An Introduction to the Energy Services Industry

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ABSTRACT

In the late 1970s, a small company in Texas was marketing one of the many devices that had been developed as a response to the decade's dramatic rise in energy costs. In essence, the device automated the task of turning lights and similar equipment on and off at appropriate times to save energy—a time clock. The concept was simple; the savings were compelling. In spite of the obvious savings, marketing the device was difficult because many simply doubted that the savings would actually be realized. As an innovative approach to selling the device, the president of the company began to make a different kind of offer to prospective customers. Instead of asking them to pay for the time clock up front, he asked instead that they simply give him a percentage of the measured savings achieved. Suddenly, sales accelerated and, the company that had had difficulty selling the device for $1,000 had no trouble at all persuading people to commit to pay cash amounts which were worth five times that much.

Such was one of the early experiences in the energy performance contracting or energy services (ESCO) industry in the United States. Time Energy went on to achieve rapid and spectacular growth, but like many young companies in an emerging field, declined almost as precipitously shortly after going public.

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The ESCO industry has grown slowly and in fits and starts since the late 1970s. Early entrants were small entrepreneurial companies, either small independent companies or small divisions of large energy companies. Today the industry has grown to approximately $2.5 billion per year and seems to have reached a critical size, as more and more electric utilities and other energy giants are joining the field.

WHAT ARE ENERGY SERVICES?

Traditional Products and Services

A defining characteristic of an energy service company (ESCO) is that it will accept payment for energy projects installed based on the performance of those projects. Traditionally, the amount paid to an ESCO has been a percentage of the energy saved by the project. However, payment may also be indexed on any number of acceptable measures of performance.

The energy services industry's traditional focus has been the delivery of comprehensive turnkey energy efficiency services, including identifying, developing, designing, constructing, owning, financing, maintaining, and monitoring energy efficiency projects.

Project Identification and Development

What an ESCO does best is identifying projects for customers and advising them as to the best opportunities to reduce energy-related costs. In a first phase, a senior auditor usually conducts, at no cost to the customer, a brief inspection of the customer's facility to identify likely projects and the magnitude of opportunities to reduce electricity and other energy costs.

Based on the hypothesis that these projects can be developed at the scale contemplated, an ESCO will ask the customer to proceed to a second phase to confirm the opportunities identified during the first phase. In making this request, the ESCO usually warrants that a project of a pre-defined, acceptable type and magnitude can be developed and that otherwise, the customer will bear no liability for costs incurred.

Engineering Design

For many simple technologies, e.g., lighting retrofits, a feasibility study is sufficient to define the project in enough detail for the ESCO to

commit to construct the project at a firm fixed price. Often, however, the feasibility study is followed by an engineering and design phase to define the project at a drawings level and present firm cost estimates. When electing to proceed with a feasibility study or an engineering and design phase, the customer agrees to pay the associated costs if a project of the contemplated type and magnitude identified is confirmed but the customer elects to stop the project after that phase. If, upon detailed analysis, no project can be identified of the type and magnitude represented, the customer usually bears no liability for costs incurred.

ESCOs generally only use energy-related equipment readily available and having a reasonable track record. Most common technologies for commercial application include efficient lighting, heating, air conditioning, ventilation, energy management control, motors, cogeneration, back-up generation, building shell measures, power factor correction, energy efficient industrial equipment and controls, and other proven energy end-use applications.

Construction

In the construction phase, the ESCO assures its customer that the project will be implemented on time and on budget. ESCOs generally implement projects as specialized design-build contractors, providing overall project management, including commissioning. Much of the work is outsourced to local sub-contractors who may have specialized knowledge of the customer's operational needs and practices and who have knowledge of local requirements, such as building codes.

Monitoring and Maintenance

ESCOs usually warrant that the savings they project will actually be realized. They are typically three options available to the customer: a) the customer may simply elect to have no warranty other than the standard equipment warranties. This is often true of sophisticated industrial customers who are convinced that the savings will occur and are unwilling to pay a premium for a savings guarantee; b) under the second option, the ESCO will warrant the initial operation of the project, i.e., it will demonstrate that the project is delivering the projected savings during a test period immediately after the project has been completed; c) the most expensive option, but the least risky for the customer, is to have the ESCO warrant the savings for to the term over which a project is financed.

Typically, a customer is obligated under a contract to provide O&M services on the equipment installed or to contract with the ESCO to have the equipment maintained. Many customers, such as large industrial firms who already have maintenance staff in place perform the maintenance themselves. In such cases, ESCOs nevertheless prescribe how equipment is to be maintained and operated, lest their savings guarantee be amended or voided. Many facility managers do not have budgets that include funding for maintenance of equipment installed by ESCOs. For these customers, a long-term contract for maintenance, paid out of the savings generated by a project, is a very attractive option.

Project Financing

The ability to provide project financing is a major service that is critical to ESCOs' success. For the most part, ESCOs select among the different financial products available on the market today and adapt them for use in a performance contract application. The type of financing offered depends on whether or not the customer wants an obligation off his balance sheet, on who is at risk for project performance, and on whether the payment obligation is linked to a specific project.

New Products and Services

As deregulation unravels utilities' old exclusive service areas, ESCOs are being acquired by gas and electric utilities and other large firms positioning themselves as national firms offering "one-stop" energy shopping services to energy users. As a result, services traditionally out of the ESCO mold are now being offered. This includes information services which enable customers to better use their facilities and better negotiate energy purchases; billing services to help customers reduce administrative and energy costs; energy purchasing services for procuring fuel and electricity; power quality services; outsourcing services to enable customers to reduce costs by concentrating on their core business; and literally any services which is related to energy and solves a customer's problems.

Unique Features of Energy Services

The are three features which above all others, characterize the ESCO industry: the integration or "bundling" of services, the provision of long-term performance warranties, and the investment of capital in projects.

Integration or "Bundling" of Services

Traditional ESCO services—project identification, development, implementation, financing, and monitoring—are usually provided as a single, integrated service. This integration reduces administrative burden for customers, accelerates the implementation of projects because of an ESCO's design-build approach, and helps ensure that projects are as comprehensive as possible, often melding long payback projects with short pay back projects into one cost-effective project. This last point is important as a customer's piecemeal approach to projects based on available internal capital often results in less savings and a less comprehensive project. Often, this makes it impossible for remaining projects to meet a customer's investment hurdle rate on their own; as a result, they are never implemented.

Long-term Warranties

ESCOs are paid based on the performance of their projects. If the projects perform well, ESCOs are paid much more than when they perform poorly. The long-term performance warranties offered by ESCO distinguishes the industry from other firms specializing in energy efficiency improvements who are typically paid for their services whether or not projects achieve the anticipated results.

Investment

Typically, an ESCO provides the capital required to develop a project for a customer. More importantly, ESCOs not only provide investment capital, but they will generally invest in many projects that a customer would otherwise reject. Customers frequently have difficulty raising capital dollars for energy cost reduction projects. These projects usually compete unsuccessfully with market or production enhancing investments for a limited amount of capital dollars. In addition, the bureaucratic procedures for securing capital dollars can be very cumbersome with some firms. Moreover, budget allocation for energy cost reduction projects has a very low priority and often does not survive mid-year reallocation to more pressing projects (a leaky roof, for example). ESCOs who provide financing that can be self-supported by lower operating costs hence provide a valuable service to their customers. The required annual return on capital for a large commercial or industrial customer's investment in projects not related to core-business is often 30 percent or more. In fact, required paybacks of one year or less, that is,

annual returns of 100 percent are not uncommon. These projects are simply not seen as a material source of cash flow. ESCOs, by contrast, invest funds at much lower discount rates. The reasons are straightforward: First, an ESCO's core business is investment in energy related projects. Second, ESCOs have a better understanding than customers of the risks incurred in their projects and of the risk mitigation measures they can use, as a result of experience in implementing similar projects in different facilities and with different owners. The result is that ESCOs generally will invest in projects which customers reject, and in doing so, ESCOs make savings available to customers that are often otherwise unavailable. This phenomenon is a natural outcome of capital rationing which is at the core of successful capitalism. It is illustrated in Figure 1.

BUYERS AND THEIR BEHAVIOR

Historical Barriers for ESCOs

Credibility

Not that many years ago, there were few ESCOs offering energy services and many customers were very reluctant to use their services.

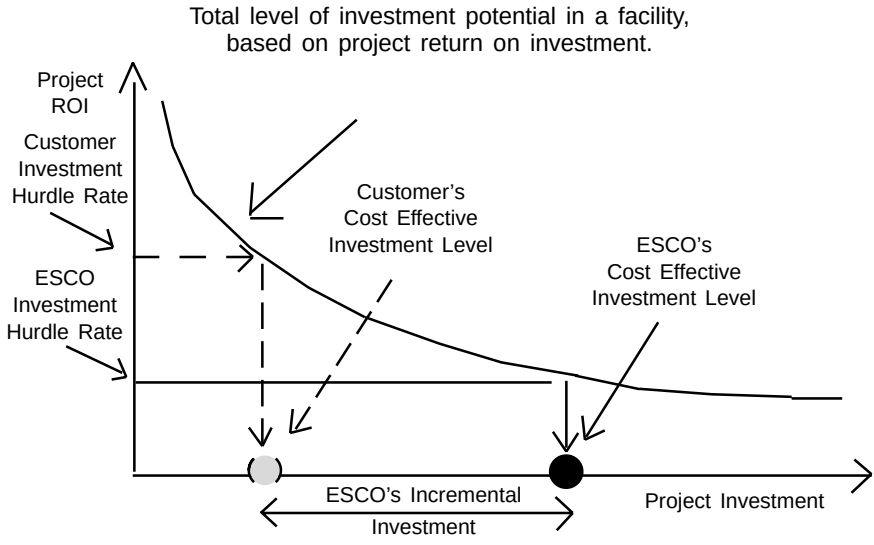


Figure 1. Investment Value Provided by ESCOs.

One principal reason for this is that the contemplated business relationship was generally characterized by a small company (the ESCO), dealing with a very large company. Many prospective customers were skeptical that ESCOs had the resources to deliver on the promises being made. As the industry matured, several developments have made customers more eager to use ESCO services today. For one, utility demand side management (DSM) programs have given the market the opportunity to become more familiar with the ESCO industry. Also, many utilities have directly entered the ESCO market. Their involvement brings perceived legitimacy to ESCO services as their brand name recognition provides comfort to prospective customers.

Contract Terms and Conditions

The nature of ESCO services requires a long-term—usually between 5 and 10 years—contractual relationship between an ESCO and customers. Most companies are reluctant to enter into long-term contracts and have complex internal processes to approve long-term obligations. Moreover, early ESCO deals were very complex contractually and ESCOs have historically had difficulty in getting customers agree with the terms and conditions of a performance-based contract. This was especially true when dealing with customers insisting on using their own purchasing documentation. Initially, patience and education were key to resolving this issue. ESCOs have also learned during the intervening years to deliver their services with less complex contracts. Unfortunately, one of the industry's failed efforts over the last 5 years is the attempt to increase the legitimacy of the business by developing model contracts, for fear of "teaching" proprietary tricks of the trade to competitors. The reality is that customers want to feel comfortable with the contracts they sign and take comfort in knowing that other customers have reviewed them before. Their position is fairly simple: since model contracts such as AIA forms can be used in the construction industry, why not in performance contracting? Quite possibly, customers' efforts such as the latest DOE model contract and the requirement by main stream financing entities—who have recently discovered the industry—to see more uniformity in contracts are signs of things to come.

Procurement Processes

The typical sales cycle for an energy services project is usually between 12 and 18 months. Indeed, the purchase cycle for energy ser-

vices by customers is typically annual and the early identification of potential projects when a window of opportunity opens up within that cycle is essential to quickly move to a contractual relationship. What has historically been most frustrating for ESCOs, however, is the complexity of certain customers' procurement processes, in view of the risk-free, performance-based approach championed by the industry.

Federal agencies, for example, have been able to avail themselves of performance contracts for almost one decade. Because of the complex requirements of the Federal Acquisition Regulations (FAR), this did little to stimulate the performance contracting industry, even though the Federal Government uses over $6 billion of energy annually. The passage of the Energy Policy Act of 1992 was forecast to quickly enhance the energy efficiency of Federal Agencies through the infusion of private capital in the form of performance contracts. Because of the complexity of Federal procurement processes, only now, some 8 years after the passage of that bill, and uncounted efforts by the Department of Energy's Federal Energy Management Program and the ESCO industry, are those predictions showing promise of coming true in any sizable fashion. Similarly, the absence of clear statutes permitting risk-averse state and local government purchasing agents to enter into multi-year performance contracts has slowed the progress of the industry in many states.

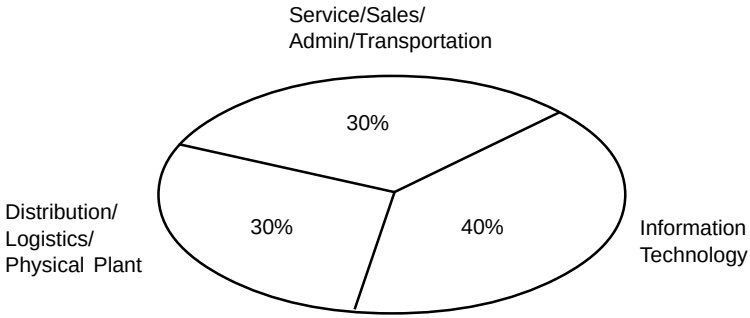
Even the private industry has procurement processes fraught with difficulties for ESCOs. Take the example of the industrial customer who likened entering into a performance contract to a special kind of operating lease, a financing mechanism often used by companies to avoid affecting their balance sheet, hence their borrowing capabilities. The industrial customer's plant facilities manager was told by head office that its lease-purchase analysis showed that purchasing was preferable to leasing and that the plant could not enter into the contemplated performance contract with the ESCO. When the plant manager, incredulous, complained that his capital budget request for facilities improvement had just been turned down, he was simply told to "try again next year."

The Energy Outsourcing Phenomena

The energy services industry is riding the wave of outsourcing which is prevalent in the United States today. Within the past decade, the trend toward vertical integration of all aspects of manufacturing a product or providing a service has been reversed. The reason outsourc-

ing has been accepted so widely is simple: It costs less and often provides more flexibility in facing competition.

The outsourcing market in 1996 was divided into three broad areas as shown in Figure 2.*



- Total Value of Contracts Forecast for 1996 is ~$100 Billion, *Excluding* Manufacturing Subcontracts
- Scope is Industry-specific
- Induvidual Contracts Range from 5 to 9 Figures

Figure 2. Composition of Outsourcing Market

There are several objectives of successful outsourcing. These include the following:

Improving Company Focus

Most companies understand various aspects of energy services. Large companies have the resources to undertake whatever activities they wish. Being successful, however, generally requires focusing these resources in areas that are in the mainstream of their business.

Gaining Access to World Class Capabilities

When companies undertake to provide energy services for themselves, they invariably have to settle for second class results by people who are not experts in the field. An ESCO's first class services are the result of specialization and vast experience with many different situations and many customers.

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*Outsourcing Institute 1996. Additional information may be obtained at the Outsourcing Institute web page (http://www.outsourcing.com).

Reducing and Having Better Control over Operating Costs

Specialty companies not only do the work better; they can do it for less.

Freeing Resources for Other Purposes

Outsourcing frees internal resources to deal with problems that either cannot or should not be performed by others.

Making Capital Funds Available

Outsourcing to performance based companies who provide not only skills to undertake the work but also the investment funds for worthwhile projects, frees a customer's investment capital for investments which have higher value to the company.

Managing Risk Better

Outsourcing to specialty companies is a way to manage performance risk. In addition, if frees valuable management time to concentrate on problems which are more important to the company.

A BRIEF HISTORY OF THE INDUSTRY

Most modern ESCOs were formed in response to the Middle East oil embargo of the early 1970s, although two large facility controls companies, Johnson Controls and Honeywell, had offered performance contracts as a way of facilitating sale of their equipment. Time Energy, Inc. was one of the first to offer its products almost exclusively on a performance basis. Originally, as indicated in the opening paragraph, the company's objective was to sell its time clocks. When it discovered that selling shared savings was much more profitable, it focused efforts there. Another early company was Scallop Thermal, which was interested not only in controlling equipment which could be turned on and off, but also equipment which could be modulated to reduce energy costs. In the late 1970s NEES Energy, a subsidiary of New England Electric Company began to offer ESCO services as an unregulated branch of the utility. This company was started at the behest of George Sakellaris, then a NEES employee and one of the pioneers of this industry. Sakellaris later purchased NEES Energy from the utility to form NORESCO, one of the most successful independent energy service com-

panies in the 1990s. Another early independent entrant was Hospital Efficiency Corporation (HEC), which was started by David Dayton, another of the early pioneers of the energy services industry and who has also be credited with starting several other energy service related companies. This company, as its name suggests, specialized in providing ESCO services to hospitals. Hospitals, of course, were a prime target of ESCOs because of their long hours of operation. Hospital Efficiency Corporation was later purchased by Northeast Utilities.

The 1980s saw the emergence of several other ESCOs. Interestingly enough, none of the existing ESCOs had been very successful. There were several other reasons why others entered this business. First, oil prices had had two more dramatic increases since the first doubling in 1973. So ESCO projects became even more financially attractive. Second, as a result, manufacturers supplying the energy services market developed many new and more efficient devices. This was an answer not only to the perceived need for additional efficiency, but was also a movement to incorporate the new, low cost and powerful components available from the electronics industry. Finally, a new wave of what became known as demand side management programs became wide spread in the electric utility industry, which spurred installation of energy efficiency devices by providing subsidies to customers who installed them.

Among the numerous companies joining this industry in the 1980s were EUA Cogenex, Econoler/USA, Enersys, Puget Energy, Tamel Energy, SYCOM Enterprises, PESCO and CES/Way, just to name a few. Interestingly, by this time, utilities had begun to take a more prominent role in the industry. Of those mentioned, the following were electric utility affiliates: EUA Cogenex (Eastern Utilities Associates), Econoler/USA (Hydro Quebec), Enersys (Florida Power & Light Company), Puget Energy (Puget Sound Power & Light Company), SYCOM Enterprises (PG&E), and PESCO (PG&E).

The 1980s were a difficult decade for the industry. Even when ESCOs were affiliates of utilities, the ESCO operating unit itself was generally very small and relatively unsupported or (poorly) understood by its parent. During that era, contracts were still very complex. Moreover, very little of the contracting mechanisms used were widely accepted by the banking community. Customers were understandably difficult to convince.

The 1990s brought an unexpected benefit for the industry in the prospect of deregulation of the electric utility industry. Suddenly, this

industry which had often been disdained by the utility industry, took on new interest. For all the bad things that might have been said about ESCOs, one feature was decidedly characteristic of the ESCOs who had managed to survive the 1980s. Their customers generally gave them high marks for the quality of service provided. The ability to please customers in a competitive environment suddenly became a valued skill when it became clear that in a competitive utility market, electric utilities could no longer take customers for granted. Indeed, the very customers sought out by ESCOs were the large commercial and industrial customers who were among key customers for most utilities. For forward thinking utilities, the writing was on the wall: to remain a utility, one could ill afford to fail to provide ESCO-like services. As electric and gas utilities moved into this market, they have broadened the types of services provided to include many services which utilities are good at providing and which they also want to provide in a deregulated market. Among these are such services as: power quality services, energy procurement services (anticipating retail wheeling), capacity planning, all of which had been well beyond the scope of most of the original ESCOs.

ABOUT THE AUTHORS

Cary Bullock, P.E., is president and co-founder of Excelergy Corporation, a leader in web-based applications and customer transaction services for the energy market. With more than 20 years of experience in the energy industry, he founded the company in 1997 to tap into the enormous market opportunities that the deregulation and restructuring of the energy industry had brought about. Earlier, he helped set up major utility and energy service companies and defined product service offerings for them. Bullock also co-developed two widely used automated energy audit programs, XENCAP and XENCHECK, and was initial developer of the residential automated auditing programs, RECAP and Enercom. Bullock served as co-chairman of the Committee for Development of a North American Energy Monitoring and Verification Protocol (NEMVP), sponsored by the U.S. DOE, the U.S. EPA, the National Association of State Energy Offices, and the National Association of Energy Service Companies. He received his B.A. from Amherst College and a B.S. from the Massachusetts Institute of Technology, and is a registered PE. in Massachusetts.

George Caraghiaur has a 20-year record of accomplishment and

leadership within the energy and natural resources industry. He is currently vice president of strategic services for Excelergy, a provider of e-business solutions to retail energy companies. Before joining Excelergy, Caraghiaur ran a successful independent consulting firm providing strategic business planning, marketing, financial, and infrastructure development services to the energy services industry. Formerly, he was president of FPL Energy Services, Inc., and served as regional manager for Reliable Water Company, where he helped perfect the use of performance contracting for sea water desalinization in the international marketplace. A member of the Board of the National Association of Energy Service Companies for five years, Mr. Caraghiaur has worked on policy development issues. He holds an M.S. degree in mineral economics from Penn State University and a bachelor's degree in geological engineering from École Polytechnique de Montreal.

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