee over the life of the contract.

Performance-based infrastructure has been utilized for government building projects in Canada and California, and the concept can apply equally well to private-sector projects.

A performance-based infrastructure program enabled Bridgepoint Hospital, in Toronto, Ontario, to replace its existing facility with a more environmentally friendly one. Under a contract worth an estimated $182.9 million over 30 years, the hospital will receive a full scope of facilities management and life-cycle improvements, including all mechanical and electrical systems. In addition, the new hospital will receive a building automation system, fire and security systems, and HVAC equipment.

Opportunity waiting

Seldom if ever have so many conditions aligned in favor of energy-efficiency retrofits for private-sector buildings. The rewards have increased with the rising cost of energy and with the value placed on initiatives that address sustainability. Innovative financing methods now make it easier for businesses to complete retrofits in ways compatible with their financial models and business strategies.

A large and lasting opportunity exists for building-improvement projects that cut energy consumption, create jobs, and significantly reduce greenhouse gas emissions.

About the author

Peter White is the director of Commercial Energy Solutions at Johnson Controls, Inc. Peter has 27 years of experience in Performance Contracting for new construction and existing buildings, culminating in over 100 Performance Contracts.

He began his career in a technical sales position and was promoted to Branch and Sales Management roles. He began serving the public sector vertical market exclusively in 1985. He took on a national role within Johnson Controls to manage the public sector business for Johnson Controls in Canada and the Western United States. In his current role, he manages a team that is focused on contracting with commercial building owners for energy conservation projects.

He has received Johnson Controls' Chairmen's Award for Innovation in the area of Energy Conservation. He was on a committee to jointly develop the BOMA Performance Contract Template. He has held several seminars on Performance Contracting, and participated as a guest speaker at Utah Energy Summit, IDEA, Real Com, ASHRAE, School Business Official Association, BOMA, School Board Association Conference, Oklahoma Municipal League and many of his projects have been featured at US Green Building Conference, National Association of County Officials, and National League of Cities. He has participated in the development of legislation for Energy Conservation Performance Contracting programs that have led to increasing local work for employees and contractors.

Resources

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