

Sustainable Business Development through Alternative Finance



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April 23, 2009

Agenda

- ▣ Introduction to Alternative Finance
- ▣ Alternative Finance Options
 - Power Purchase Agreements (PPAs)
 - Energy Savings Performance Contracts (ESPCs)
 - Utility Energy Service Contracts (UESCs)
- ▣ Helpful Online Resources
- ▣ Review
- ▣ Question & Answer Session

Introduction to Alternative Finance

Introduction to Alternative Finance

- ▣ **Definition**
 - **Methods to implement capital-intensive projects with little to no appropriations or available upfront capital**

- ▣ **Why use it?**
 - **High cost of delayed appropriations**
 - **It pays for itself over time**
 - **There is precedent for it**

- ▣ **When should it be used?**
 - **When appropriations or capital is unavailable**
 - **To leverage greater energy savings through bundling**

Alternative Finance Options

Alternative Finance Options Overview

- ▣ **Power Purchase Agreements (PPA)**
 - Private entity installs, owns, operates, maintains customer-sited (behind the meter) renewable equipment
 - Customer purchases power generated by the equipment

- ▣ **Energy Savings Performance Contracting (ESPC)**
 - Energy Service Company (ESCO) installs, maintains, and finances Energy Conservation Measures (ECMs) and guarantees the resultant energy and energy-related savings , which are used to pay back the ESCO over time

- ▣ **Utility Energy Service Contracting (UESC)**
 - Utility Company initiates ECMs and finances capital costs of the project to be repaid over time through savings recovered by a service charge added to existing utility bills

Alternative Finance Options

Power Purchase Agreements

Power Purchase Agreements

PPA contract length : Long term best – at least 10 years, preferably 20

- A partnership
 - Renewable Developer
 - Utility
 - Customer/ agency
- Primary Use
 - Demand Management
 - Offset load
 - NetZero
 - Renewable Energy



Photovoltaic array in Alamosa, Colorado

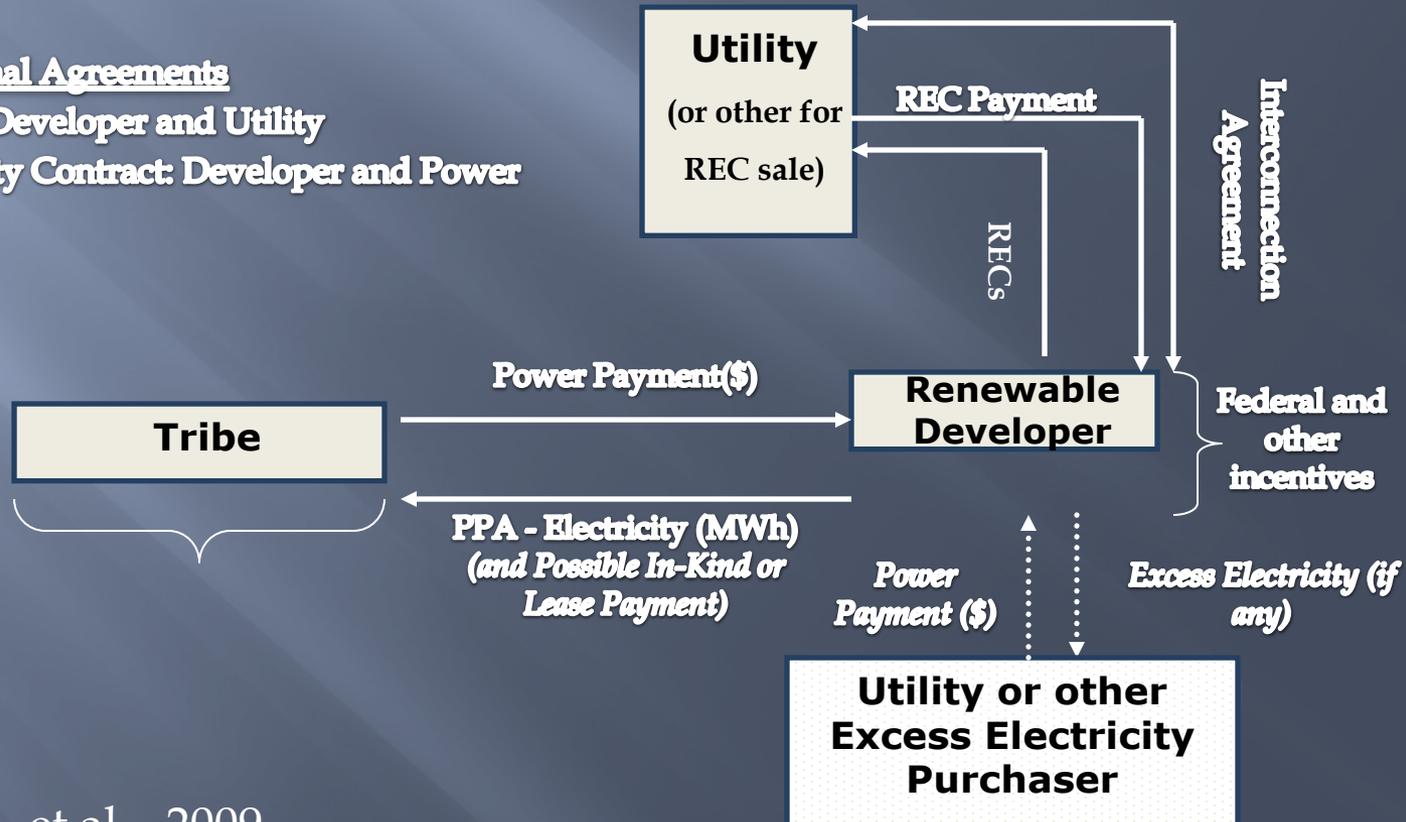
Renewable PPA Diagram

Agreements

- PPA: Tribal Site and Developer
- Land Use Agreement: Tribal Site and Developer (not shown on diagram)
- Interconnection Agreement: RE Developer and Utility

Possible Additional Agreements

- REC Contract: Developer and Utility
- Excess Electricity Contract: Developer and Power Purchaser



Power Purchase Agreements

- ▣ Approximately 15 MW on 140 acres including closed landfill
- ▣ PPA price – 2.2¢/kWh
 - ▣ Estimated \$1 million electricity savings/year, after standby charges
- ▣ FAR Part 41 utility service contract
 - ▣ Indefinite term with one year termination notice (using FAR Part 41 PGI)
- ▣ 20-year ground lease
- ▣ Ribbon cutting event December 2007
- ▣ RECs sold to Nevada Power (for state RPS solar set-aside)

Nellis AFB PV Project



Power Purchase Agreements

- ▣ 720 kW (1200 MWh) single-axis tracking, ~ 5 acres
- ▣ 20 year PPA contract (utilizing Western)
- ▣ 20 year easement
- ▣ RECs sold to Xcel Energy for RPS solar set-aside (20 year contract)
- ▣ PPA price equal to or less than utility electricity prices (based on EIA projections)
- ▣ Operational December 2008
- ▣ Additional PV projects in progress

NREL PV Project



Power Purchase Agreements

- ▣ 2 MW, 3200 MWh in first year (~2% of Ft. Carson's load)
- ▣ Fixed, non-escalating energy rate
- ▣ 17 year contract, with 3 year option (utilizing Western)
- ▣ No cost lease (using 10 USC 2667 lease authority)
 - ▣ RECs sold to Xcel Energy (20 year contract)
- ▣ Ground-mounted, fixed system covering 12 acre former landfill
- ▣ First Solar thin film, 25 year warranty
- ▣ Came on-line December 2007

Fort Carson PV Project



Power Purchase Agreements

- ▣ .5 MW roof-top PV (thin film)
- ▣ 10-year contract
- ▣ Price matched to utility energy rate, with price floor
- ▣ Utility rebate and federal incentives (30% tax credit & accelerated depreciation) - pay for approximately 1/2 cost
- ▣ License for use of roof
- ▣ Renewable developer retains RECs
- ▣ Came on-line March 2008

GSA Sacramento PV Project



Alternative Finance Options

Energy Savings Performance Contracting

Energy Savings Performance Contracting



- Dept of Energy Headquarters Building
 -
 - Uses 40% less energy than a typical office building
 - Implemented through an ESPC

Energy Savings Performance Contracting

- ▣ Implemented by Energy Service Companies (ESCOs)
 - Dept of Energy Qualified List includes 16 ESCOs
 - Some states have their own pre-qualified lists
- ▣ Key Points
 - Energy savings are guaranteed by the ESCO
 - Payments to ESCO made through savings
 - Payments cannot exceed savings
 - Measurement and verification of savings required
 - Project size ranges from \$2M to several hundred \$M

Energy Savings Performance Contracting

- ▣ **Energy Conservation Measures (ECMs)**
 - **Boiler Plant Improvements**
 - **Chiller Plant Improvements**
 - **Building Automation Systems/ Energy Management Control Systems**
 - **Heating, Ventilation, and Air Conditioning**
 - **Lighting Improvements**
 - **Building Envelope Modifications**
 - **Chilled Water, Hot Water, and Steam Distribution Systems**

Energy Savings Performance Contracting

▣ Additional ECMs

- Electric Motors and Drives
- Refrigeration
- Distributed Generation
- Renewable Energy Systems
- Energy/Utility Distribution Systems
- Water and Sewer Conservation Systems
- Electrical Peak Shaving/ Load Shifting
- Energy Cost Reduction through Rate Adjustments
- Energy Related Process Improvements

Energy Savings Performance Contracting

- ▣ **Additional ECMs (cont.)**
 - **Commissioning Systems**
 - **Advanced Metering Systems**
 - **Appliance/Plug Load Reductions**
 - **Future ECMs: Non-building applications**

- ▣ **History**
 - **Federal legislation authorized 1992**
 - **Dept of Energy regulated 1995**
 - **Permanent authorization 2007**

Energy Savings Performance Contracting

- ▣ Phase 1: Project Planning
 - Assemble acquisition team, site data, & requirements
 - Adhere to fair competition requirements
 - Choose a contractor OR down-select
- ▣ Phase 2: Preliminary Assessment (PA)
 - Kickoff meeting, preliminary site survey(s), review assessments
 - Submit Notice of Intent to Award

Note: contractors may be selected from requirements of a PA OR less than a PA

Energy Savings Performance Contracting

- ▣ **Phase 3: Investment Grade Audit (IGA) & Award**
 - IGA Kickoff Meeting
 - Issue Task Order RFP (federal) / Final Proposal
 - Negotiations & Award
 - Financial Risk, Performance Risk, and Operation Risk
- ▣ **Phase 4: Construction**
 - Post-award conference and review of design & construction package – Issue Notice to Proceed
 - Construction, inspections, witnessing, commissioning, measurement and verification (M&V), and project acceptance
- ▣ **Phase 5: Performance Period**
 - Ongoing M&V, reporting
 - Invoices and payments
 - Training and other services
 - Closeout of task order (federal) / contract

Energy Savings Performance Contracting

ESPC Quick Facts

- More than 460 ESPC projects have been awarded by 19 different Federal agencies in 47 states.

- Approximately \$2.3 billion has been invested in Federal facilities through ESPCs, saving more than 18 trillion Btu annually – equivalent to the energy used by a city of more than 500,000 people.

- Energy cost savings of \$7.1 billion for the Federal Government (\$5.7 billion goes to finance project investments). Net savings to the Federal government is \$1.4 billion.

<http://www1.eere.energy.gov/femp/financing/espcs.html>

▣ Case studies available online at http://www1.eere.energy.gov/femp/financing/espcs_casestudies.html



The screenshot shows a web browser window displaying the Federal Energy Management Program (FEMP) website. The page title is "Federal Energy Management Program: Department of Energy's Energy Savings Performance Contracts". The URL in the address bar is "http://www1.eere.energy.gov/femp/financing/superespcs_indianaff.html". The website header includes the U.S. Department of Energy logo and the text "Energy Efficiency and Renewable Energy". The main navigation bar lists "About the Program", "Program Areas", "Laws & Regulations", "Information Resources", "Financing Mechanisms", "Technologies", "Services", and "Home". The "Financing Mechanisms" section is highlighted in green. Below this, there is a sidebar with links for "Energy Savings Performance Contracts", "Assistance & Contacts", "Resources", "Laws & Regulations", "Energy Service Companies", "Awarded Contracts", "Case Studies", "Utility Energy Services Contracts", and "Energy Efficiency Incentive Programs". The main content area features a headline: "Department of Energy's Energy Savings Performance Contracts Stretch Budgets at the Bureau of Indian Affairs". Below the headline is an "Overview" section with text describing the U.S. Department of the Interior's Bureau of Indian Affairs' efforts to reduce energy costs and install renewable energy systems. A photograph of a photovoltaic energy system on a roof is shown, with a caption stating: "This photovoltaic energy system should provide nearly 7 kilowatts of clean solar electricity to the Sherman Indian High School campus." A "Printable Version" link is visible next to the headline.

Alternative Finance Options

Utility Energy Service Contracting

Utility Energy Service Contracting

- ▣ Similar process as ESPC
- ▣ Utility replaces role of ESCO
- ▣ Savings guarantees are negotiated, but not mandatory
- ▣ On-bill financing



Fort Knox's Army Ireland Hospital represented a major conservation project involving a \$4.8 million boiler-chiller replacement.



Geothermal heating and cooling was installed in some buildings to save energy at the base.

Utility Energy Service Contracting

- Case Studies and additional resources available online at http://www1.eere.energy.gov/femp/financing/uesc_case_studies.html

The screenshot shows a Windows Internet Explorer browser window displaying the Federal Energy Management Program (FEMP) website. The address bar shows the URL: http://www1.eere.energy.gov/femp/financing/uesc_case_studies.html. The page header includes the U.S. Department of Energy logo and the text "Energy Efficiency and Renewable Energy" with the tagline "Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable". The main navigation menu includes "About the Program", "Program Areas", "Laws & Regulations", "Information Resources", "Financing Mechanisms", "Technologies", "Services", and "Home". The "Financing Mechanisms" section is highlighted, and the "UESC Case Studies" page is displayed. The page content includes a sidebar with "Energy Savings Performance Contracts", "Utility Energy Services Contracts", and "Energy-Efficiency Incentive Programs". The main content area features a "Printable Version" link and a list of case studies, including "National Institutes of Health Showcases UESCs—Video Case Study", "Comprehensive Energy Program at Patrick Air Force Base Set to Exceed Energy Goals (PDF 709 KB)", "Energy Efficiency Upgrades for Fermilab Infrastructure", "Energy Efficiency Upgrades for Little Rock AFB", "Energy Efficiency Solution for the Chet Holifield Federal Building (PDF 155 KB)", "Fort Knox Strikes Energy-Savings Gold in Partnership with Utility", "GHPs Improve Housing and Save Energy at Camp Lejeune (PDF 1.8 MB)", "Innovative Utility Partnership at Fort Lewis, Washington (PDF 143 KB)", "Partnerships with the U.S. Postal Service (PDF 146 KB)", "Thermal Energy Storage at a Federal Facility (PDF 143 KB)", "Total-Solutions Approach at White Sands Missile Range (PDF 155 KB)", and "Utility Energy Service Contracting Boosts Mission Support for NASA (PDF 948 KB)".

Federal Energy Management Program: UESC Case Studies - Windows Internet Explorer

http://www1.eere.energy.gov/femp/financing/uesc_case_studies.html

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Federal Energy Management Program: UESC Case St...

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FEMP

EERE Home

Federal Energy Management Program

About the Program Program Areas Laws & Regulations Information Resources Financing Mechanisms Technologies Services Home

Financing Mechanisms

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EERE Information Center

Energy Savings Performance Contracts

Utility Energy Services Contracts

Types of Contracts
Getting the Best Value
Federal Utility Partnership Working Group
Case Studies
Resources
Contacts

Energy-Efficiency Incentive Programs

UESC Case Studies

Here you'll find case studies about the successful use of Utility Energy Service Contracts (UESCs) by federal agencies. Some of the following documents are available as Adobe Acrobat PDFs. [Download Adobe Reader.](#)

- [National Institutes of Health Showcases UESCs—Video Case Study](#)
- [Comprehensive Energy Program at Patrick Air Force Base Set to Exceed Energy Goals \(PDF 709 KB\)](#)
- [Energy Efficiency Upgrades for Fermilab Infrastructure](#)
- [Energy Efficiency Upgrades for Little Rock AFB](#)
- [Energy Efficiency Solution for the Chet Holifield Federal Building \(PDF 155 KB\)](#)
- [Fort Knox Strikes Energy-Savings Gold in Partnership with Utility](#)
- [GHPs Improve Housing and Save Energy at Camp Lejeune \(PDF 1.8 MB\)](#)
- [Innovative Utility Partnership at Fort Lewis, Washington \(PDF 143 KB\)](#)
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- [Total-Solutions Approach at White Sands Missile Range \(PDF 155 KB\)](#)
- [Utility Energy Service Contracting Boosts Mission Support for NASA \(PDF 948 KB\)](#)

Internet 100%

Helpful Resources

Helpful Resources

M&V Guidelines: Measurement and Verification for Federal Energy Projects

Version 3.0



www.eere.energy.gov/femp



U.S. Department of Energy
**Energy Efficiency
and Renewable Energy**
Bringing you a prosperous future where energy
is clean, abundant, reliable, and affordable

Section 4

Detailed M&V Methods

4.1 OVERVIEW OF M&V OPTIONS A, B, C, AND D

The measurement and verification (M&V) protocol mandated for projects conducted under the Super Energy Savings Performance Contract (Super ESPC) is the Federal Energy Management Program (FEMP) M&V Guidelines: Measurement and Verification for Federal Energy Projects. The FEMP Guidelines are an application of the International Performance Measurement and Verification Protocol¹ (IPMVP). Both of these guidelines group M&V methodologies into four general categories: Options A, B, C, and D. The options are generic M&V approaches for energy and water saving projects.

M&V approaches are divided into two general types: retrofit isolation and whole-facility. Retrofit isolation methods look only at the affected equipment or system independent of the rest of the facility; whole-facility methods consider the total energy use and de-emphasize specific equipment performance. One primary difference in these approaches is where the boundary of the energy conservation measure (ECM) is drawn, as shown in Figure 4-1. All energy used within the boundary must be considered. Options A and B are retrofit isolation methods; Option C is a whole-facility method; Option D can be used as either, but is usually applied as a whole-facility method.

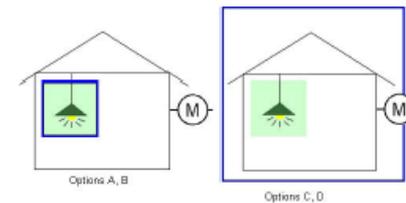


Figure 4-1 Retrofit Isolation (Options A and B) vs Whole-Facility M&V Methods (Options C and D)

The four generic M&V options are summarized in Table 4-1 and described in more detail below. Each option has advantages and disadvantages based on site-specific factors and the needs and expectations of the agency (see Chapter 5). While each option defines an approach to determining savings, it is important to realize that savings are not directly measured, and all savings are estimated values. The accuracy of these estimates, however, will improve with the number and quality of the measurements made. Although not required in Super ESPC projects, the accuracy of savings estimates can be quantified, as discussed in Section 5.4.

¹ *International Performance Measurement and Verification Protocol: Concepts and Options for Determining Energy and Water Savings Volume I*, EVO-10000 -1.2007, Efficiency Valuation Organization.

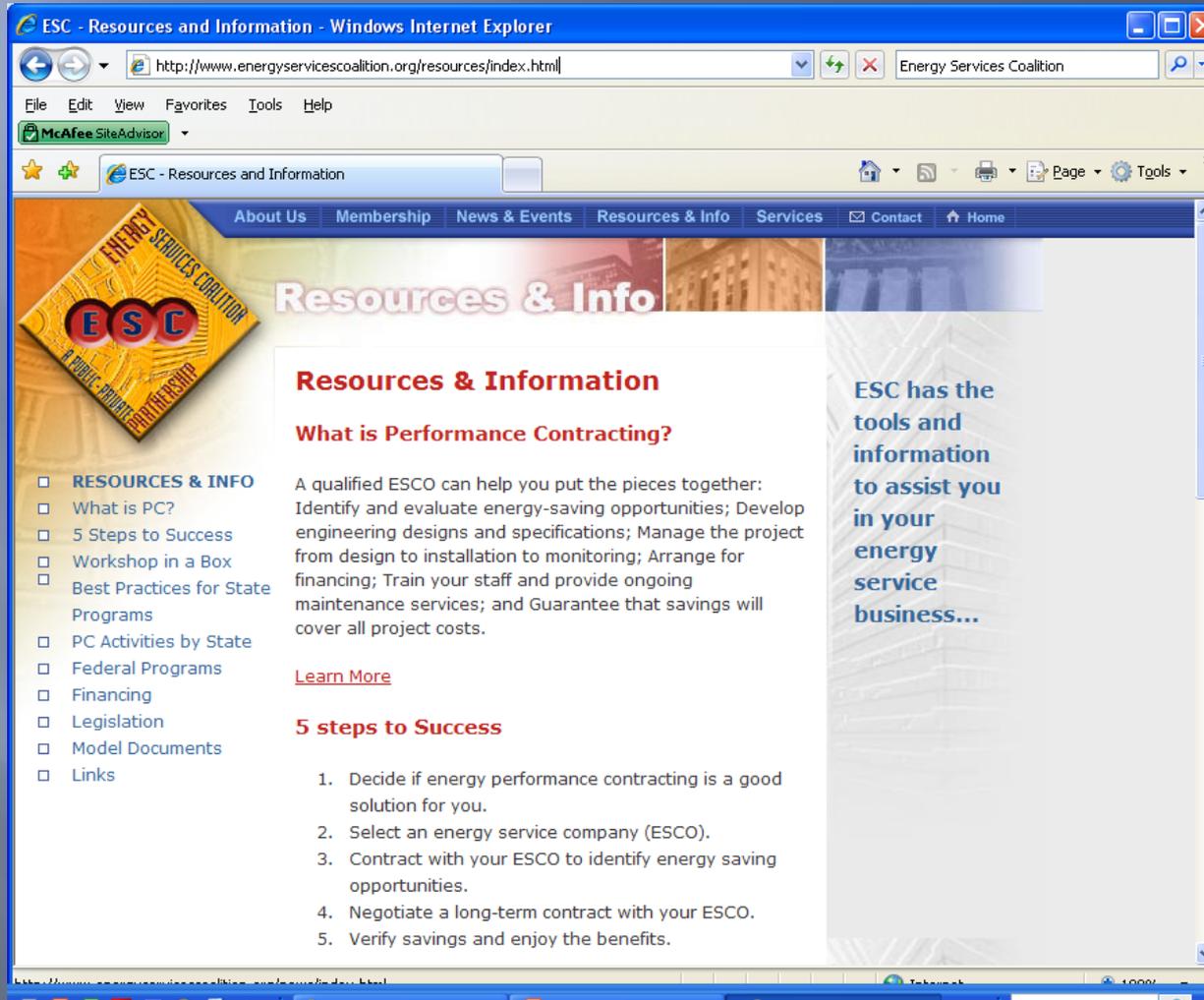
- http://www1.eere.energy.gov/femp/financing/esp_cs_resources.html

Helpful Resources (cont.)

The screenshot shows a web browser window titled "State Energy Program: Case Studies by State - Windows Internet Explorer". The address bar contains the URL http://apps1.eere.energy.gov/state_energy_program/case_studies_state.cfm. The page features a green header with the text "State Energy Program" and a navigation menu with links for "About the Program", "Projects by State", "Projects by Topic", "Information Resources", and "Home". The main content area is titled "Projects by State" and includes a sidebar with links for "All SEP Projects in the States & U.S. Territories", "Formula Grants by State", "Special Projects by State", "Case Studies by State", and "State Energy Office Project Briefs". The main text area is titled "Case Studies by State" and contains the following text: "Select a state or U.S. territory on the map or from the pull-down menu below for links to case studies published by states or the U.S. Department of Energy. These case studies examine in depth how a state is approaching a particular energy policy or is promoting the adoption of a specific renewable energy or energy efficiency technology. Or you can browse a list published by DOE's State Energy Program ([SEP case studies](#))." Below the text is a map of the United States with state abbreviations and a "Select a State" dropdown menu.

□ http://apps1.eere.energy.gov/state_energy_program/case_studies_state.cfm

Helpful Resources (cont.)



The screenshot shows a Windows Internet Explorer browser window displaying the Energy Services Coalition website. The address bar shows the URL: <http://www.energyservicescoalition.org/resources/index.html>. The website features a navigation menu with links for About Us, Membership, News & Events, Resources & Info, Services, Contact, and Home. The main content area is titled "Resources & Info" and includes a section for "Resources & Information" with a sub-section "What is Performance Contracting?". This section provides a definition of performance contracting and lists five steps to success. A sidebar on the left contains a list of resources, and a vertical banner on the right promotes the coalition's tools and information.

Resources & Information

What is Performance Contracting?

A qualified ESCO can help you put the pieces together: Identify and evaluate energy-saving opportunities; Develop engineering designs and specifications; Manage the project from design to installation to monitoring; Arrange for financing; Train your staff and provide ongoing maintenance services; and Guarantee that savings will cover all project costs.

[Learn More](#)

5 steps to Success

1. Decide if energy performance contracting is a good solution for you.
2. Select an energy service company (ESCO).
3. Contract with your ESCO to identify energy saving opportunities.
4. Negotiate a long-term contract with your ESCO.
5. Verify savings and enjoy the benefits.

Resources & Info

- RESOURCES & INFO
- What is PC?
- 5 Steps to Success
- Workshop in a Box
- Best Practices for State Programs
- PC Activities by State
- Federal Programs
- Financing
- Legislation
- Model Documents
- Links

ESC has the tools and information to assist you in your energy service business...

- <http://www.energyservicescoalition.org/resources/index.html>

Helpful Resources (cont.)

The screenshot shows a Windows Internet Explorer browser window displaying the NAESCO website. The address bar shows the URL <http://www.naesco.org/default.htm>. The website header includes the NAESCO logo and the text "National Association of Energy Service Companies". A navigation menu on the left lists various sections such as "About NAESCO", "Membership Snapshot", "Finding a Provider", "NAESCO Membership", "Accreditation Programs", "Events", "Policy Priorities", "News", "Resources", "Bookstore", and "Jobs". The main content area features a large photograph of the University of Missouri-Kansas City Burns & McDonnell building. Below the photo, there is a section titled "NAESCO THANKS ITS 2009 ANNUAL SPONSORS" with logos for Platinum sponsors (Chevron Energy Solutions) and Gold sponsors (Applied Energy Management, ConEdison Solutions, Pepco Energy Services, Siemens Building Technologies, and Sverny Companies). A text block describes NAESCO as a national trade association promoting energy efficiency. A "NAESCO NEWS" sidebar on the right lists recent news items, including a "Mid-Atlantic Regional Meeting" in Philadelphia, "DOE Announces 16 New IDIQ ESPC Awards", and a report on "Non-Energy Benefits of ESCO Projects".

□ <http://www.naesco.org/default.htm>

Helpful Resources (cont.)

The screenshot shows a Windows Internet Explorer browser window displaying the DSIRE website. The address bar shows the URL <http://www.dsireusa.org/>. The website has a navigation menu at the top with links for NC Solar Center, IREC, Contacts, About Us, and NCSU. The main content area features the DSIRE logo and a description: "DSIRE is a comprehensive source of information on state, local, utility, and federal incentives that promote renewable energy and energy efficiency. Choose one or both databases to search:". Below this, there are two checked checkboxes for "Renewable Energy" and "Energy Efficiency". A map of the United States is shown, with a small inset map of the United States labeled "FED" and "Federal Incentives". The main map shows state abbreviations. A sidebar on the left contains links for FAQs, Summary Maps, Summary Tables, Search By, Glossary, Links, Library, and New / Updated Incentives. The footer of the page indicates "Last Updated: 04/15/09". The browser's status bar at the bottom shows the URL <http://www.dsireusa.org/aboutus.cfm>, the Internet icon, and a zoom level of 100%.

□ <http://www.dsireusa.org/>

Helpful Resources (cont.)

The screenshot shows a Windows Internet Explorer browser window displaying the Western Area Power Administration website. The address bar shows the URL <http://www.wapa.gov/>. The website header includes the WAPA logo and the text "Serving the West with Federal hydropower" and "Western Area Power Administration". Below the header is a navigation menu with links for Home, About Western, Power Marketing, Transmission, Jobs, EPTC, Energy Services, Corp. Services, Regions, Doing Business, Newsroom, Industry Links, and Federal Register Notices. The main content area features a "Hot topics" sidebar on the left, a central article titled "Federal agencies offered easy tool to go 'greener'", a "Public meeting on Transmission Infrastructure Program" section, and a "Western proposes transmission program, seeks projects" section. A "Quick picks" sidebar on the right lists various resources like "Public involvement", "2007 Annual Report", and "Crime Watch program". A search bar is located in the top right corner. The browser's taskbar at the bottom shows several open applications.

□ <http://www.wapa.gov/>

Helpful Resources (cont.)

The screenshot shows a Windows Internet Explorer browser window displaying the Defense Energy Support Center website. The browser's address bar shows the URL <http://www.desc.dla.mil/default.asp>. The website header features the Defense Energy Support Center logo, the text "DEFENSE ENERGY SUPPORT CENTER" and "★ TOTAL ENERGY SOLUTIONS", a search bar, and links for "Directions" and "Weather". A navigation menu includes "Home", "About DESC", "Customer Resources", "Vendor Resources", "Supply Chain Management", "Policies / Publications", "Contact Us", and "Links". Below the menu is a banner with four images: a fighter jet, an eagle, a technician, and a soldier. The main content area is divided into sections: "★ Fuel Line Publication" with a thumbnail of the Fuel Line magazine and a description; "★ Products & Services" with a photo of technicians and a text block; "★ Solicitations"; and "★ News and Events". The browser's status bar at the bottom shows "Internet" and "100%" zoom.

□ <http://www.desc.dla.mil/default.asp>

Helpful Resources (cont.)

The screenshot shows a Windows Internet Explorer browser window displaying the NREL website. The address bar shows the URL http://www.nrel.gov/applying_technologies/working_with.html. The page features the NREL logo and navigation menu. The main content area is titled 'Working with Us' and includes sections for 'Developing a Technology Partnership', 'Licensing a Technology', and 'Using Our Facilities'. A sidebar on the left lists various resources like 'Capabilities', 'Modeling & Tools', and 'Training'.

NREL: Applying Technologies - Working with Us - Windows Internet Explorer

http://www.nrel.gov/applying_technologies/working_with.html

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NREL: Applying Technologies - Working with Us

NREL National Renewable Energy Laboratory
Innovation for Our Energy Future

NREL HOME

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Applying Technologies

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Site Map

Applying Technologies Home

Capabilities

Modeling & Tools

Training

Project Assistance

Partnerships

Working with Us

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Publications

News

Working with Us

NREL works closely with industry, governments, organizations, research institutions, and universities and colleges. These collaborative efforts are key to moving clean energy technologies into the marketplace and promoting their use.

We share our technical expertise and [capabilities](#) by providing opportunities to:

- Develop technology partnerships
- License our technologies
- Use our facilities.

Developing a Technology Partnership

NREL offers a variety of [technology partnership agreements](#) to help you gain access to our research expertise and capabilities. You can:

- Work collaboratively with us on a project through a [Cooperative Research and Development Agreement](#).
- Pay NREL to conduct research without your collaboration through a [Work-for-Others](#) agreement.

Licensing a Technology

Your company can [license](#) NREL-developed technologies, many of which have been patented.

Using Our Facilities

NREL's world-class laboratory [facilities](#) are available to industrial, university, and government researchers.

□ http://www.nrel.gov/applying_technologies/working_with.html

Helpful Resources (cont.)

The screenshot shows the ASHRAE website in a Windows Internet Explorer browser window. The address bar shows <http://www.ashrae.org/>. The browser title is "ASHRAE - Windows Internet Explorer". The website header includes the ASHRAE logo, the tagline "Advancing HVAC&R to serve humanity and promote a sustainable world", and navigation links: "About Us | Press Room | My ASHRAE | Contact Us | Site Map". A search bar is present with the text "Enter your search" and "Go!". Below the header is a navigation menu with categories: "Membership", "Publications", "Technology", "Certification", "Education", "Events", "StudentZone", and "Advocacy".

The main content area is titled "American Society of Heating, Refrigerating and Air-Conditioning Engineers". It features a large image of Earth and the text: "About ASHRAE The American Society of Heating, Refrigerating and Air-Conditioning Engineers advances technology to serve humanity and promote a sustainable world. Membership is open to any person associated with the field. [Click here to join ASHRAE](#) Click here to see the value of ASHRAE membership".

On the left side, there is a "Login" section with fields for "E-mail" and "Password", a "Submit" button, and links for "Need a login?" and "Can't login?". Below this is a "Member Central" section with a list of links: "Renew Membership", "Read ASHRAE Journal", "Login to the Bookstore", "Career Services", "Change Your Address", "Change Your Password", "Get Involved", "Update Your Bio", "Research Reports", "Abstract Archives", and "Contact Staff".

The main content area is divided into several sections:

- ASHRAE 2009 Annual Conference June 20-24, Louisville, KY**: Includes an image of a horse and rider and the text: "ASHRAE rolls into Louisville June 20-24 for the 2009 Annual Conference. [Learn more](#) about the technical program, tours and your chance to visit Churchill Downs."
- Register for ASHRAE's 2009 Spring Online Series**: Includes an image of a person at a computer and the text: "Engage in real-time learning, interact with peers and instructors, and learn from the comfort of your own office with ASHRAE Learning Institute's online courses. [Learn More](#)"
- Resources for Stimulus Spending**: Includes an image of the US Capitol and the text: "With passage of stimulus legislation, states and localities are seeking assistance on energy saving projects. Resources for"
- Attend ASHRAE's Satellite Broadcast on IAQ**: Includes an image of a person at a computer and the text: "Join ASHRAE in learning more about transforming mid-range practice into best practice for healthy, productive, sustainable"

On the right side, there is a "News" section with several articles:

- 4/15 [ASHRAE Provides Federal Recovery Act Resources](#)
- 4/13 [Re-Engineering the Past: Congressional Briefing Held on High-Performing Historic Buildings](#)
- 3/31 [Stimulus Funding for Schools Provides Energy Efficiency Opportunities](#)
- 3/24 [ASHRAE Launches Commissioning Certification Program](#)

At the bottom right, there is a "ASHRAE Conference Sponsor" section with an image of a building and the text: "partner in ASHRAE Headquarters renewal".

□ <http://www.ashrae.org/>

Resources

Shah, C., Kelley, J., Ziesler, J. and McAndrew, D. *Introduction to Alternative Finance for Energy Efficiency and Renewable Energy Technology.* (2009, February). Technical Presentation . US Dept of Energy, Federal Energy Management Program. Retrieved February 25, 2009. <http://eere.energy.gov/>

Questions?

Thank You
for Your Attention

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National Renewable Energy Laboratory