National Association of Energy Service Companies

NAESCO and the U.S.ESCO Industry

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PRESENTATION TOPICS

- What is NAESCO
- ESCOs and the Benefits of Performance Contracting
- Sample Projects
- Information from the NAESCO Database Project
NAESCONational Association of Energy Service Companies

- NAESCON is a trade association
- Founded in 1983
- Represents Energy Service Companies (ESCOs) and their trade allies
NAESCO MEMBERSHIP

- Energy Service Companies (ESCOs)
- Distributed Generation (DG) Providers
- Utilities
- Energy Efficiency and DG Product Suppliers, Distributors and Manufacturers
- Financial Institutions
- Engineering and Design Firms, Law Firms, Consultants
- Government Agencies
- International Members
What is an ESCO

An ESCO is a company engaged in developing, installing, and arranging the financing for comprehensive, performance-based facility improvement projects centered around improving energy efficiency and reducing maintenance costs.
What is an ESCO

Some ESCOs also develop and implement build/own/operate distributed generation, cogeneration, or combined heat & power (CHP) projects.

ESCOs may also arrange on behalf of the customer for electric and gas supply.
What ESCOs Do

- Qualified ESCOs provide a wide range of technical solutions and services
  - Perform investment grade audits
  - Provide project design & engineering
  - Arrange sources of project financing
  - Enable equipment selection & acquisition
  - Manage construction & equipment installation
What ESCOs Do

- Offer equipment & systems commissioning
- Undertake savings measurement & verification
- Offer equipment maintenance services
- Conduct technical training
- Assist with utility rate negotiation
- Facilitate access to available utility incentive or grant programs
- Assume performance risk
Benefits of Energy Performance Contracting

- ESCOs have a broad range of expertise in energy efficiency technologies
- ESCOs provide one-stop shopping for comprehensive project design and delivery, thus accelerating project implementation
- ESCOs educate prospective customers on the value of a net present value or life cycle cost-focused procurement
Benefits of Energy Performance Contracting (continued)

- ESCOs have a financial stake in long-term project performance and strong incentives to provide superior customer service after construction is completed.
- ESCOs contractually guarantee environmental standards of comfort (e.g., temperature, ventilation rates, and humidity and light levels).
- ESCOs contractually guarantee project savings.
Misconceptions About ESCOs

- ESCOs are financial institutions
- ESCOs carry all the project risk
Recent ESCO Projects

St. Barnabas Medical Center – Custom Energy
  ◆ 2 buildings; $5.3 million contract
  ◆ Installed new energy management system
  ◆ HVAC repairs
  ◆ Lighting retrofit
  ◆ Replace electric chillers w/ steam absorption chillers
  ◆ **RESULTS**: $690,000/year in energy cost savings
Recent ESCO Projects

Houston Independent School District – Sempra Energy Solutions

- 24 buildings; $12.7 million contract
- Replaced 42 chillers
- Retrofitted 24,000 lighting fixtures
- Constructed new 1,200 ton remote central chiller plant

RESULTS: $1,381,291 annual energy cost savings
Recent ESCO Projects

Syracuse University – Alliant Energy Integrated Services – Cogenex

- 8 million sq. ft.; $12.5 million contract
- Improvements to HVAC system
- Installation of energy management systems
- Installation of high efficiency motors
- Converting/replacing boiler plants

**RESULTS:** $1.8 million annual energy cost savings
Recent ESCO Projects

Fort Bragg – Honeywell
- 5,400 buildings; $14 million contract
- Automation of building controls systems
- HVAC and lighting retrofits
- Replacement of oil-fired steam plant with gas boilers
- **RESULTS**: $2 million annually in energy cost savings
Recent ESCO Projects

Allegheny County -- NORESCO

- 100+ facilities; $9 million contract (to date)
- Lighting retrofit
- Chiller replacement
- Energy management systems
- Water conservation systems
- Window replacement

**RESULTS:** $1,377,000 annual cost savings
Recent ESCO Projects

Additional Allegheny County Projects

- Allegheny County Housing Authority – Honeywell
  - Result: $806,000 annual cost savings
  - 45 buildings; $6,700,000 project costs

- Allegheny Valley Hospital – Siemens Building Technologies
  - 1 building, many wings; $1,449,514 project costs
  - Result: $402,061 annual cost savings
**NAESCO Database Project**

**Objectives**
- Track industry performance and evolution
- Project data useful for economic analysis, policy development, and technology impact

**Approach**
- NAESCO/Lawrence Berkeley National Laboratory partnership with voluntary participation from industry and government agencies
- Project data primarily from NAESCO accreditation process; 18% of projects are from state agencies
- Information verified through peer review and reference checks
ESCO Industry has Experienced Strong Growth

ESCO Market for energy-efficiency related services is ~$1.8-$2.1B in 2000; 24% annual growth rate (1990-2000)

Performance Contract revenues: $0.9-$1.0B in 2000
$2.55B of work completed by 51 companies; 1489 projects in database

Median and average project costs: $0.7M and $1.8M, respectively
NY, NJ, CA and TX account for 44% of market activity
Substantial market activity in NJ and MA where well funded energy efficiency programs have provided economic incentives
ESCO activities also high in populous states of IL, OH, IN, PA which have not supported utility sponsored or ratepayer funded energy efficiency programs
ESCO Industry Activity Led by 13 Firms

- Most activity performed by a few large companies: 13 “large” companies account for ~75% of total industry activity
- Prominence of large companies consistent over time
## Project Facility Types and Frequency in Database

<table>
<thead>
<tr>
<th>Facility Type</th>
<th>No. of Projects (N=1489)</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education (e.g., K-12 &amp; college classrooms)</td>
<td>552</td>
<td>37%</td>
</tr>
<tr>
<td>Food Sales (e.g., grocery store)</td>
<td>10</td>
<td>1%</td>
</tr>
<tr>
<td>Food Service (e.g., restaurant, cafeteria)</td>
<td>19</td>
<td>1%</td>
</tr>
<tr>
<td>Health Care</td>
<td>179</td>
<td>12%</td>
</tr>
<tr>
<td>Lodging (e.g., hotels, motels)</td>
<td>13</td>
<td>1%</td>
</tr>
<tr>
<td>Mercantile and Service (e.g., retail)</td>
<td>39</td>
<td>3%</td>
</tr>
<tr>
<td>Office (e.g., general office space)</td>
<td>238</td>
<td>16%</td>
</tr>
<tr>
<td>Public Assembly (e.g., stadiums, auditoriums)</td>
<td>29</td>
<td>2%</td>
</tr>
<tr>
<td>Public Order and Safety</td>
<td>41</td>
<td>3%</td>
</tr>
<tr>
<td>Residential Housing</td>
<td>53</td>
<td>4%</td>
</tr>
<tr>
<td>Warehouse</td>
<td>22</td>
<td>1%</td>
</tr>
<tr>
<td>Wastewater Treatment Plant</td>
<td>5</td>
<td>0%</td>
</tr>
<tr>
<td>Multiple</td>
<td>86</td>
<td>6%</td>
</tr>
<tr>
<td>Other</td>
<td>168</td>
<td>11%</td>
</tr>
</tbody>
</table>

- The majority of retrofit projects (65%) were implemented in educational facilities, offices, and healthcare facilities.
Typical project consists of multiple measures and strategies

- Lighting and HVAC are most common measures, in both institutional and private sectors
- Non-energy improvements (e.g., roofs, asbestos abatement) reported in institutional sector projects
Electricity Savings by Retrofit Strategy

**Lighting Only (N=63)**
- LO Median: 47% of targeted equipment baseline

**Lighting & Non-Lighting (N=94)**
- LNL Median: 23% of utility bill baseline
- LO Median: 47% of targeted equipment baseline

**NOTE:** All projects in LO sample employ Equipment Targeted baseline metric; LNL sample includes only Utility Bill baseline
Two baseline metrics: utility bill and targeted equipment
- Lighting only projects saved 47% of equipment targeted electricity
- Lighting and non-lighting projects saved 23% of utility bill electricity
Impact of Retrofit Strategy on Project Costs

- ESCOs investment levels significantly greater in Comprehensive Projects compared to Lighting Only
- Lighting project costs comparable across institutional and private sectors
SPT Influenced by Choice of Retrofit Strategy & State Guidelines

<table>
<thead>
<tr>
<th>Retrofit Strategy</th>
<th>Simple Payback Time (years)</th>
<th>Institutional Sector</th>
<th>Private Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>25 val</td>
</tr>
<tr>
<td>Lighting Only</td>
<td></td>
<td>146</td>
<td>1</td>
</tr>
<tr>
<td>Lighting &amp; Non-Lighting</td>
<td></td>
<td>498</td>
<td>5</td>
</tr>
<tr>
<td>Non-Lighting Only</td>
<td></td>
<td>98</td>
<td>2</td>
</tr>
</tbody>
</table>

- More private sector projects are lighting only (43% vs 20%); Two year SPT for institutional and private sector markets
- Lighting/non-lighting and non-lighting only projects payback time is much longer in institutional than in private sector
- SPT influenced by State performance contracting guidelines; 34 states allow max. contract term >10+ years
Project Investment Trends by Market Sector

- Median Project investment levels are 1.8 times greater in institutional than private sector projects ($2.50 vs. $1.40/ft²)
## Project Investment by Type of Contract Agreement

<table>
<thead>
<tr>
<th>Project Agreement Type</th>
<th>Project Cost ($M)</th>
<th>N</th>
<th>average</th>
<th>25 val</th>
<th>median</th>
<th>75 val</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Performance-based Contracts</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guaranteed savings</td>
<td>2.3</td>
<td>621</td>
<td>2.3</td>
<td>0.4</td>
<td>1.0</td>
<td>2.4</td>
</tr>
<tr>
<td>Guaranteed payout term</td>
<td>2.5</td>
<td>533</td>
<td>2.5</td>
<td>0.5</td>
<td>1.2</td>
<td>2.5</td>
</tr>
<tr>
<td>Asset ownership/chauffage</td>
<td>2.4</td>
<td>3</td>
<td>2.4</td>
<td>1.6</td>
<td>1.7</td>
<td>2.8</td>
</tr>
<tr>
<td>Shared savings</td>
<td>1.2</td>
<td>69</td>
<td>1.2</td>
<td>0.2</td>
<td>0.3</td>
<td>0.8</td>
</tr>
<tr>
<td>Pay-from-savings</td>
<td>2.4</td>
<td>15</td>
<td>2.4</td>
<td>0.7</td>
<td>1.2</td>
<td>2.3</td>
</tr>
<tr>
<td><strong>Non Performance-based Contracts</strong></td>
<td></td>
<td>160</td>
<td>1.6</td>
<td>0.2</td>
<td>0.5</td>
<td>1.2</td>
</tr>
<tr>
<td>Design/build</td>
<td>1.8</td>
<td>118</td>
<td>1.8</td>
<td>0.2</td>
<td>0.5</td>
<td>1.3</td>
</tr>
<tr>
<td>Fee-for-service</td>
<td>0.5</td>
<td>26</td>
<td>0.5</td>
<td>0.1</td>
<td>0.2</td>
<td>0.8</td>
</tr>
<tr>
<td>Fixed price</td>
<td>1.9</td>
<td>16</td>
<td>1.9</td>
<td>0.4</td>
<td>0.6</td>
<td>2.2</td>
</tr>
</tbody>
</table>

- Performance Contracting Agreements typically had higher project investment than the projects that reported non performance based contract.
- Median Project investment was $1.0 million vs. $.05 million.
Estimate that institutional sector projects generated $1.3 billion in net economic benefits with median B/C ratio of 1.6

Median B/C value of 2.3 highest in health/hospital projects

Median B/C ratios are 1.7 for state/local governments, university/colleges and federal government and 1.0 for schools (based on 7% discount rate)
Estimate that 309 private sector projects achieved $320 million in net economic benefits with median B/C ratio of 2.1 (based on 10% discount rate)
Performance Contracting is a Decreasing Share of ESCO Business

- Market share of performance contracting is decreasing among NAESCO members (92% to 76%)
- Design/Build & Fee-for Service approaches account for ~30% of ESCO projects in 1996-2000
Some ESCOs Install Onsite & Distributed Generation in Comprehensive Projects

- Measures include BUGs, Cogeneration, PV
- Location: mainly near Great Lakes and East coast - largest representation in NY
- Market sector: Mainly institutional sector (K-12 schools most popular)
ESCO Product and Service Strategies

- Performance contracting
- Design/Build Projects
- Build/own/operate major energy facilities
- Energy & Facility Management services
- Integrated energy services
Conclusions

- U.S. ESCO business is well established
  - Sell “solutions” to customers: EE is byproduct

- Impact of Electricity Restructuring
  - Retail competition stalled
  - FERC promoting Demand Response; creates opportunities for “clean” onsite generation

- ESCO business is fluid and will continue to evolve
  - Expect industry growth + firm consolidation