# Financing Energy Savings Retrofits through Internal Corporate ESCOs

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## ABSTRACT

Several companies that are recognized as leaders in developing and implementing best practices for reducing the energy intensity of their operations utilize strategies that emulate the energy services company (ESCO) business model. The traditional ESCO model relies on performance contracting, by which the service provider identifies energy efficiency projects, provides financing, and shares the resulting savings with the client company. This business model can help to overcome several market failures or barriers to investment in energy efficiency. Many industrial and large commercial companies that are motivated to invest in energy efficiency have sufficient internal technical and financial resources to implement projects independent of an ESCO contractor. Yet internal barriers often remain that impede implementation of cost-effective projects. An "internal corporate ESCO" approach can help to overcome these barriers.

Based on four case studies of energy management best practices, this paper identifies elements of an internal corporate ESCO model. Features of this approach include deployment of internal engineering teams to provide technical expertise throughout the organization, piloting of demonstration projects and sharing of best practices, establishment of a capital fund earmarked for energy efficiency projects, development of procedures for tracking savings, and sharing of savings between the corporate (utility or operations budget) and facility or department levels.

The model presented here can serve as the starting point for additional empirical study.

## Why Internal Corporate ESCOs?

Several major industrial and commercial firms are implementing a strategy that makes capital and technical expertise for energy efficiency investments available to their full portfolio of facilities. At the core of this strategy are policies that make capital available for energy projects, and creation of a core team at the corporate level that serves as a technical resource for facility-level management. In many ways, this approach borrows from the energy services company (ESCO) business model that emerged in the United States in the 1970s and showed strong growth in the early 1990s.

ESCOs are energy services companies distinguished by their fundamental reliance on the performance contracting model that incorporates concepts of "shared savings" or "guaranteed savings" (Goldman, 2005). The fees paid under a performance contract fluctuate based on energy performance targets, and energy savings are monitored or they may simply be forecasted based on engineering and operational assumptions. In contrast, under a fee-for-services or fixed-price contract an engineering firm is paid a negotiated fee to install energy efficient equipment in a building or plant. ESCOs may include or even emphasize turnkey contracting and energy management consulting in their business model, however this article focuses on the performance-based models.

ESCOs can provide a valuable service by helping companies to overcome some hurdles to investing in energy efficiency. Even when companies decide that they should deliberately manage energy costs and make investments to control energy usage, it is often challenging to implement a robust and successful energy management strategy and investment plan. They may recognize the value of investing in energy efficiency but frequently don't venture beyond projects with payback terms of one or two years.

A rich academic literature explores the question of the "efficiency gap," or why firms apparently under-invest in cost-effective energy efficiency measures (Kulakowski, 1999; Golove and Eto, 1996). The possible explanations for an efficiency gap range from market imperfections to institutional culture, structure, and decision-making, and also individual choices and attitudes. Arguments based on market failures include concepts such as the consumer's lack of information on energy efficiency opportunities and the challenges of procuring efficient technologies. Institutional factors, such as how firms evaluate risk in capital investment decisions or how information flows within an organization, can impede cost-effective investment in energy efficiency. At any level of a firm's hierarchy, individuals may perceive energy as an uncontrollable cost or view energy efficiency as an unworthy investment.

The purpose of this paper is not to resolve the controversies over whether or why an efficiency gap exists, but to highlight a promising strategy that can help to overcome what many analysts, policy makers, and energy managers agree are barriers to energy efficient investments within corporations. The ESCO value proposition can be viewed as designed to overcome many of the obstacles identified in the "efficiency gap" literature, such as:

- **Imperfect information.** Decision-makers may not know how to recognize energy efficiency opportunities, what technologies would improve efficiency, or how to measure savings. The time and money required to obtain that information is a transaction cost. ESCOs provide expertise to identify and implement projects, and track results.
- **Risk of first adopter.** This is both a form of imperfect information and a transaction cost. Once an energy efficiency project is successfully demonstrated at one site, the risk of investment at other sites is reduced. An ESCO's portfolio of completed work demonstrates the value of energy efficiency projects.
- **Capital scarcity and rationing.** Companies generally prefer to invest in growing their core business—building new factories or adding production lines—rather than in cost-cutting measures. While understandable, this may mean energy efficiency projects that promise a high rate of return are overlooked. ESCOs make capital available for energy efficiency projects.
- **Split incentives.** This primarily refers to leased space where occupants have incentive to reduce their energy bills but are not inclined to make retrofit investments that are not shared by the owner, or do not have the authority to act without the owner's consent. However, in any firm, accounting procedures may also obscure incentives to save energy at the facility or department level. ESCOs can help to illuminate the benefits of investing in efficiency projects, although split incentives still present a challenge to ESCOs.

ESCOs can help companies to overcome these barriers, particularly in terms of technical expertise to implement energy efficiency projects, access to capital, and the ability to recognize energy savings.

## Problems with the ESCO Model

By the late 1990s, the market for performance contracts was declining in the US, including in the institutional sector (Goldman, 2005). While the institutional sector (such as schools and local governments) has been a fertile market for the ESCO model, private commercial and industrial companies have tended to be skeptical, with many concluding that they don't require the assistance of ESCOs. The reputation of performance contracting plummeted in the private sector with the collapse of Enron, which had featured performance contracting prominently in its Enron Energy Services business (Joyce, 2003).

Perhaps Enron can be blamed for some decline in the popularity of performance contracting. But companies have recognized problems with this investment vehicle, at least in practice if not in theory. One problem that can arise in a shared-savings contract is that, in an effort to protect their interests and limit risk, the ESCO and client each take a defensive stance when the time comes to calculate energy savings and apportion earnings and losses. Apart from creating an inherently confrontational relationship, this arrangement encourages painstaking and expensive monitoring and verification (M&V) procedures. M&V can range from low-cost to high-cost methods, such as: engineering estimates of project-level savings, facility-level targets based on whole building or process-level energy use, or sub-metered data with statistical analysis of trends and comparison against baseline. Some degree of M&V is extremely valuable and it is an important service that ESCOs provide for complex projects. However, excessive attention to M&V can become a costly administrative burden.

Another problem is that the ESCO industry in the US is shifting away from a risk-sharing model. The original performance contracting business model was designed so that the client and contractor share in project investment risk on the downside as well as the upside, with the intent that both will profit from the arrangement. In this sense, the companies are more partners than service vendor and client (Garforth 2007). Increasingly, ESCOs in the US are emphasizing guaranteed-savings contracts over risk sharing, and most performance contracts estimate energy savings conservatively (Goldman 2005). These trends represent an evolution toward more of a traditional fee-for-service contract, so that the customer essentially pays for project management plus capital and financing costs. By conservatively estimating energy savings in a shared savings contract, risk sharing may be replaced by an opaque interest rate paid by the client. In other words, what is essentially a finance charge is disguised as risk sharing. Additionally, by moving away from the risk-sharing concept, ESCOs are focusing more on low-value and low-risk projects.

This stripped-down form of the performance contract is less appealing to large industrial companies when they consider that they can acquire project management and financing at cheaper rates rather than negotiate a complicated shared savings or performance guarantee contract. In fact, some companies have demonstrated that they have sufficient internal project management and financial resources to take on the role of the ESCO contractor themselves.

## Elements of an Internal Corporate ESCO

The internal corporate ESCO approach adopts many of the beneficial aspects of ESCOs and performance contracting, while reducing some of the risks and costs associated with transferring project management and financing outside of the company. As with external ESCO contracts, an internal corporate ESCO can be designed to overcome many market failures and barriers to investment in energy efficiency (Figure 1). An internal corporate ESCO may include some or all of these elements:

- Internal engineering teams are deployed across the facility portfolio for opportunity identification and project management.
- Demonstration projects are piloted and replicated at multiple facilities.
- Internal capital financing is made available from funds earmarked for energy efficiency projects.
- A standardized process is developed for monitoring and verification of project savings.
- Savings are shared between the corporate (utility or operations budget) and facility or department level via credits or decentralized departmental or activity-based accounting.

For companies that have the funds and expertise available to implement energy efficiency projects, but where the organizational structure and decision-making processes impede such investments, an internal ESCO approach can be more cost effective to implement than hiring an external vendor that may charge a higher interest rate, claim a profit margin on top of financing costs, and introduce additional administrative burdens.

**Figure 1: Efficiency Gap Challenges and Internal Corporate ESCO Solutions**

| Barrier or Market Failure | Challenges - Why Companies Under-invest in Energy Efficiency | Solutions - Internal Corporate ESCO Strategies |
|---|---|---|
| Imperfect information, transaction costs | Decision-makers lack familiarity with energy efficiency technologies and savings opportunities. | Internal engineering teams are deployed across the facility portfolio for opportunity identification and project management. |
| Risk of first adopter | Decision-makers view energy efficiency projects as high-risk investments (or effectively assign a high risk premium or discount rate to efficiency investments). | Demonstration projects are piloted and replicated at multiple facilities. |
| Capital scarcity and rationing | Capital is not available for energy efficiency projects as it is allocated toward production and market growth goals. | Internal capital financing is made available from funds earmarked for energy efficiency projects. |
| Imperfect information, transaction costs | Energy savings are not recognized. | A standardized process is developed for monitoring and verification of project savings. |
| Split incentives | Those who would benefit from energy savings do not have sufficient incentive to take action. | Savings are shared between the corporation (utility or operations budget) and facility or department level. |

## Examples of Internal Corporate ESCOs

After Enron declared bankruptcy and its $2.4 energy services deal with Owens Corning was nullified, Owens Corning decided to continue the program on its own, effectively creating what may have been the first "internal ESCO" (Garforth 2005). The company established a separate capital expense budget specifically for energy-related projects (Dannhauser and Palochko, 2004). To help select projects to fund, Owens Corning built up a database of successful capital projects and savings achieved, starting with a 15-plant pilot program. Even before Enron's dramatic collapse, however, at least one other major US corporation was experimenting with adopting internally the tools-of-the-trade developed and marketed by traditional ESCOs. Beginning in late 2000, Frito-Lay has implemented several elements of an internal corporate ESCO. Other companies are also benefiting from ESCO concepts without signing a shared-savings contract with an external provider.

The following case studies summarize observations from published articles and interviews; they are snapshots of internal corporate ESCO activities at a given point in time. In each case, the company's activities may have evolved beyond the descriptions presented in this article. This underscores opportunities for future research, which include identifying other companies that are taking similar steps, and also further elaborating on these case studies, tracking their progress, and comparing results.

**Frito-Lay**

Frito-Lay, Inc. is a leading food manufacturer with over 30 manufacturing sites in the U.S. Before deciding to develop an independent energy management and investment strategy, Frito-Lay explored the concept of the traditional ESCO model by investigating dozens of ESCO firms and nearly negotiating a deal with one. Instead, Frito-Lay embarked on a path of selectively adopting elements of the ESCO approach to implement internally. The resulting energy management strategy enabled Frito-Lay to reduce its annual fuel consumption 21 percent and electricity use 18 percent, compared against the company's 1999 baseline (Frito-Lay, 2007).

As a first step, Frito-Lay established a corporate-level energy department encompassing purchasing, operations, and engineering to handle both the supply (procurement) and demand (retrofits and operations) side of the energy cost equation. The Energy & Utilities Group set energy savings goals similar to—but more aggressive than—what had been proposed by outside service contractors. They figured that even if they do not identify as many retrofit projects as an outside ESCO could, they wouldn't have to pay management fees or share energy savings.

In fact, the new program produced savings not only in excess of what the ESCOs had proposed, but the actual savings were far above Frito-Lay's own stretch goals. In the first two years of the program (2001 and 2002), actual energy savings exceeded the ESCO-proposed targets by 9 and 8 percent, respectively. This was possible in part because Frito-Lay also uncovered savings from operational and behavioral measures, and much of those "windfall" savings would likely have been split with an external ESCO partner, had such a deal been inked. The company's net gain in savings compared with an external arrangement may also be due to operational efficiencies in managing the program. In the words of Rob Schasel, Frito-Lay's senior manager of energy and utilities, "Because our energy program is self-driven, there are no off-limits areas, no contract disputes, and no questions about employee participation" (Joyce 2003).

Each year, the Energy & Utilities Group is able to assess progress and convincingly demonstrate a high rate of return (exceeding 30 percent) thanks to simple yet reliable reporting systems. The process begins with target setting. A team of auditors, including a Division Resource Conservation Captain, corporate support, and site champions, descends upon each facility to identify and prioritize opportunities. Resource conservation targets are set for each facility, based in part on capital project plans. Facility scorecards are used to track actual energy performance against targets on a weekly basis. Results for individual projects are also tracked in a "project execution matrix" (Russell, 2005).

**Lockheed Martin**

Lockheed Martin is an advanced technology company specializing in aeronautics design and manufacturing, and electronic, information, and space systems with 939 facilities in the US.

Recognizing that capital projects for energy efficiency were regularly overlooked in favor of production and growth-related investments, Lockheed's corporate energy manager lobbied internally for the creation of an annual capital fund specifically set aside for efficiency projects (E SOURCE 2002). Beginning with a pilot fund in 2002, the corporation has since set aside $6 million to $8 million each year for energy efficiency projects. Facility managers within Lockheed Martin's various business units compete for access to the funds by submitting project proposals to the corporation's department for energy, environment, safety and health. For FY 2007 the fund has been increased to over $10 million to accommodate a special investment project that may portend the future direction of this program (Raj, 2007).

Setting aside capital funds specifically for energy efficiency projects has dramatically increased the implementation of cost-effective improvements throughout the company. Prior to this program, many facilities had project proposals that languished unfunded despite their high rates of return because they could not successfully compete in the company's annual capital budgeting process.

Lockheed's criteria for choosing energy projects include economics, geographic distribution, and non-energy benefits. Non-energy benefits relate to a project's positive impact on productivity, environmental performance, employee safety and health, and overall facility modernization. (However, funds from the energy capital program cannot be used for nondiscretionary projects that are designed to primarily meet production or growth goals, or environmental, safety and health mandates.) Funding decisions are generally based on the internal rate of return generated by the proposed capital investment and the resulting operational cost savings. Consideration is currently limited to projects with an estimated simple economic payback of four years or less. However, a sufficient number of projects have been available with even shorter payback periods, so must projects funded to date produce returns after 2-3 years.

The facilities do not keep shared savings from the projects. In part this is because the energy budget is managed at the corporate level and is embedded in the overall operating cost at the facility level. Although a project application must include a description of how the resulting savings will be measured and verified, the corporate finance structure is set up to track just the first year return. This is sufficiently effective for short-payback projects. Each project is evaluated individually rather than as a bundle or package of projects.

For FY 2007 the program is funded at over $10 million to accommodate a $5 million biomass facility in addition to the more traditional energy efficiency projects. Even that project—a scrap wood and sawdust plant to be constructed at a Lockheed facility in New York—is anticipated to show a return on investment in four years. The biomass facility will be evaluated as a test case for funding additional innovative projects in the future. Out of 52 proposals submitted for 2007, only 10 did not win funding. The winning projects range from lighting, hot water systems, and pumps, to controls and metering.

**Roche Palo Alto**

Roche Palo Alto (Roche PA) is a pharmaceuticals research and development company owned by Swiss healthcare company Roche. At Roche PA in California, the utilities operation manager had the expertise and motivation to identify and implement extensive retrofits and operational management for energy savings. But in the early 1990s three barriers were in the way: access to capital, the ability to monitor performance to find opportunities and track success, and lack of consensus from building occupants who were wary that altering building systems would be risky for sensitive laboratory equipment, projects, and materials (E SOURCE 2004).

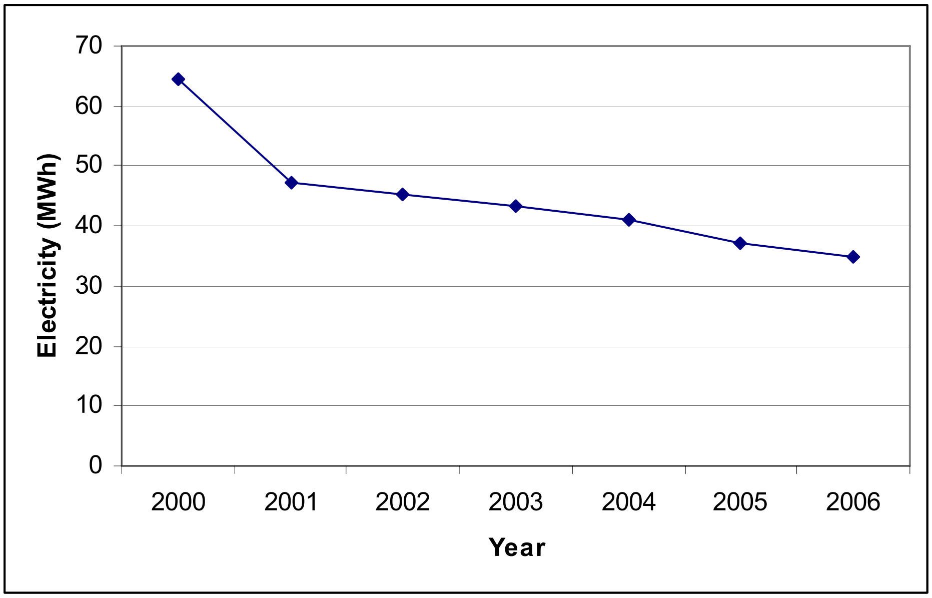
The first two challenges were overcome beginning in 1994, when Roche PA invested some $250,000 into a robust submetering system, including individual building meters and temporary meters on some equipment. The company's utilities operation manager, Jerry Meek, made a deal with Roche corporate management that he would reduce annual energy consumption by 5 percent for several years, but only if he were given this basic tool: building- and system-level energy data. Initially considered a cost that would not be recovered, the meter installations did turn out to have a payback. Using the new data, Meek and his staff were able to identify and implement enough no-cost HVAC energy conservation adjustments to cover the cost of the meters in just three years. Armed with a regular flow of consumption data, Roche PA's operations staff is able to work through a continuously updated to-do list of conservation projects, prioritized and categorized by season, return on investment, and whether they can be accomplished in-house. Although there is no earmarked fund, energy efficiency projects can take priority in annual capital allocations for the campus. Since 1999, Roche PA's savings from conservation amount to 40 percent for electricity and 41 percent for natural gas (see Figure 2 and Figure 3).

The third problem—lack of enthusiasm from laboratory staff—was gradually overcome with the assistance of the submetering system. The Palo Alto campus comprises just over one million square feet of space in 17 buildings that house mostly pharmaceutical research and development laboratories. Meek's approach to getting buy-in from building occupants is to pass the savings from capital projects on to them, freeing up funds for other purposes. Relying on the meters installed across the campus, Roche PA's operations department bills building occupants by volume of consumption for electricity, natural gas, and chilled and hot water. Because occupants of each building are directly responsible for paying for their consumption, they are happy to work with the operations department to trim their bills.

To start off on good terms with building occupants as he embarked on conservation projects, Meek first looked for opportunities to excise waste in central plant operations. That way, if he could reduce costs by installing a more efficient chilled water system serving multiple buildings, for example, he could bill everyone a little less for chilled water. There was no negative impact on building occupants: They can use the same amount of resources, but are billed at a lower rate. The company is able to keep costs down by having in-house staff do most of the work. Not only does this approach save money, but the operations staff also develops in-depth knowledge of how to maintain the systems.

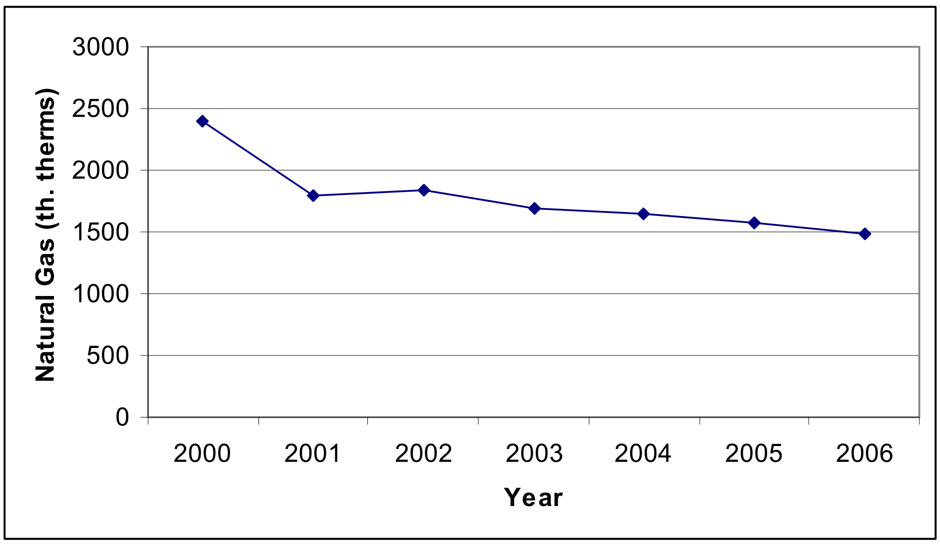
By setting a good track record of improvements to central systems, and passing those savings on to his internal customers without asking anything in return, Meek established an excellent foundation for implementing building-specific changes that occupants may perceive as inconvenient. His department was then able to negotiate adjustments such as temperature setpoints, humidity levels, and air changes per hour in individual buildings, and ultimately larger capital projects. Many capital and operational projects could not have been implemented without buy-in from the user communities in these various buildings. It was shared savings that earned that buy-in.

**Figure 2: Electricity Savings at Roche PA Facilities (2000-2006)**




Source: Meek, 2007

**Figure 3: Natural Gas Savings at Roche PA Facilities (2000-2006)**




Source: Meek, 2007

## Hines

Hines is a privately owned real estate firm active in property investment, development, and management worldwide. Its portfolio includes more than 950 properties representing over 380 million square feet of office, mixed-use, and industrial space; hotels; and many other property types. Hines takes a relatively long-term view of its energy management strategy, which is apparent in its capital investment and retrofit decisions.

At Hines, responsibility for energy management is decentralized to the regional and facility level across the company (E SOURCE 2006). Each building engineer has daily, monthly, and annual responsibilities that directly impact the energy performance of the facilities. Rather than a single corporate energy manager, essentially, all of Hines' building operations staff are energy managers because the corporate culture recognizes that their actions have direct impact on how energy is utilized at a property.

The corporation manages its assets as if it might own a property indefinitely, because anything that improves the asset will provide returns even when the building is sold. In practice, this means the corporation is ready and willing to fund capital projects that promise a return in five years or less from energy savings. Additionally, when Hines constructs a new building or retrofits an acquired property, the standard procurement specifications include premium-efficiency motors and chillers, and variable-frequency drives. Instead of an earmarked capital fund, procedures are in place to regularly assess energy efficiency opportunities at each property.

The company's building engineers still encounter impediments to cost-effective retrofits of leased spaces, however. Split incentives remain the main hurdle. Hines is implementing internal ESCO solutions to overcome this barrier.

In some markets, Hines' buildings are extensively submetered so that operating expenses and savings can be passed through to tenants accurately. This creates an opportunity for the corporation to function not only as a landlord but also as a performance contractor to its tenants. (Although Hines does not currently formally refer to the practice described here as a form of performance contracting, the company is actively seeking designation as a performance contractor in the New York City market in its dealings with the New York State Energy Research and Development Authority.) The typical lease structure at Hines properties also supports this approach. In many buildings, all operating expenses are passed through directly to the tenants, so anything Hines can do to lower those costs provides a direct benefit to tenants. When retrofits are implemented, the costs as well as the savings are apportioned to all affected tenants so that they don't pay extra during the payback period and after that reap pure savings.

In recent years, it has become more commonplace for Hines' tenants to inquire about how they can act in concert with their landlord to lower their operating expenses. To the extent that a project serves only their space, the tenant would be asked to share in the expense in one of two ways. A tenant may choose to pay the up-front costs of a retrofit to their space, or partner with Hines to repay the cost through their monthly lease payments. As an example of the former option, Hines helped a tenant install a heat exchanger to cool their data centers. Hines provided the technical expertise and project management, while the tenant funded the capital cost. The tenant recoups the investment through lower energy bills. In another example, a tenant interested in revamping their lighting system for energy savings could bear the cost over time through their lease payment, and reap the savings at the end of the payback period.

If retrofits impact the central building systems, then that cost would be dispersed over all occupants of the building, apportioned to the tenants over time based on the amount of space they occupy, as are the savings. During the payback period the cost and the savings balance out, so the tenants stay whole over the payback period after which they reap all of the savings. If a tenant decides to leave at some point during the payback period, they've lost nothing.

Three corporate project and performance tracking systems serve as simplified measurement and verification tools for Hines. These are: the company's own Hines Utility Monitoring and Management Tool (HUMMT), ENERGY STAR's Portfolio Manager online software for benchmarking, and spreadsheets to log and calculate projected savings from capital projects and operational measures.

HUMMT is used to capture monthly energy bills. Spreadsheet formulas construct a five-year moving average of energy performance for each building that can be checked monthly.

Building engineers also regularly enter bill data into Portfolio Manager to track the building's score over time. Regional and central managers annually compare ENERGY STAR (Portfolio Manager) scores across the corporate asset portfolio. And finally, detailed tracking of both capital and operational measures is accomplished in spreadsheets with standardized formulas for expected energy savings. Building engineers can compare their expected savings to actual performance documented in both HUMMT and Portfolio Manager. While this is not as precise as a full monitoring and verification procedure for each project, it keeps M&V costs down and is sufficiently reliable.

Building engineers at Hines also share best practices for retrofit projects and operations through a corporate Best Practices program. This helps to lower the cost of duplicating projects at many sites. Building operators submit best practice descriptions in a template. The submissions are reviewed, polished, and published in an online database for all in the corporation to utilize.

## Summary

Each of the case studies reviewed here feature a team of technical experts available to assist individual facilities to identify, assess, and implement energy efficiency projects (Figure 4). They each also use demonstration or pilot projects to reduce the risk of the unknown for sites that have not yet implemented similar projects. (Note that the results summarized in Figure 4 are based on the author's interpretations of information in published cased studies and from personal communications cited for this article.)

**Figure 4: Internal Corporate ESCO Case Study Summary**

| Company | Observation Year | Internal Engineering Teams | Demonstration Projects | Earmarked Capital Fund | Monitoring and Verification Process | Internal Shared Savings |
|---|---|---|---|---|---|---|
| **Frito-Lay** | 2003, 2005 | X | X | X | X | |
| **Lockheed Martin** | 2002, 2007 | X | X | X | | |
| **Roche Palo Alto** | 2004, 2007 | X | X | | X | X |
| **Hines** | 2006, 2007 | X | X | | X | X |

The other aspects of internal corporate ESCOs are not universally observed in the case studies. An earmarked capital fund for energy efficiency fills a need where corporate culture or policies put energy efficiency investments at a disadvantage. Additionally, an earmarked capital fund is useful if M&V is lacking and internal shared-savings is not possible.

The definition of M&V used in these case studies is very broad. Under a shared-savings performance contract with an external ESCO, risk is often managed via a rigorous and precise M&V protocol. Relaxing this requirement under the internal corporate ESCO approach saves time and money. The negative aspect of the simpler approach is that all actual savings are not tracked. Improving the M&V of internal corporate ESCOs could open the way for larger, riskier projects as well as more sharing of savings with departments and facilities.

Shared savings across facilities and departments within an organization is uncommon because accounting procedures typically do not accommodate it. For shared savings to work, either the facility or department must pay for its own use of energy, and be able to retain the savings from each billing cycle, or savings must be tracked with M&V and later distributed.

Often an operating unit of a corporation is tasked with reducing energy costs, but does not truly share in the savings. If successful, the corporate energy manager may be rewarded with a bigger pool of capital funds for next year's projects. But if the operational unit or occupants of a facility where improvements were made do not have the ability to deploy a portion of those savings within their operational unit, they will have less of an incentive to buy into the idea of energy efficiency investments. This is relevant to industrial facilities where many energy efficiency projects have ongoing operational requirements, and the persistence of savings from capital investments depends on operational procedures.

## Room for Evolution

This article presents a model for a corporate energy efficiency strategy that would benefit from further study and elaboration. There are several paths to take to continue this research, such as identifying additional case studies, surveying corporations, and comparing energy performance results.

Companies continue to experiment with and elaborate on these internal ESCO techniques and more examples are appearing. One possible new entrant in this experiment was seeking top corporate approval for the concept as this paper was written. Most of this company's facilities are owned and operated by partner firms, while the corporation operates an internal bank that is primarily used to fund equipment purchases to help expand markets. The financing arm, jointly with corporate energy management staff, can function as a low-cost energy performance contractor to its partner facilities.

What is the endgame? Will internal corporate ESCOs replace the need for external ESCOs among industrial corporations? External ESCOs should remain relevant for the largest, riskiest projects. This is because even for corporations that enable shared savings across departments and facilities, the risk is still retained within the organization. It is also possible for companies to evolve beyond the need for an internal corporate ESCO. A firm that adopts a culture such that energy efficiency projects are evaluated on an equal footing with other investments, and that retains sufficient technical expertise at the facility level, may have evolved beyond the need for an internal corporate ESCO strategy.

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