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Vendors as Industrial Energy Service Providers

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Introduction

Over the past twenty years, we have seen a transformation in U.S. energy markets, in part brought about by the energy crises of the 1970s and in part by a deregulation of energy markets begun in the late 1980s. With increasing energy prices, a new industry also emerged—energy services companies (ESCOs), with the business model of managing customers' energy use by utilizing specialized skills at a lower cost than the customers could achieve. This business model was predicated upon the assumptions that significant energy efficiency opportunities existed and that through the application of new technologies and expertise these energy savings could be realized. The savings would then be shared between the customers and the ESCOs (Elliott, Pye, and Nadel 1996).

During this same period, another business trend emerged—"outsourcing" non-core activities to allow industrial companies to focus on their main area of competence. These two trends appeared to set the stage for the emergence of ESCOs, with a promising target market of large, industrial energy-users. Unfortunately, the market has not evolved as many would have hoped.

This white paper discusses the reasons for the failure of ESCOs in the industrial market, and also describes an alternate business model that has emerged in the marketplace. These developments could affect what the methods are chosen to influence the industrial energy marketplace.

History of Industrial Energy Services

The initial energy crises of the 1970s moved energy efficiency to the forefront. The federal government launched the Energy Audit and Diagnostic Center program (renamed the Industrial Assessment Center [IAC] program in the 1990s) and progressive states such as New York started similar state programs. Electric utilities shifted their industrial customer service programs to begin helping customers use energy more cost-effectively. During the 1980s, utility regulators began to mandate the offering of demand-side management (DSM) programs.

Many of the initial customers for ESCO services were the utility DSM programs of the 1980s. Most DSM programs focused on prescriptive measures such as lighting retrofits where measurement and verification was simple. These were usually combined commercial and industrial offerings. Since most of the energy consumption and savings in industry are in the manufacturing processes (in contrast to commercial buildings, where lighting loads constitute a significant portion of the load), the penetration into the industrial market was modest (Elliot, Pye, and Nadel 1996).

As utility restructuring ramped up during the mid-1990s, many experts held out great hope for the success of utility-affiliated ESCOs such as *Entergy Energy Services*, *Duke Solutions*, and *CINergy Solutions,* along with a number utility program offerings such as *Southern California Edison's ENvest*^{SCE}. These ventures were well capitalized and had assembled many of the specialized skills needed to meet customer needs either internally or through strategic relationships. These utilities had existing relationships with industrial customers that it was hoped could be exploited to both parties' advantage. The Electric Power Research Institute (EPRI) established a network of industrial experts that utilities could call upon when working with industry. It was hoped that this service would further enhance the credibility of these utility ventures (Elliott, Pye, and Nadel 1996). Unfortunately, very few of these ventures have achieved much success in the industrial market, and most report that they were unable to make enough money in this market to warrant their involvement (Goldman et al. 2002). While ESCOs have had somewhat better luck in the institutional and commercial building markets, market activity has not reached the level many in the energy efficiency policy community had hoped for (Hedman 2002).

Of the utility-affiliated ventures, probably the most successful has been *CINergy Solutions* through its partnership with *Trigen Energy Corp*. *CINergy Solutions* has offered comprehensive energy solutions to industry, including energy procurement and onsite generation bundled with other services such as water, wastewater, and solid waste service. A number of non-utility ESCOs have also followed this model of bundled services with some limited success, but again with limited profits. The most successful have followed the plan of using an initial project at a single facility to build a relationship with a company, and then replicating the project throughout the company (Hall 2000; Riley 2000).

In recent years *Enron Energy Services* targeted the industrial market. Many market observers felt that Enron was ideally positioned to succeed in this market where others had failed. Enron had assembled a talented staff, was robustly funded, and aggressively marketed to the industrial customers. Unfortunately, it will remain unknown whether these contracts would have become profitable had the parent company not collapsed.

Reasons for Failure in the Industrial Market

Significant cost-effective energy savings can be realized at industrial facilities, as programs such as the New York State Energy Research and Development Authority's (NYSERDA) *FlexTech* and U.S. Department of Energy's Office of Industrial Technologies' *IAC* and *Plant-wide Assessment* demonstrate (Elliott 2001; Shipley, Elliott, and Hinge 2002). Industrial energy service ventures have not failed due to lack of energy savings, but due to other reasons, and the reason for each venture's failure is unique. However, following is a list of venture failure trends that have emerged.

- High cost of opportunity identification and deal completion
- Limited replicability site-to-site
- Low energy prices
- Perception that energy is not a core issue
- Lack of expertise in specific industries

- Unwillingness of industry to allow "outsiders" to make process modifications
- Limited access to decision makers within industrial firms
- Difficulty in evaluating success of projects

These hurdles may prove insurmountable for the traditional ESCO.

Role of Engineering Firms and Vendors

While the traditional ESCO model has not proven successful, we have continued to see an increase in outsourcing of services by industry (especially large companies), while at the same time recent energy market price volatility has increased interest in energy efficiency and reported corporate expenditure (Chopey 2001). Corporate tasks such as human resources and engineering are increasingly fulfilled by contractors, whose use offers several advantages to the company. The company no longer has to maintain dedicated corporate staff to fulfill the need and can obtain a broader range of expertise through the contractor's staff than can be justified with in-house staff. In some cases, the contractor's focus in a particular area affords it an advantage in obtaining products or services. In addition, contracting allows flexibility for changes in staffing levels as demand fluctuates. Outsourcing also has a number of drawbacks, however, including the loss of institutional memory when the contractor changes. To minimize this problem, many outsourced relationships tend to be very durable.

Major corporations appear to be reducing their dedicated energy management staff. This trend is reported by staff within firms as well as by outside observers such as trade associations and reporters. This continued decline in staffing has been occurring at the same time that many companies report an increased interest in energy efficiency. This interest is accompanied by reports of increased energy efficiency budgets and expanded project activity (Chopey 2001; Mardiat 2001; Riley 2000). The presumption must be that energy efficiency projects are being outsourced. The question is: "If traditional ESCOs are not doing the work, to whom are energy services being outsourced?" Based on extensive interviews conducted by ACEEE, the answer appears to be equipment vendors or engineering firms.

Advantages of Engineering Firms and Vendors

These companies appear to have several advantages over conventional ESCOs that address several of the problems traditional ESCOs face in the industrial market. Both engineering firms and vendors are perceived as sources of expertise; with knowledge of the plant and processes, they can position their projects to respond to plants' needs; and perhaps most importantly, they have access to company decision makers. Often, engineering firms will have an alliance with their industrial customers where the firms are effectively the facilities' engineering department.

Expertise

The vendor or engineering firm has an existing relationship with the industrial company, which relies upon it for products and services and the expertise to implement these to meet an existing need at the facility. In contrast, the ESCO is an unknown quantity to the industrial company perceived as having expertise in energy but knowing little if anything about the unique needs of the facility. As a representative from one company pointed out, ESCOs are deal-makers and not experts in energy efficiency, so most must rely on outside experts. ESCOs' main historical role is to function as a financial structuring partner for an industrial facility. Often ESCOs will subcontract technical work to other entities (Shah 2002).

Intimate Knowledge of the Plant and Process

Because the engineering firm or vendor is already onsite and involved with details of the facility, it is in a unique position to see opportunities for improving energy efficiency. At other times, the operating staff already knows about opportunities. Because of the existing relationship with the contractor, the staff will frequently bring these opportunities to the attention of the contractor as an alternative path to going through internal channels for implementing these projects. Thus the proposal will move forward with staff-level buy-in at the facility, while reducing the cost necessary to identify the project.

Not Perceived as an Energy Project

Many studies have documented that most industrial "energy" projects are undertaken for their non-energy benefits (Elliott, Laitner, and Pye 1997). Because these projects generally originate from within organizations, the projects can be easily positioned to emphasize their productivity, safety, or other benefits critical to the primary mission of the organization. In most cases, the decision to proceed will be made on the total benefits, not just the energy savings (Pye 1998).

Access

Increasingly, the vendor or engineering service contract is managed at the corporate level. In fact, at some large industrial firms, the comptroller or chief financial officer (CFO) is also assuming the role of manager of outsourced services. Thus the contractor has access to the industrial decision-maker, affording the contractor the opportunity to present proposals for additional work. Since increasingly these proposals will bundle financing, the involvement of corporate finance staff is critical if the proposal is to be considered. Most of the decision-makers will not be technical or energy management staff. In contrast, the traditional ESCO does not have this same access or the confidence of key individuals within industrial management, much less knowledge of whom these individuals are.

Business Models

While the equipment vendor and engineering firm has similar advantages, their business models will vary somewhat. The equipment or product vendor attempts to add services to enhance an existing product offering, while the engineering firm is more likely to be project focused, using its familiarity with a facility and access to decision-makers to propose additional project work. The underlying structures of these two groups of firms causes certain variations that may influence their success.

Value-Added Vendors

The model of selling additional products and services to enhance a base product is well established in many market segments such as information technology and financial services, with the term "value-added-reseller" (VAR) being used to describe this market model. In fact, there are a number of long-standing examples of this model in the industrial energy market. The oldest example is the water treatment service in the boiler segment. These companies enter into contracts to test boiler water, and provide treatment equipment and chemicals to reduce corrosion in boiler and steam systems. This service involves regular visits to the facility to test the boiler water and adjust the chemical treatment. The contract provides the companies regular access to the power plant and a regular interface with plant management. For many years, most of these companies have also offered boiler system tune-up services and controls.

More recently a similar business model has developed in the compressed air industry. Ingersoll Rand was a leader in offering value-added services with its compressed air systems. These services include system optimization, end-use measures, maintenance, and controls. The model can even be extended to outsourcing the compressed service entirely. Because adding extra products or amenities to customers has proven cost-effective for this industry, nearly the entire industry has adopted the approach (McKane 2002).

Most recently, we have seen a similar model begin to emerge in the motor marketplace. In this model, the motor equipment vendor provides ancillary equipment such as controls and sensors, and related services that increase the functionality provided by the motor system. Among these enhancements have been condition-based motor monitoring to improve reliability, installation of adjustable-speed drives, and smart control systems to optimize productivity. Many of these companies have begun to offer direct financing for equipment purchases, installation, and onsite servicing of the products. By using remote monitoring and control, the vendor can play an active role in the operation of the equipment. Because of the ongoing relationship, the vendor is in a position to offer additional services based upon past satisfaction with services.

The companies that appear to be emerging as leaders in this business model are national equipment manufacturers that offer a broad range of products. Nationally we have seen companies such as Emerson, General Electric, Baldor, and Beloit restructure and make strategic acquisitions that allow for greater synergies in marketing among their product groups, such as motors, drives, controls, and plant automations systems. These structural changes, combined with increased direct sales to large industrial users, create a new dynamic in the marketplace (Boteler 2001).

We have also seen similar trends occurring on the more local level. Some motor service shops have begun to offer value-added services. The motivation appears to come from concern that the traditional business model focusing on motor repair services may not be viable in the long term. Initially these have tended to focus on motor management and predictive maintenance services. However, at least one firm in the Northeast has hired engineers to begin offering system optimization services (Linn 2002).

Value-Added Engineering Firms

In contrast to the vendor model, the engineering firms' provisions of services are project focused rather than product focused. The engineering firm is brought onsite to design a process line or oversee the installation of a major piece of equipment. The familiarity with the technical details of the plant and their presence onsite affords firms the opportunity to identify additional projects. Their familiarity with the plant staff and perceived expertise allows them to make proposals that are likely supported by the process staff, and their existing contractual relationship affords them an opportunity to present their proposal to management.

Both industrial management and engineering firm staff report a significant increase in this type of activity (Mardiat 2001; Riley 2000). Many engineering firms are now expanding their capabilities by entering into agreements with financial services companies that allow the firms to aggregate projects for more attractive terms. Some engineering firms are also adding operating staff so that they are functionally indistinguishable from an ESCO in their ability to design, build, finance, and operate.

Strengths of Vendors and Engineers in Offering Energy Efficiency Services

Despite the overarching similarities between vendors and engineering firms, they have some distinct differences that may affect their success in the energy-efficiency-outsourcing field. Historically, engineering firms have been positioned as designers of systems, and not in operation and finance. However, the firms frequently act as an agent on behalf of the customer. ESCOs occupied the market position of providing a bit of engineering, a bit of operations, and a bit of financial risk management. Because of the historical difference, engineering firms will be accepting a large amount of risk involving themselves in both the operations and financial sides of providing energy services. Very few engineering firms have taken on that risk, and there are notable failures when they have, including power projects by Stone and Webster and the Washington Group.

Vendor firms are motivated to move into this market so as to add value to their product in order to gain an edge on the competition. Adding tune-ups and efficiency upgrades are not a stretch for companies that already employ technology experts. Not only are the companies' customer service reputations bettered, but also their "green" reputations that are important with the general public. In addition, larger vendors may already have access to capital allowing them to assume the financing role. Unfortunately, the offerings of vendors may be perceived as "tainted" because of their assumed motivation to sell more products.

Implication for the Design of Industrial Energy Programs

The industrial energy manager has historically been the focus of industrial energy efficiency programs. During the 1990s, this focus was broadened to include outreach to industrial senior decision makers, particularly those with a financial background (e.g., chief financial officer [CFO], comptroller) (Pye 1998). While this approach has achieved some success, it is difficult to gain access to these levels in the corporate structure, a situation compounded by the difficulty that these individuals do not view energy as a focus of their job.

Another approach that has proven much more successful has been an outreach to vendors by national and regional programs, particularly those focusing on motor systems and steam. The U.S. Department of Energy's (DOE) Motor Challenge (now Industrial Best Practices Motors) first advocated this approach with their Allied Partners initiative (DOE 1998). This initiative reached out to motor vendors to leverage their customer contacts to deliver *Motor Challenge* program services. An evaluation of the *Motor Challenge* program found this approach to be very successful (XENERGY, Inc. 2000). *Industrial Best Practices* has added several programs based on the success of this model, including *Allied Partners* programs for steam and process heating suppliers and motor driven systems. The next program rollout (aimed at vendors) will include a training program resulting in qualifying skills to use DOE's system assessment software.

Several regional premium-efficient motor programs have also made motor distributor involvement a key component of their programs (Benkhart 2001; Linn 2001). Nationally, the *Motor Decisions Matter* campaign has made involvement of motor manufacturers, distributors, and the motor service industry key to the strategic direction of the program (MDM 2001). As mentioned previously, the parent companies of some motor manufacturers are beginning to enter this market. Participation in this program has been particularly important to equipment vendors because it has given their offering credibility (Boteler 2002).

Similar outreach and engagement with engineering firms has not been as focused. Most engagement has occurred at the regional program level, reaching out to smaller engineering firms. These programs have shown limited success, as was seen in the Energy Center of Wisconsin's *Performance Optimization Service* (POS) initiative (Nadel et al. 2002). The engineers who participated were technically capable, but did not have the marketing skills, financial resource, or access to decision-makers needed to function in an energy service capacity.

Most of the engineering firms behaving in an energy service capacity are large, national firms (Mardiat 2001). Most have one or more specialized practices focusing on specific industries, and have large enough practice in that area to justify developing the special skills needed to meet customers' needs for expertise. Many of these firms are of the size that they can provide either financing of projects internally or in partnership with a national financial services company. Many larger engineering firms specialize in specific industries. A few industrial energy efficiency programs have attempted to exploit this structure, such as the semiconductor initiative in the Northwest that worked with the international consulting firm SuperSymmetry to influence that industry (Robertson 1999).

While both of these national models offer a promising path for delivery of energy efficiency services to large companies with multiple facilities, this model is less amenable to meeting the needs of smaller companies. As a recent ACEEE report documents (Shipley, Elliott, and Hinge 2002), providing energy efficiency services to small and medium-sized industrial facilities (e.g., facilities with total demand of less than one megawatt) is a challenge and requires an approach in which a comprehensive package of services is offered locally. To compensate for these limitations, state and regional initiatives can build a program to help enhance the engineers' skills and provide complementary service that allow the smaller firms to be successful with this business model, as NYSERDA has done in developing its contractor network to support its *FlexTech* program. This program model has proven successful in reaching smaller industrial firms within the state (Shipley, Elliott, and Hinge 2002).

Conclusions and Recommendations

The industrial market has proven to be much less amenable to energy services than had been hoped a decade ago. In part this results from the diverse nature of the industrial sector, lack of project replicability site-to-site, and significant uncertainties that exist in the energy marketplace. These factors result in razor-thin margins for the ESCO. In this environment, the business model that does appear viable is to offer energy efficiency services in conjunction with some other product or service (e.g., equipment or engineering services). This model makes use of the existing relationship and contacts that the vendor has with the industrial decision-maker. For vendors to succeed in this market, they will likely need to augment staff training and in some cases hire new staff or establish strategic relationships with other firms, while also establishing new channels of communication within their own organizations. As a result, some vendors will be unable to respond to these new market dynamics, and thus will be unable to participate in this market.

Both the equipment and engineering vendor models appear to be gaining some ground in the marketplace. To date, the public sector energy efficiency programs (e.g., utilities and governments) have focused principally on the equipment vendors. Significant potential exists to further expand this equipment vendor model (for example, in the motor service industry).

Less attention has been focused on the engineering community, in part because of the difficulties that programs have working with engineering firms, particularly smaller, regional engineering firms. These smaller firms are less likely to have continuing relationships with industrial firms, in part because their engagement is single project focused, and the firms lack many of the resources (e.g., specialized energy skills, project financing, and marketing) that are needed to succeed with this business model. A program approach such as the NYSERDA *FlexTech* can compensate for these limitations.

Large national firms are much more likely to have the skills necessary to succeed and have the continuing relationships with large national industrial firms, but are less easily identified by state and regional programs. The engineering firms may not be within the program region, and vendor/customer relationships may exist at the corporate level rather than at the facility in the program region. Assisting companies with establishing relationship with these national firms is a useful role for national programs. DOE's OIT *Allied Partners* program provides such a program framework, though it was perhaps too limited in its technical scope, which focused principally on motors and motor systems. An expansion to a more comprehensive industrial energy focus could enhance this program, though it must be kept in mind that the primary relationships will continue to be between industrial customers and vendors, not the government. The role of government as a validator may be particularly important to the vendors because of their perceived motivation to sell more products.

Taking the outsourcing trends to a logical conclusion, it seems reasonable that eventually services will be entirely outsourced (i.e., facilities will pay for each foot of conditioned space, as opposed to each foot of space and HVAC separately). If encouraged to participate in the market, both vendors and engineering firms could serve to profit greatly in energy efficiency.

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