# The Energy Services Company (ESCO) Industry: Analysis of Industry and Market Trends

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## ABSTRACT

As retail competition accelerates, energy service companies (ESCOs) are confronting major structural changes in the "energy services" industry and a business environment in which many large customers are re-thinking their energy-related purchasing practices. This paper analyzes recent trends in the ESCO industry and looks specifically at how traditional performance contracting firms are faring during the transition to a new market structure. We also discuss trends in both established and emerging ESCO markets. Key findings include: (1) Independent ESCOs are declining both in number and share of the market for energy-efficiency services; (2) Utility-owned ESCOs and retail energy service companies (RESCOs) are an increasingly significant force in the energy-efficiency services market; and (3) Performance contracting, long a hallmark of the ESCO industry, is being overtaken by other forms of energy service contracts in percentage of total revenue.

## Introduction

The process of electricity industry restructuring continues to accelerate. California, Massachusetts, and Rhode Island have already initiated full retail competition, and at least twelve other states have passed legislation, issued orders, or reached settlements designed to open retail electricity markets within the next six years. Over time, these changes are expected to lead to lower, but more volatile, electricity prices and new, innovative electricity-related products and services. Many new entrants—most notably retail energy service companies, and power and gas marketers—now offer a broad array of "energy services," some of which compete directly with services traditionally offered by energy service companies (ESCOs).

Yet as interest and participation in "energy services" grows, its definition becomes less clear. The lament from *The Gondoliers* applies to the ESCO industry: "When everyone is somebody, then no one's anybody." For the ESCO industry, this raises two fundamental questions: (1) Will ESCOs as we have known them prosper or decline in a restructured industry? (2) Will the market for performance contracting—historically the defining feature of ESCOs—grow or shrink?

In response to these questions we pose the following hypotheses:

- Few "independent" ESCOs will survive re-structuring with significant market share;
- Utility-owned ESCOs and retail energy service companies (RESCOs) will emerge from restructuring with a market share in energy-efficiency services that is at least comparable to that of equipment and controls manufacturers and power marketers; and
- The energy-efficiency services industry will continue to grow, although the percentage reached through performance contracting will shrink. Performance contracting, long a hallmark of the ESCO industry, will become less of a distinguishing feature.

This paper is organized as follows. In the next section, we highlight major trends in the ESCO industry. We then analyze developments in markets traditionally targeted by ESCOs (e.g, the institutional sector and opportunities created by utility DSM programs) and discuss some of the emerging markets targeted by ESCOs more recently (e.g., the federal market, "total energy management" services, and the industrial sector). We conclude by revisiting our hypotheses in light of the evidence gathered. Where appropriate, we update and comment upon predictions that were offered in our 1996 study of the ESCO industry (Goldman & Dayton 1996).

## Industry Trends

### Overview

ESCOs and other retail energy suppliers anticipate that, under restructuring, customer choice and commoditization will result in a narrowing of margins on bulk power services with increased product differentiation and larger margins on new, value-added services. Both of these changes require increased demand-responsiveness, flexibility, comprehensiveness, reliability, and product differentiation on the part of retail energy suppliers. Thus, virtually all serious participants in the new electricity markets have become or are becoming "energy service companies." Evidence of this conversion includes:

- the large number of electric utilities that have launched ESCO divisions, acquisitions, and new service offerings (see Table 1);
- the increasing number of energy saving performance contractors that have been pre-qualified by the U.S. Departments of Energy and Defense (DOE and DOD): 130 firms by DOE as of January 1998 and 75 companies by DOD for 1998;
- the growth in membership of the industry trade association, National Association of Energy Service Companies (NAESCO) and the vigorous recruiting of energy engineers;[1]
- the pursuit of opportunities "behind the meter" by power and gas marketers;
- the pace of mergers and acquisitions among companies focused on energy services; and
- an increase in the number of third-party financiers actively pursuing projects to finance.

### Energy Service Companies: Performance Contractors and RESCOs

Table 1 suggests one way to look at the types of organizations currently active in the energy services market. While not an exhaustive list, most of the widely-recognized entrants who have proclaimed themselves "energy service companies" in competition or in the press are included. For discussion purposes, we group companies into three broad categories: (1) traditional ESCOs, (2) retail energy service companies owned and/or affiliated with utilities, and (3) other entities with ESCO operations, including equipment manufacturers, power marketers, and property service companies.[2]

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[1] As of March 1998, NAESCO has 33 full members, 10 associate ESCOs, 80 affiliates, and five international firms.

[2] Not included in these categories are engineering, architectural, consulting, manufacturing, electrical/mechanical contracting, and technical specialty firms that may be on the DOD or DOE contractor lists but lack comprehensive energy performance contracting experience. The authors admit to probable omissions and errors, and apologize to those offended.

**Table 1.** A Partial List of ESCOs in Three Categories

| 1. Traditional ESCOs | 2. Retail Energy Service Companies (RESCOs) | 3. Other Entities with ESCO Operations |
|---|---|---|
| CES Way (acquired by Energy Pacific) | AEP Energy Services | Carrier |
| Co-Energy | Atlantic Energy/Delmarva—Connectiv | Conoco/DuPont |
| Cogenex; Citizens Conservation (acquired by Eastern Utilities) | BECo—EnergyVision | Enron Energy Services (acquired Bentley, others) |
| | BG&E—Constellation | Honeywell |
| Coneco (Boston Edison) | Brooklyn Union Gas Energy Services | Johnson Controls |
| Custom Energy | Carolina Power & Light—SRS (also acquired Parke Industries) | Landis & Staefa |
| DMC (acquired by Honeywell) | Central Hudson G&E Energy Services | Marriott |
| Energy Investment (acquired by Duke) | Central Maine—Combined Energy | Phillips Lighting |
| Energy Masters (acquired by Northern States Power) | Commonwealth Edison Energy Services | Polsky Engineering |
| Enersave | Con. Edison Solutions | Service Master |
| EPS (majority owned by PECo) | Consumers Power, MI—CMS Energy Services | Trigen |
| Financial Energy Management | Edison Source (CA) | |
| HEC (acquired by Northeast Utilities) | Energy Pacific—Enova Energy | |
| Noresco (formed by NEES, then independent, then acquired by ERI. Conogen, IEC, and Pequod also acquired by ERI.) | Duke Solutions | |
| | Entergy Enterprises | |
| | First Energy Services | |
| Onsite Energy (merged with Sycom in 1998) | FPL Energy Services | |
| Parke Industries (acquired by CP&L) | GPU–ENCON Services | |
| Planergy | HL&P Energy Services | |
| Power System Solutions | Illinova Energy Partners | |
| Proven Alternatives | KCP&L—The Conservation Group | |
| Rose Technology (Canada) | LG&E—Enertech | |
| Sycom (merged with Onsight Energy in 1998) | NEES—AllEnergy | |
| Tescor (Canada) | NIPSCO/Bay State Gas—Energy USA; Savage Engineering | |
| Viron (acquired by York) | Northeast Utilities—Select Energy | |
| Xenergy (acquired by NYSEG) | Pacificorp—EnergyWorks | |
| | Phila Electric Energy Services | |
| | PEPCO Services | |
| | PSE&G—Energis Resources | |
| | Sempra Energy Solutions (Enova & Pacific Enterprises JV) CES/Way | |
| | Southern Development & Investment Group | |
| | TU Energy Services | |
| | Utilicorp (with PECO) – Energy One (recently shut down) | |
| | VA Power—Evantage | |
| | WEPCO—Wisvest | |
| | WWP—Avista Advantage | |

### Category 1: Traditional ESCOs

Most but not all of the companies in this category started as "independents," (i.e., not owned by utilities or equipment manufacturers), although more than half have been acquired by utilities or others. In terms of size, most companies in this group have annual sales less than $100 million, derive most or a substantial part of their support from performance contracting arrangements, and are members of NAESCO. Some firms (e.g., Energy Investment, HEC, Xenergy) earn more of their revenue from engineering or consulting services than from performance contracting but are considered significant competitors by their ESCO peers.

### Category 2: Retail Energy Services Companies (RESCOs)

During the last several years, many utilities and others have formed RESCOs to offer behind-the-meter services to their customers. Organizations in this group can be a division of a utility or a separate subsidiary and can be either regulated or unregulated. Firms in this group have several distinguishing characteristics which differentiate them from companies in Categories 1 or 3. First, almost all of these companies have been formed recently. Second, they were typically formed as one element of a utility's strategic response to deregulation with the goal of retaining or capturing electric load (as opposed to traditional ESCOs who have been in the market for some years with a principal strategy of earning revenue from performance contracting). Third, in terms of staffing patterns, many utilities have transferred relatively large numbers of utility staff to their RESCOs in anticipation of eventual revenue, as opposed to ESCOs who typically draw staffing from the private market in response to immediate revenue prospects.[3] A fourth distinction is corporate culture and management backgrounds, which tend to be large-organization oriented as opposed to the more entrepreneurial, small-business culture and background of traditional ESCOs. At present, it appears that many RESCOs are investing (and probably losing) more money each year than many traditional ESCOs collect in total annual revenue. This "loss leader" type of investment strategy is based on the hope that new products and services will yield a positive return in years to come.

It should be noted that the distinctions between traditional ESCOs and RESCOs may well fade with time. Some utilities maintain both an "in-house" RESCO and an acquired ESCO (e.g., CP&L, Energy Pacific, NU, PECO). These dual structures are unlikely to be sustained in part because companies are likely to move towards closer organizational integration of their various retail services businesses as electricity industry restructuring proceeds. Moreover, the enthusiastic acquisition of formerly-independent ESCOs by utilities has begun to merge cultures, managements, and staffs. This process of integration is still evolving and is often chaotic and painful, but the infusion of traditional ESCO capabilities and techniques has clearly accelerated as utilities set up unregulated companies separate from the wires business. It is interesting to note that the prices paid by utilities for ESCOs reflect very high valuations of intangible assets. Presumably, utilities recognize the synergistic values of ESCO staffs, market positions, and competitive skills when combined with supply-side capabilities. Also, these high acquisition prices imply that the cost of setting up a new ESCO and gaining market share is even greater.

The early marching orders for RESCOs were to develop any service or product even remotely related to energy (e.g., security, telecommunications, information technology, preventive/predictive

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[3] A number of utilities (e.g., NEES, NU, PECO, CMS) have transferred over 100 employees to these new organizations.

maintenance) that might help establish a market position or retain customers in anticipation of competition. Well over $100 million has been spent and scores of products rolled out, although few companies have reported on their market penetration or revenues. Business strategies have been characterized by large and frequent changes in market focus, apparent even in press releases but more startling when viewed from the inside. It appears that many RESCOs are beginning to re-focus on services related to their core energy business, in part due to disappointing market response, particularly among residential customers (e.g., Utilicorp and PECO's decision to pull the plug on their EnergyOne joint venture). It remains to be seen the extent to which RESCOs will rely on performance contracting as a principal marketing strategy.

Our second hypothesis suggests that Categories 1 and 2 in Table 1 will merge over time and capture market share at least equal to that of Category 3 (below).

### Category 3: Other Entities with ESCO Operations

This group includes energy service operations of equipment and controls manufacturers (e.g., Johnson Controls, Honeywell), energy marketers (Enron Energy Services), and property management firms. Some companies in this group are well-established performance contractors; others are new entrants. Although a shorter list, revenues of companies in this category that are attributable to energy-efficiency or performance contracting-related projects substantially exceed the total revenues of "traditional" ESCOs. One distinguishing feature of firms in this category is that their business strategy for their ESCO operation often includes broadening the market for the equipment and services of their respective core businesses. However, the controls companies and some of the energy marketers maintain ESCO operations as profit centers with unbiased charters.

## Demise of the Small, "Independent" ESCO

One key industry trend suggested by recent developments is the decline of privately held, independent ESCOs. We define "independent" in two ways: (1) ESCOs that are not affiliated with a utility or equipment manufacturer, and (2) "independent" in the sense that ESCOs represent themselves as stand-alone project developer that market, design, and implement projects.

There is increasing evidence to suggest that few "independent" ESCOs are likely to survive electricity industry restructuring. Prior to restructuring (circa 1995), the ESCO industry consisted of firms affiliated with building controls companies, firms affiliated with utilities, and a significant number of unaffiliated small to mid-size firms. This group of "independent" ESCOs were never dominant players in the ESCO industry in terms of revenue. Many of these firms targeted niche institutional markets (e.g., CES/Way, Energy Masters, Co-Energy Group) or grew through participation in utility DSM programs (e.g., Noresco, Sycom, Proven Alternatives, Onsite Energy, Enersave, Planergy). Over the last several years, most of these firms have been bought by utilities or electric/gas marketers (e,g., Energy Masters was acquired by Northern States Power, CES/Way was purchased by Energy Pacific, Noresco was bought by ERI). The few remaining small "independent" ESCOs are attempting to increase their market presence and reach either through strategic alliances with power or gas marketers or mergers (e.g., Onsite Energy's recent merger with Sycom). A few of the small "independent" ESCOs have re-positioned themselves as contractors in a particular aspect of the project development process in an attempt to find profitable niches (e.g., construction management, project engineering) and no longer act as project developers.

### Strategic Alliances: Marriage, Divorce, and Cohabitation

Nearly all energy services companies in our three categories have been engaged in multiple courtships, primarily with each other (see Table 1). Some of these interactions have led to serious negotiations and "due diligence" proceedings, but, to date, lawyers and investment bankers have been the only consistent winners. Among the reasons for broken engagements are mutual suspicions around jockeying for and capturing the allegiance of customers. Controls companies, utilities, and power marketers all have designs on national accounts and large energy users, and all are confident that they can eventually provide the broad array of services.

Although most formal joint ventures involving ESCOs have ended in "divorce," "marriages" in the form of acquisitions have recently accelerated (see Table 1). Deregulation is a key driver for these acquisitions as increased competition prompts utilities and marketers to seek greater margins and a stronger customer bond behind the meter. Another form of alliance is far more prevalent, however, and might be likened to "cohabitation." These marketing or "strategic" alliances have proliferated in response to three demands: (1) the potential of selling comprehensive services, in particular a one-stop combination of energy supply and demand-side services, (2) the need to establish a national presence to serve national account customers, and (3) the need to form bidding teams which include all the capabilities required by DOE and other federal agencies in their Energy Saving Performance Contract (ESPC) solicitations. Many such cohabitations, especially bidding teams, are not intended to last beyond their ad hoc purpose. Others, however, have been launched with the hope of eventual marriage. Their success will depend on the market's response to packaged services and national offers, both of which have yet to be seriously tested.

HEC's experience with strategic alliances is illustrative of the broader co-habitation phenomenon. HEC is owned by Northeast Utilities and has formed a joint venture with Arizona Public Service (APS). HEC has also signed strategic alliance agreements with a rural cooperative's marketing arm, a leading gas/power marketer, and two large international manufacturers who want to form ESCOs in the Pacific Rim market. Similarly, Energy Performance Services, Inc. (EPS) has formed a number of foreign alliances, and many other ESCOs are negotiating domestic partnerships. In addition, many utilities have recruited ESCO provider networks to deliver services to their customers as required.

The jury is still out on how well these alliances will penetrate traditional and new markets. However, we believe that some strategic alliances will ultimately prove quite successful in delivering energy-efficiency services as part of a broader set of retail energy services.

## Market Trends

In this section, we focus on traditional and emerging markets for ESCOs. For each market sector, we discuss business opportunities for energy efficiency and identify key market drivers. We also discuss the potential impacts of retail competition as it relates to business opportunities for energy-efficiency and other value-added services.

### The Institutional Sector: Mainstay of Performance Contracting

Historically, the institutional sector has accounted for about 60% of ESCO activity. Over 35 states have enacted legislation that enables schools, universities, and local and state governments to undertake

energy-efficiency investments using performance contracting approaches.[4] Moreover, the underlying market drivers that have allowed performance contracting to gain an important foothold in these markets are still quite compelling: public and nonprofit agencies continue to face severely constrained capital budgets, aging buildings and equipment in need of modernization, incentives to reduce operating costs, and lack of in-house technical expertise. (In these respects, private/for-profit agencies are increasingly in the same boat.) ESCOs have also focused on the institutional sector because its members tend to be stable over performance contracting terms (i.e., good "credit risks") and their facilities typically require common energy-efficiency technologies. With the advent of restructuring and the declines in utility DSM spending, many ESCOs have made concerted efforts to return to their original roots and have increased their marketing activities in the institutional sector. RESCOs are also targeting institutional markets, further intensifying competition.

In the K-12 schools market, it appears that the performance contracting market is still growing, albeit at a slower rate than over the last decade. Because the number of competitors has increased significantly, the market share of ESCOs that have historically been very active in this market may well be decreasing slightly with downward pressure on margins. For example, Florida has roughly seven to nine ESCOs that are currently active in the schools market. As school district energy managers have grown more familiar with the performance and savings attributable to high-efficiency equipment, they have become increasingly interested in stipulating energy savings for projects at the outset or limiting verification activities to short-term commissioning, rather than ongoing, long-term measurement and verification (M&V) of savings.

In the local government market, performance contracting also appears to be growing as dozens of solicitations have been issued and many have been awarded to experienced ESCOs. The sales cycle is typically longer compared to school districts. These projects are often more complex technically than the K-12 school projects, and local governments, particularly larger entities, are more likely to have trained energy managers. Several recent competitions (e.g., the Metropolitan Government of Nashville and Davidson County, TN) meet the criteria used by most ESCOs when deciding to expend substantial competitive effort: sufficient savings opportunity; rational competitive process with clear evaluation criteria and without apparent bias; affordable proposal requirements; and local contractors available for installation and service. On the downside, local governments are susceptible to slow and irrational procurement practices brought on by political influences such as that of a few large bidders who are also large local employers (see the successful protests lodged against 1998 contract awards in several major U.S. cities). Only a tiny fraction of local jurisdictions have issued ESPC-type solicitations thus far, suggesting a significant market potential. However, there is some concern that the most attractive efficiency opportunities have already been implemented in the larger public buildings, leaving capital-intensive work that cannot pay for itself only out of savings.

Local governments and hospital associations or chains have also been among the most active participants in retail competition pilots. For example, in California, many cities, counties, water districts, universities, and state agencies have issued solicitations for retail energy suppliers and are quite interested in aggregating loads of their own buildings as well as residents and local businesses (on a voluntary basis);

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[4] Enabling legislation typically addresses barriers to performance contracting which often arise due to existing public-sector procurement rules. Legislation often specifies maximum contract term and economic payback, allows agencies to sign long-term contracts without violating non-appropriation clauses, and clarifies the financial impact of performance contracts on the agency.

local school districts have been much less active. Based on a review of solicitations nationally, approximately 40 percent of the governmental agencies have expressed an interest in having retail suppliers offer various types of energy-efficiency services (Golove, Goldman & Pickle 1998). Thus, it is conceivable that energy-efficiency services may increasingly be provided in local, state government and university markets by winning retail energy suppliers who, as part of their scope of services, propose energy-efficiency and demand-reduction projects based on the results of facility energy audits, analysis of load profiles, and master energy plans.

**From DSM to PBCs: What Role for ESCOs?**

Over the last decade, utility DSM programs, when well designed and implemented, created significant market opportunities for the ESCO industry. These programs often allowed ESCOs to leverage efforts in existing markets and promote performance contracting in new markets. ESCOs have been adversely affected by the reductions in utility spending on energy-efficiency programs, which have decreased by 50 percent since 1993. Not surprisingly, cuts in DSM spending have been most pronounced among utilities in states where retail competition has already begun or is imminent.[5] However, in the near term, utility-sponsored DSM programs still remain an important potential driver for ESCO activity in a number of states. For example, in Minnesota, the Department of Public Service recently approved a $61 million DSM budget for Northern States Power (NSP) for 1998 and 1999, some of which will go to DSM bidding. Similarly, in Wisconsin, Texas, and Colorado, several utilities (e.g., Wisconsin Electric Power Co, Texas Utilities, Central and Southwest, and New Century Energies) are currently engaged in bidding or have recently issued RFPs for DSM services. Even where such programs exist, however, there is some evidence to suggest that utilities are only reluctantly supporting continued DSM activities. In contrast with past bidding programs, RFPs for DSM services are often quite brief—in some cases just four pages long—and require responses to be equally parsimonious. This approach allows utilities to evaluate proposals more quickly and at lower cost. ESCOs also incur lower costs for bid preparation under this abbreviated process, though the bottom-line figure for ESCO related DSM activity—utility expenditures on energy efficiency—remains significantly lower than where it stood in the early 1990s (Violette 1998).

In our 1996 paper (Goldman & Dayton 1996), we hypothesized that even with cutbacks in DSM funding, ESCO-utility relationships might remain strong as utilities, often using shareholder funds, would seek to partner with ESCOs in order to offer more services, and in so doing, retain customers as competition approached. In fact, however, we have not seen the number or degree of ESCO-utility partnerships that we anticipated. Very few alliances between investor-owned utilities and ESCOs have succeeded and several have failed. However, municipal utilities and rural cooperatives (e.g., Touchstone, the national brand of over 400 rural electric cooperatives; North Attleboro, MA; Central Electric Cooperative, SC) are increasingly contacting ESCOs for help with their industrial and public customers. They are competing with investor-owned utilities and are unlikely to develop in-house capabilities, so some ESCOs expect them to become marketing partners.

As DSM expenditures decline, a new source of funding for energy-efficiency activities may come from "wires charges" targeted for public-purpose programs. A number of states that are furthest along in the restructuring process have enacted public-benefits charges (PBCs) to support energy-efficiency

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[5] For example, Consumers Energy and New York State Electric & Gas cut direct energy-efficiency spending from $47 and $44 million respectively in 1993 to under $5 million apiece in 1996 (EIA 1997).

activities. These PBCs represent an important source of funding, although these funds are often guaranteed for only a relatively short time period. In some states, PBC funding levels have been significantly reduced and several states have chosen to target their limited energy-efficiency funds for various types of "upstream" market transformation activities or to overcome market barriers faced by smaller customers. In these states, PBC funds will not provide leveraging opportunities for ESCOs that have traditionally targeted larger commercial and institutional customers. A few states (e.g., California, New York, New Jersey) have included continued support for a private-sector energy-efficiency services industry as an explicit policy objective. Where such a commitment exists, standard performance contracting programs will likely emerge as the dominant form of publicly supported ESCO activity (Goldman et al. 1998). In the long term, however, ESCOs must expect that PBC funds will play a decreasing role in revenue-related activity. This situation could be altered, however, if a PBC fund mechanism for energy efficiency is included in future federal legislation that addresses electricity restructuring.

**The Federal Market: A Boon to Performance Contracting and ESCOs?**

In seeking to break out of their more traditional markets, ESCOs have long looked to the federal market for energy-efficiency services. Until recently, however, few ESCOs have had the fortitude to expend significant marketing resources in this difficult-to-penetratesector (exceptions include CES/Way, EPS, Co-Energy Group, Citizens Conservation Corporation). NAESCO has been working, not always in harmony, with DOD and DOE for years to rationalize the procurement process, with gradual success. That process has yielded a series of pre-qualification rounds followed by regional competitions to develop "short lists" of experienced ESPC contractors (see Table 2). The arguments for selling into the federal market include:

- Federal legislation and Executive Orders that direct agencies to reduce energy consumption by 20% and 30% per square foot by 2000 and 2005 relative to a 1985 baseline;
- Market potential: estimated $5 billion investment in energy-efficiency projects needed to meet EPAct and Executive Order 12902 requirement (Allenby 1996);
- The need to replace/upgrade infrastructure;
- Significant efficiency opportunities evident in federal facilities;
- Congressional preferences for private capital over public appropriation, explicit in EPAct and other authorizations; and
- Commitments to eventual privatization of energy/water/waste management.

In recent years, contracting approaches available to federal customers for procuring energy-efficiency services have proliferated. Thus far, it has been easier for federal agencies to develop energy-efficiency projects by contracting with utilities for these services under either a GSA Area-Wide Contract (AWC), Basic Ordering Agreement, or Agency-specific Agreement. Some utilities have chosen to use their ESCO affiliates as project developers and managers on these projects. Other ESCOs have gotten some work as subcontractors under utility AWCs, although they have rarely acted as performance contractors.

Despite efforts at streamlining (e.g., regional approaches such as the Federal Energy Management Program's (FEMP) "super-ESPC" process and the Army Corp of Engineers solicitations), the ESPC approach still appears to be formidable for many agencies to utilize. It is still difficult for a pre-qualified ESCO to be selected by a particular facility. ESCOs may well discover that facility procurement officers prefer the "old rules," or that approvals of proposed work (which must be defined at the ESCO's risk) are slow in coming, or that government payment procedures are complex, leading to delays in payment.

**Table 2.** Status of Federal ESPC Solicitations[6]

| Awarded | | | |
|---|---|---|---|
| **Agency** | **Project** | **Status** | **Administered by** |
| NASA | ESPC Goddard Ctr.,MD | Set Aside for 8(a) firms; Lord+EMR | NASA/Goddard |
| Air Force | Region 2 Midwest ($200 million) | Awarded to 6 firms | ASC/PKWOSB |
| Air Force | Region 3 Mountain ($170 million) | Awarded to 3 firms | HQ AFSPC/CONF |
| Air Force | Region 4 East ($250 million) | Awarded: Evantage/HEC, others | ACC CONS/LGCE Langley AFB, VA |
| Air Force | Region 5 West ($250 million) | Awarded to 3 firms | 60 CONS/LGC |
| Army Medical Command | Various Forts in 9 states[7] | Awarded: Johnson Controls, Duke Solutions, Evantage | Army Medical Command Ft. Sam Houston |
| Army | Ft. Huachuca, AZ | Awarded: HEC | Army Corps of Engineers, Huntsville |
| Army | 4 Southeast States | Awarded: Co-Energy, Duke, ERI, HEC, Honeywell, Noresco, Systems Corp. | Army Corps of Engineers, Huntsville |
| Army | FORSCOM 46 States | Awarded: CES/Way, Duke E&S, Abacus, Cenerprise/EPS, ERI, HEC, Honeywell, Johnson Controls, Noresco, Viron, Xenergy | Army Corps of Engineers, Huntsville |
| DOE | West Region | Awarded: Enova/SAIC/HEC/Cogenex, Bentley, ERI, Johnson, Honeywell | DOE HQ Procurement with FEMP |
| DOE | Southeast Region | Awarded: CES/Way, Duke, Energy Masters, ERI, Honeywell, Johnson | DOE Oak Ridge |
| **Pending Decision or Negotiation** | | | |
| **Agency** | **Project** | **Status** | **Administered by** |
| Army | Osan & Kunsan Air Bases, Korea | 3 firms selected to conduct competitive audits: EPS, HEC, Noresco, submitted 5/13/98 | Army Contracting Command, Korea |
| Air Force | Region 1 South ($200 million) | Submitted clarifications 2/13/98 | 325th Contracting Squadron/LGCX |
| Air Force | Region 6 TX | (1997) | |
| DOE | Northeast/Mid-Atlantic ($250 million) | Submitted 2/23/98 | DOE HQ, DC |
| DOE | Central/Midwest ($250 million) | Revision to original proposal submitted 1/30/98 | DOE/Golden, CO Field Office |
| DOE | Photovoltaic in US ($50 million) | Submitted 5/29/98 | DOE Golden |
| DVA | Various Medical Centers | Some regions bid, some not yet released for bid | DVA "VISNs" |
| EPA | NF VEL | Winner selected, still in negotiation | The Laboratory itself |
| Navy | All US Facilities in Japan | Submitted 5/27/98 | NAVFAC, Port Hueneme, CA |

[6] In addition to those listed here, eight other ESPC solicitations have been released but are not yet pending decision or are yet to be released but expected in the near future.

[7] Considering use of Army Corps of Engineers for remaining states.

Moreover, among those agencies choosing ESPC methods, it is unclear to what extent they may seek to use intermediaries, such as FEMP or the Army Corps of Engineers, or push to develop site- or agency-specific ESPCs. Table 2 shows the contracting agencies so far active in ESPC solicitations.

Overall, use of AWCs transfers administrative expense and transaction costs from the procuring agency to the utility, but must be arranged by utility territories. The ESPC approach allows the combining of facilities throughout wider regions but is less familiar to and may appear more expensive (because of the long-term M&V requirements). The longer term of ESPC contracts (25 vs. 10 years) supports greater private investment and the argument for verifiable and guaranteed savings carries some political weight. However, the ESPC requirements for annual savings verification audits introduces additional costs to the project and Federal energy managers may well conclude that the "savings guarantee" does not provide value-added for certain types of projects. They may well prefer a one-time system and equipment commissioning requirement which is easily incorporated in AWCs.

We would offer the following observations regarding the market for energy-efficiency and other retail services in the federal sector. First, contracting approaches adopted by agencies vary across region and time. Second, transaction costs are likely to be high and specialized expertise in Federal procurement and contracting alternatives will be required for those companies seeking to develop energy-efficiency projects in this sector. Third, thus far, it is apparent that significantly fewer dollars have been invested in energy-efficiency projects through ESPC approaches compared to utility services contracts. Fourth, a significant fraction of the potential energy-efficiency work in the federal sector remains undone (i.e., roughly 50-70%) and it is unclear ultimately how much of the federal market for energy-efficiency services will be accessed via ESPCs vs. utility services contracts. Fifth, federal agencies (e.g., GSA, DOD and the individual service branches, U.S. Postal Service) are active participants in states with pilot or full-scale retail competition programs and have announced awards to retail suppliers. In a few cases, these awards include both commodity and other value-added services, which may provide another avenue to deliver energy efficiency.

**Total Energy Management: A Difficult Sell?**

Another oft touted new market for ESCOs lies in providing "total energy management" solutions. A number of analysts have predicted that commercial and institutional customers will be receptive to supplier offers to provide whole-building or end-use energy services and that total energy management product and service packages will become a significant new market for ESCOs, RESCOs and others (LeBlanc 1995; Lenssen & Newcomb 1996). In this approach, suppliers provide "full-service" energy supply and efficiency improvements on defined services at a unit price (e.g., chilled water, compressed air, steam, refrigeration). Some high profile integrated energy services contracts include Microsoft's agreement with Johnson Controls and Dreamworks Studios arrangement with Energy Pacific. Likewise, PG&E Energy Services' recent agreement with Ultramar Diamond Shamrock is intended to involve both commodity supply and a range of efficiency equipment, auditing and other energy management measures (Kranhold 1998). Yet while such agreements hold the promise of unlocking a lucrative new market for ESCOs and others, they are not yet occurring on as frequent or a sustained basis as early boosters had hoped.

One problem confronting those seeking to sell a comprehensive package of energy services is consumers' lack of familiarity with integrated arrangements as well as their relatively low level of concern about energy and facility management (Lenssen & Newcomb 1996). High technology companies may be more sensitive to these issues and particularly to questions of power quality, which may be one reason

some high-tech firms have expressed interest in comprehensive outsourcing options (Lenssen 1998). Differences in contract duration for commodity supply and financing of efficiency-related projects poses another stumbling block for those offering total energy management service packages. Many large energy consumers are looking for only short term (i.e., one- to two-year) energy supply agreements and they do not want to be locked into one supplier for contracting periods required to service debt on major capital investments in high-efficiency facility renovations and HVAC equipment. At present, total energy management services represents more of a potential market opportunity, one which has not yet proven substantial market demand or profitability.

Although the market for total energy management services is in its formative stages, this does not mean customers are disinterested in obtaining specific value-added services along with commodity supply. Analysis of RFPs for supply and services shows that some customers, especially institutional customers, are in fact eager to obtain selective energy-efficiency services such as energy auditing, load management, and controls from their non-utility energy provider (Golove, Goldman, & Pickle 1998). In states such as California, where billing and metering services have been unbundled, there is also extensive interest in and intensive competition to provide sophisticated metering and billing options.

**The Emerging Industrial Market**

Another potentially lucrative but to date largely untapped market for ESCOs lies in the unrealized opportunities to increase energy efficiency in industrial manufacturing and processing plants. This market has been difficult to penetrate in a regulated environment because national strategies were rendered inefficient by the lack of choice among energy service providers other than the incumbent utility. Now, however, there is vigorous competition among power marketers and utilities as well as the gas traders who have been in this market for several years. Some of these competitors are including demand-side improvements in their offers, and extending guarantees of savings (e.g., Enron, Engage Energy/HEC). Although many sophisticated pricing/trading structures are being marketed, significant savings are hard to guarantee on commodity prices alone because of slim margins and price volatility. Thus the substantial opportunities to reduce consumption and optimize demand profiles become attractive means to guarantee long-term customer cost reductions. Substantial sentiment among plant managers that is favorable to outsourcing is also evident in the trade press.

ESCOs have not rushed into this market opening for several reasons, principal among them being the complexity and sensitivity of industrial processes. One cannot claim to be expert in all the operations evident from scanning the SIC code list, and plant managers are unlikely to trust strangers with interrupting production. However, ESCOs may begin to have more success as they separate energy uses that are organic to processing from those that are overhead. This is essentially an accounting distinction, but it gets at the heart of marketing success. "Throughput energy" is counted in the product cost and peculiar to the production process, thus it is both sensitive to managers and inaccessible to non-experts. "Overhead energy" is often counted at higher levels in corporations and is common among many plants, thus it is not proprietary and more accessible to technologies offered by ESCOs.

It is feasible to compile a list of actual technologies (as opposed to plant types) and separate the "throughput" from the "overhead" items. The total number of really distinct technologies is a few dozen, and two-thirds or more are of the "overhead" variety: quite common among plants, familiar to ESCOs experienced in large institutional facilities, non-proprietary, and otherwise accessible. Overhead technologies also tend to be found in central plants (e.g., compressed air plants, boilers, chillers, refrigerators, etc.). Moreover, manufacturing and processing plants are not immune to the disease of

deferred maintenance. Private organizations are often as energy inefficient as public, especially at the "overhead" level, because of O&M staff cutbacks and a short-term focus driven by global competition.

The most likely penetrator of industrial markets may be strategic alliances developed by energy marketers (utility-owned or other). First, an alliance of marketers with ESCOs can reconcile the differing contract terms of commodity supply and debt service by taking on the whole responsibility for making steam, chilled water, compressed air, refrigeration, etc. This constitutes a very good "customer bond." Second, they are already in discussion with high-level decisionmakers about future energy purchases. Third, they can offer convincing guarantees of real cost reductions, combining the credibility of large energy companies with demonstrated efficiency performance elsewhere. And fourth, they are in a position to put the whole deal on a single monthly bill, including debt service on improvements that the plants know they need. However, we caution that the market for comprehensive supply/efficiency packages in this sector is still almost entirely speculative at this time.

## Conclusions and Some Predictions

In this final section, we offer concluding thoughts on our three hypotheses, based upon an analysis of industry and market trends. It is clear that a major consolidation of the industry is taking place. Few ESCOs are still operating that are not affiliated with utilities, equipment manufacturers, or marketers, although many of these companies are prospering under their new parents. These developments support our first hypothesis that few "independent" ESCOs will survive restructuring with significant market share.

We have also asserted that utility-owned ESCOs and RESCOs will emerge from restructuring with a significant share of the market for energy-efficiency services. Currently, dozens of utility-owned RESCOs are active in traditional and emerging markets targeted by ESCOs. Some of these RESCOs, in part due to their ESCO acquisitions, are already formidable competitors in certain markets (e.g., K-12 schools, federal sector). Other RESCOs appear to be struggling with developing products and services based on their core competencies while at the same time "re-inventing" their utility-oriented organizations and staff—whose experience is drawn primarily from regulated environments—into sales-oriented, demand-driven businesses. We believe that the combination of market pressures, merging of ESCO and utility cultures, managements, and staff, and various ad hoc bidding alliances will produce a smaller field of battle-hardened "new RESCOs." Over time, we expect that our first two categories of companies, "independent" ESCOs" and early-state utility-owned RESCOs, will effectively merge into a single group and become indistinguishable as the number of "independent" ESCOs continues to shrink and failing RESCOs withdraw from the field. This combination will emerge from restructuring with a market share for energy-efficiency services that is at least comparable to companies in Category 3 in Table 1.

Our third hypothesis focused on the future role of performance contracting in the energy-efficiency services industry and marketplace. Historically, ESCOs have relied on performance contracting as a way to: (1) distinguish themselves from other energy-efficiency service providers offering design and equipment installation (typically backed by a manufacturer's guarantee) or energy consulting services, and (2) overcome customer's concerns regarding the success of proposed energy-efficiency projects in reducing energy costs. In the language of economists, ESCOs used performance contracting to overcome customers' principal-agent concerns—the risk that savings would not be realized and lack of trust in the service provider—by tying ESCO compensation to demonstrated energy savings. Ironically, we would argue that the "successes" of performance contracting have partially undermined its future. Over the last decade, an increasing number of customers (and project financiers) have become more familiar and

comfortable with the kinds of services offered by ESCOs as well as their ability to perform. As such, customers are less likely to demand performance contracts, particularly for projects involving certain types of efficiency measures (e.g., lighting equipment changes).

We remain optimistic, however, about the growth of the *total* market for energy efficiency services as more broadly defined in this paper. Our hypothesis does not necessarily predict a net decline in performance contracting opportunities, at least in the near term. It does predict that the dominant role of such contracting for ESCOs will be reduced as total energy services revenues rise. The reason for this optimism is the broader definition itself, including such services as district heating/cooling, water conservation, wastewater treatment efficiency, appliance/HVAC service, fuel diversity and demand profile control, power quality and internal distribution upgrades, etc.

The prospects for performance contracting itself will be shaped by specific public policies, government programs, and market and pricing trends. In Table 3 we attempt to summarize these, including indicators that support both optimistic and pessimistic views of performance contracting's future in each of the markets that we have reviewed. The first three rows of Table 3 deal specifically with the market for performance contracting, whereas the last two rows deal with energy-service market demand in general.

In each market sector, we pose "key questions," whose answers we believe will determine the balance between the optimistic and pessimistic forecasts of performance contracting, as suggested in the indicators listed in Table 3:

**Key questions regarding the fate of ratepayer- and publicly-funded ESCO activity include:** (1) Will the decline in DSM spending be made up by public benefits charges to fund energy-efficiency activities? (2) Will there be comprehensive federal legislation on electricity restructuring and if so, will it include provisions that support energy-efficiency activities?

**Key questions in state and local markets include:** (1) Will more state and local governments adopt ESPCs as a way to improve their infrastructure and save local tax dollars? (2) Will their procurement practices be sufficiently free of patronage, xenophobia, and bureaucratic complexities to attract responsible bids from experienced contractors? (3) Are the opportunities for energy savings sufficient in the myriad of small local facilities to support substantial work without crippling transaction costs?

**Key questions in the federal market include:** (1) Over time, will most federal agencies procure energy-efficiency services through ESPC arrangements or utility services contracts (e.g., area-wide contracts)? (2) For ESPC solicitations that have been awarded, will delivery and task orders be approved for installation of energy-efficiency improvements, savings verifications documented, and avoided expenses applied to repayment, at an accelerated pace and with continued political support? (3) Will legislation re-authorizing ESPC be approved during the next several years?

**Key questions regarding ESCO penetration in the industrial sector include:** (1) Will the apparent global trend toward outsourcing really extend to central energy plants? (2) Will partnerships among RESCOs, ESCOs, and power/gas marketers succeed in marketing comprehensive supply/efficiency packages to large industrial accounts?

**Key questions regarding broad trends in pricing, paybacks for projects, and market penetration include:** (1) Will the expected decline in energy prices coupled with customer's tendency to focus on short-term prices rather than life-cycle costs mean that customers are less likely to use performance contracting to finance large capital improvements based on the expected savings stream? (2) Given the finite inventory of existing older buildings, new energy-efficient building codes, and a fifteen-

year history of ESCO market activity, is the universe of attractive payback opportunities shrinking more rapidly than the opening of unpenetrated markets?

Given these uncertainties in various market sectors, it is unclear if performance contracting activity will increase or decrease in absolute terms over the next three to five years. Especially in the institutional sector, where managers must often prove to trustees, funders, and voters that their investments are cost effective, we expect that performance contracting will continue to have a prominent position in the energy-efficiency services market. There are also some reasons to expect outsourcing of energy services to involve substantial performance contracting of a different type—the sale of end-use commodities like steam, chilled water, compressed air, refrigeration, etc. on a unit-priced basis Over time, we expect that the share of energy-efficiency services provided through performance contracting will shrink even as the overall market for energy-efficiency products and services continues to grow. This means that traditional ESCOs, that have relied on performance contracting as their "brand identity," will have to continue to adapt if they expect to thrive in the future.

**Table 3.** The Future of Performance Contracting?

| | **"Optimistic" Indicators** | **"Pessimistic" Indicators** |
|---|---|---|
| Ratepayer or Publicly-Funded Energy Efficiency | - Several state PUCs are using public-benefit charge (PBC) funds to develop Standard Performance Contract programs | - PBC funding levels lower than utility DSM; limited funds may be allocated primarily to "upstream" market transformation initiatives or smaller customer markets |
| State & Local Government Market | - Number of local governments have recently issued & awarded RFPs for performance contractors<br>- Large remaining market potential | - Local governments susceptible to slow & irrational procurement practices brought on by political influences<br>- Most attractive efficiency opportunities have already been completed in schools and larger public buildings, leaving capital-intensive work that cannot pay for itself out of savings |
| Federal Market | - ESPC likely to be re-authorized with continued political support<br>- Significant performance contracting work in the "pipeline"<br>- Privatization initiatives will provide additional stimulus | - Customers will continue to rely primarily on utility services contracts (e.g., Area-wide contracts)<br>- ESPC awards have produced few actual projects yet |
| Outsourcing & Industrial Markets | - Increasing interest in outsourcing among plant managers in trade press<br>- Compelling economic arguments in favor of minimizing "overhead energy" costs<br>- Restructuring removes barriers to comprehensive supply/efficiency packages | - Market is almost entirely speculative with little evidence of real commitment<br>- Disaggregated procurement remains prevailing practice |
| Price Trends, Paybacks, & Market Saturation | - Customer choice has captured attention of business decisionmakers more than energy conservation ever did<br>- ESCOs have developed business in low-price regions | - Building owners & operators concerned primarily with "first cost" not lifecycle<br>- As energy prices seek commodity levels, economic payback to customers will become longer<br>- Remaining building energy-efficiency opportunities must be depleted |

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