

# Understanding ESCOs and Facility Needs Equals Success

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By James Piper, P.E. - November 2012 - [Energy Efficiency](#)

Energy service companies (ESCOs) offer institutional and commercial facilities a means of reducing their energy costs through energy-saving retrofits and the installation of energy-efficient equipment. In spite of ESCOs' potential and advertised benefits, maintenance and engineering managers should not rush into an agreement with an ESCO without first fully understanding the way the process should work.

Most buildings, even those that are relatively new, offer many opportunities for projects that can reduce energy use. For managers to make the most of the opportunities ESCOs provide while achieving cost-effective energy savings, they must understand the savings they can achieve by undertaking all suitable projects for their facilities. Only then can they effectively select the most appropriate projects based on their needs and their goals.

## Understanding Goals

One of the most important steps in the entire process is the identification of the program's goals. The first step is to examine in detail the organization's goals in working with an ESCO:

- Are rising energy costs putting a squeeze on the energy budget?
- Have changes occurred in the way the facility is billed for energy that will result in significant increases in energy costs, even though energy use might remain constant?
- Has energy use in the facility risen to the point that costly upgrades are required as a result of limitations on capacity?
- Does the facility need to replace HVAC components due to equipment age and simply be sure that replacement equipment is the highest efficiency possible?

Each of these goal is common for energy programs, but each requires a different approach. For example, if the goal is to reduce electrical demand, the program should focus on such tasks as peak-load reductions and load-time shifting. Improving the operating efficiency of HVAC units in this case might reduce energy use but might not have a significant impact on electrical demand.

Without understanding the organization's goals, it is difficult to map out an effective energy-conservation plan to achieve the goals. The result is apt to be wasted time, effort and money.

# ESCOs: Success Starts with Identifying Energy-Efficiency Targets

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Once managers have identified the organization's goals, the next step is to identify the most cost-effective way to achieve them. In most cases, this means working closely with the ESCO to identify potential projects that would generate the desired energy savings or load reductions. The most comprehensive way of identifying these projects is through an energy audit.

An energy audit is a detailed survey of the facility that reviews how and where the facilities use energy and determines where the potential exists for energy savings. For each potential project, the energy auditor develops a preliminary estimate of the project's cost and cost savings.

Typical energy audits have four targets: lighting systems, HVAC systems, building controls, and building envelopes. The audit must examine all of them to be effective.

Lighting systems offer some of the most cost-effective energy conservation measures. The most common lighting-system measures involve upgrading to more efficient light sources, reducing light levels to match the requirements of the space, or installing automated controls that limit the operation of the lighting system to those times when occupants actually need light.

When looking to improve the operating efficiency of HVAC systems, managers must evaluate a range of options, such as replacing existing components with higher- efficiency units, closely matching system capacities to needs, performing neglected maintenance, or balancing air and water systems so they provide optimal levels of heating and cooling.

Improperly operating building-control systems are a major source of energy waste in facilities, and they can significantly reduce equipment service lives. Energy audits frequently identify sensors that are out of calibration, poorly or incorrectly operating control sequences, inappropriate system set points, and equipment operating schedules that fail to match space use requirements.

Finally, the audit will identify areas on the building's envelope that need more insulation, new door and window seals, upgraded glazings, and shading devices to reduce solar thermal loads.

These are the most common targets of energy audits, but it is important that the audit go beyond these items. For example, audit should consider the energy and cost benefits of on-site generation of electricity from conventional or renewable sources, particularly for facilities looking to reduce their peak electrical demand.

## ESCOs: Success Requires Careful Selection of Energy-Efficiency Projects

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When the energy audit is complete, the ESCO will present a list of projects, along with their estimated implementation costs and projected energy savings, that are appropriate for the facility and will help it achieve its goals.

Some of these projects will require additional efforts, such as the development of an engineering design. Those additional costs must be included in the project's cost estimate.

It is important that managers work with the ESCO to rank the projects for implementation. A project's rank should incorporate a number of factors, including implementation costs, how well the project matches the facility's goals, how implementation will affect facility operations, and how well the maintenance and engineering department will be able to support the project once it is completed.

It is also important to consider the structure of the contract with the ESCO because it will impact overall project costs, risks and benefits. While there are a number of ways contracts are established with ESCOs, the three most common types of contracts are shared savings, guaranteed savings, and no guaranteed savings.

Under a shared savings contract, the ESCO provides the funding and conducts the energy audit. Energy cost savings are calculated by an agreed-upon method and are shared between the ESCO and the facility.

A guaranteed savings contract sets an guaranteed level of energy savings that a particular project will achieve, typically at a level exceeding the project's cost. The facility is responsible for project financing.

Under a no guarantee contract, the ESCO conducts the energy audit, completes the project design, and manages construction and commissioning. The facility finances the project and assumes the financial risk associated with the energy savings, as there is no guarantee. The facility also reaps all financial benefits of the project.

Long-term maintenance needs are important when evaluating potential energy conservation projects. To meet their performance guarantee for energy savings, ESCOs often require a maintenance contract on the components installed over the life of the ESCO contract.

Eventually, however, maintenance of the components installed will become a manager's responsibility. Before committing to complex projects that require a high level of technical expertise or maintenance, managers must make sure their departments will be able to properly operate and maintain the components.

Working with an ESCO can be very beneficial, but managers must be actively involved in the process to ensure the maximum return on the investment.