How Energy Savings Performance Contracting Can Support State Climate and Energy Planning

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U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

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This short presentation is intended give states and their stakeholders a vision for what it would look like to include energy savings performance contracting in their climate and energy plans.

Energy Savings Performance Contracting as an Emissions Reduction Approach

Possible Leads

- State Energy Office
- State/Local General Services
- Local Sustainability Office
- Commercial building owner
- Energy savings company (ESCO)

E-Savings

- Annual kWh reduced since project installation date

Potential Program Components

- Green Bank or other internal state/city funding
- Utility
- State ESPC Support Program

Potential Savings in 2030
45-90 million MWh
26-51 million short tons CO_2

Activities	EM&V
Energy Savings Approaches	
• State energy or general services office, building owners, ESCOs, utilities generate energy savings from: - Direct energy management - Capital improvements - Technical assistance - Training - Metering - Utility incentives	Recent resources provide guidance, including: - *Federal Energy Management Program M&V Guidelines Version 4.0*
State Policy Options	
• Could include: - Energy efficiency resource standard (EERS) - Executive Order or legislation to create ESPC program w/target savings or investments - State financing for ESPC projects - State admin. rules to support ESPCs	
Low-Income Opportunities	
• Energy savings projects in low-income neighborhoods (e.g., schools, community centers, facilities, multifamily housing)	

Why Energy Savings Performance Contracting?

How Energy Savings Performance Contracting (ESPC) Works

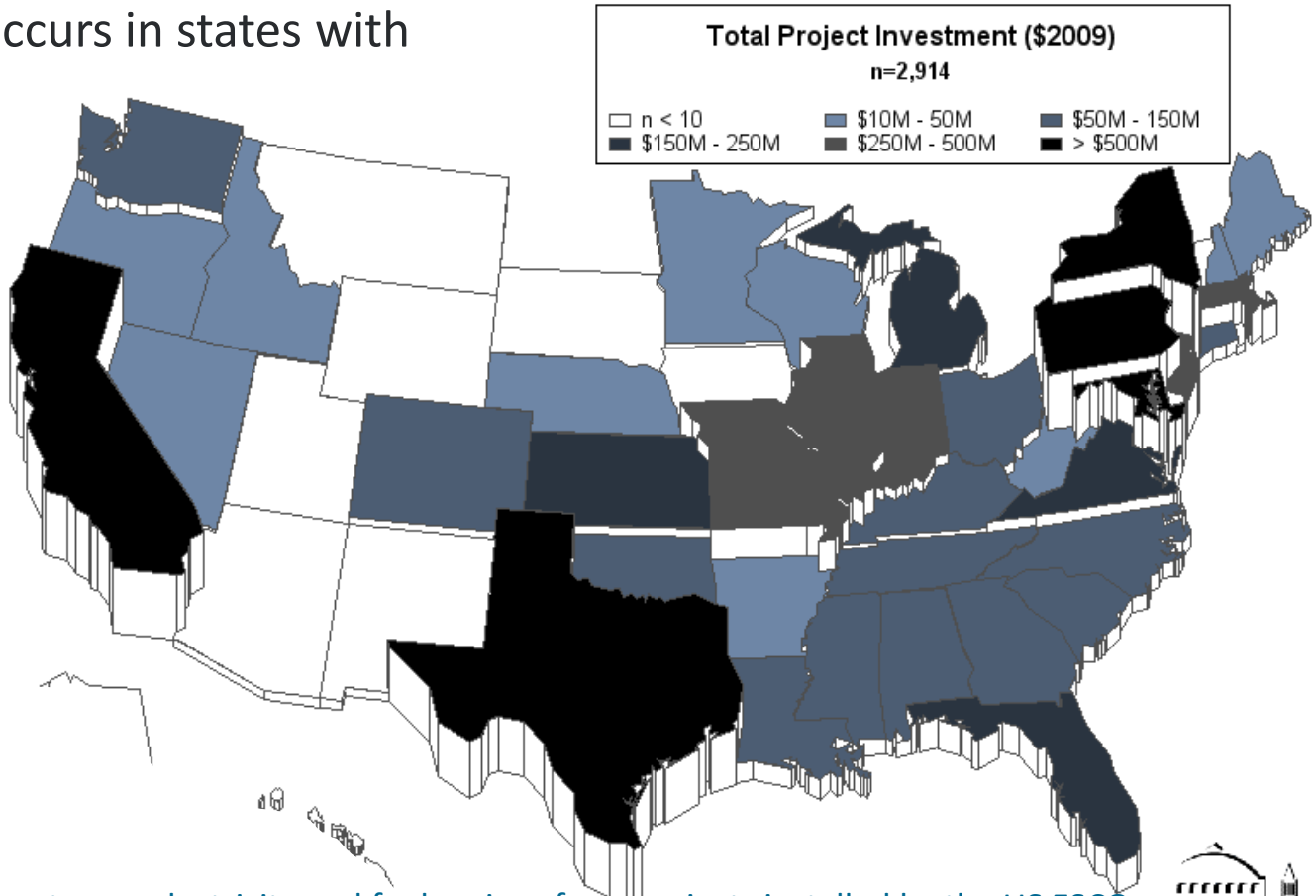
- ESPC is typically performed by an energy savings company (ESCO) that implements the contract by providing a series of services in a turnkey approach.
- ESPC is a mechanism that provides upfront capital for energy efficiency projects that is repaid to the ESCO by the energy savings generated by the project.
- ESPC mobilizes energy efficiency projects that might not otherwise move forward in the face of limited budgets for upfront project costs.
- ESPC enables more comprehensive retrofits that can include major energy-consuming equipment upgrades as well as water conservation and infrastructure improvements.

Benefits of ESPC

- Guaranteed project performance: ESCOs are responsible for any shortfall in guaranteed project savings.
- A typical ESPC project in the municipal/university/schools/hospitals (MUSH) market saves approximately 13-31% annually, compared to its baseline consumption.[2]
- ESPCs active in 2012 saved 34 million TWh and 224 million MMBtu or approximately 1% of total US commercial building energy consumption[1]

Current Status of ESPC

- Nearly all states have ESPC-enabling legislation
- State and local governments, universities/colleges, schools, and healthcare facilities represent about 70% of industry revenues; 15% is in the commercial/industrial and public housing sectors
- More ESPC activity occurs in states with energy savings goals



Sources: LBNL, 2015, Estimating customer electricity and fuel savings from projects installed by the US ESCO industry; LBNL, 2013, Current Size and Remaining Market Potential of the U.S. Energy Service Company Industry; ORNL accessed March 2, 2016, Performance Contracting by State

State and Local Role in ESPC

ESPC pathway requires state and local action

- Legislation enabling ESPC is adopted at the state level; nearly all states have legislation allowing ESPC.
- State and local debt and financing policy impacts ESPC project structures.
- Decision or approval to use ESPC is made at the individual state or local agency, department, council, or facility level.

Policy Actions

- The most effective state-level ESPC policy includes establishing a state-led program to provide technical assistance to entities pursuing ESPC projects.
- A state legislature, governor, admin agency, or local gov't can support ESPC by:
  - Establishing or leveraging a statewide savings goal
  - Establishing or leveraging an energy savings goal or EE standard specific to state or local building stock (often set by the governor or local elected official)
  - Establishing training or certification programs/requirements for building operators
  - Establishing or accessing an internal financing mechanism that can provide a regular, low-cost funding stream for ESPC projects
  - Establishing a state chapter of the Energy Services Coalition; chapter meetings bring together public and private ESPC stakeholders.

Best Practices in ESPC Implementation

Implementation Actions

- Sound project development and implementation are critical to realizing actual energy savings from ESPC projects.
- Some states use in-house expertise to develop ESPC projects for public facilities; others look to external support, such as owner's agents.

- Best practices in project implementation include:
  - Engage an owner’s agent to oversee project development and management
  - Partner with ESCOs pre-qualified to perform the project
  - Use standardized contracts and documents to streamline the project development process and cut transaction costs
  - Plan and apply formal measurement & verification (M&V) and third-party verification to ensure project is yielding the expected savings
  - Manage projects to ensure project performance meets expectations
    - Includes efforts to benchmark, track, and report project data

National Electricity Savings Estimates

Current: In 2012, ESPC projects produced about 34 million MWh of savings from:

- All projects actively in operation that are still producing annual electricity savings
- Savings from projects installed only in 2012 were approximately 2.3 million MWh

Future: In 2030, ESPC could produce 45 to 90 million MWh and 26-51 million short tons CO_2 of savings if:

- The energy savings performance contracting industry grew 0 to 8% annually in volume of ESCO projects after 2012

Sources: LBNL, 2015, Estimating customer electricity and fuel savings from projects installed by the US ESCO industry; LBNL, 2014, A method to estimate the size and remaining market potential of the U.S. ESCO industry; EPA eGRID 2012

ESPC Savings Examples from Select States

- For over 25 years, **Washington**'s Dept. of Commerce has contracted with ESCOs to make energy-savings investments in more than 400 public facilities, with average annual savings of over $30 million. The program has saved an average of 1 trillion BTUs and 58.8 tons of CO_2 per year.

- Since the mid-1990s, **Colorado**'s Energy Office has partnered with ESCOs to make energy-saving improvements to 182 public facilities, saving an average of $28.8 million in utility costs and 141.8 million kWh of electricity per year.
  - In 2014, the state began piloting an ESPC program for 27 non-public commercial buildings.

- Since 2005, **Illinois**' Department of Commerce and Economic Opportunity has helped arrange ESPC for local governments and other public facilities. The program, which built on a pilot, has achieved utility savings of over $17.2 million per year.

- Since 2002, 183 local **Massachusetts** government bodies (municipalities, schools) used ESPC to achieve energy cost savings of $17.8 million annually.
  - Since 2012, the Department of Administration and Finance and Department of Energy Resources have secured $470 million of ESPC investment in 58 million ft^2 of state buildings, resulting in a 25% energy reduction and a decrease in GHG emissions of 135,000 metric tons.

- Since 2009, **New Jersey**'s Board of Public Utilities' has helped arrange ESPC for 65 projects at public facilities. The program has realized annual energy savings of $40 million.

ESPC Is Cost-Effective

- ESPC does not require up-front investment from a state or local government to complete projects.
  - ESCOs provide investment capital and an energy savings guarantee for the project. With a properly set-up project and contract, the ESCO bears the costs of any shortfall if project savings do not materialize.

- ESPC projects register 15-31% energy savings per project.[1]

- The average ESPC project in the state and local market pays back its investment in approximately 8-10 years.[2]
  - These payback periods are often appropriate for comprehensive building upgrades (HVAC, weatherization), which offer greater energy savings but take more time to complete.
  - For example, Connecticut statute defines cost-effective [in relation to building retrofits] as an aggregate payback ≤ 15 years.[3]

[1] LBNL, 2013, Current Size and Remaining Market Potential of the U.S. Energy Service Company Industry

[2] LBNL ESPC Project Performance Benchmarking Sheet: State & Local Governments, c. 2010

[2] Connecticut's Standardized ESPC Program, Department of Energy and Environmental Protection, Connecticut Green Bank, October 2015

EM&V Methods for ESPC

- ESPC contracts typically require quantification of energy savings; these occur on a project-by-project basis (M&V).

- ESCOs use standardized M&V approaches, primarily the International Performance Measurement and Verification Protocol (IPMVP).
  - It provides four M&V options and addresses issues related to the use of M&V in third-party-financed and utility projects. Best practice is to add third-party verification to ESCO measurement.

- Other options include:
  - DOE FEMP (Federal Energy Management Program) M&V Guidelines – Many state & local governments use these Guidelines, which contain specific procedures for applying concepts originating in the IPMVP.
  - ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) Guideline 14 – Measurement of Energy and Demand Savings -- The ASHRAE guideline specifies three engineering approaches similar to the options provided in IPMVP.
  - DOE Uniform Methods Project – These include specific protocols based on the type(s) of measures included in the ESPC project.

DOE Support for ESPC

- Two program offices in DOE support the implementation and expansion of access to ESPC:
  - The Office of Weatherization & Intergovernmental Programs (WIP) works with state and local governments.
    - State & Local Solution Center includes:
      - ESPC model contract and companion documents
      - 5-module webinar training series on ESPC
      - ESPC state legislation database
      - ESPC fact and project benchmarking sheets
  - The Federal Energy Management Program works with federal government agencies (FEMP).
    - FEMP's M&V Guidelines 4.0

Additional Resources for State & Local Governments

- Individual states support ESPC programs. Start with the State Energy Office.

- Additional educational and informational resources are available through the Energy Services Coalition, a public-private partnership promoting the benefits of, providing education on, and serving as an advocate for the widespread use of energy performance contracting in public and private facilities.
  - ESC State Chapters
  - ESC Project Case Studies

- Additional Key Documents
  - *Current Size and Remaining Market Potential of the U.S. Energy Service Company Industry*
  - NAESCO ESPC Project Case Studies

On the Horizon

DOE will publish six new ESPC-related resources in 2016:

- *Energy Savings Performance Contracting Guidelines for Developing, Staffing, and Overseeing a State Program*
- *Performance-Based Contracting: A Primer for K-12 Schools*
- *Energy Savings Performance Contracting for Wastewater Treatment Facilities*
- Decision trees for ESPC financing options and data tracking tools
- Transition toolkit for state and local managers & elected officials

Get More Information on This Pathway and Others

Visit: energy.gov/eere/slsc/EEopportunities

How Energy Efficiency Programs Can Support State Climate and Energy Planning

Overview and individual presentations on features and benefits associated with including energy efficiency in climate and energy plans, covering:

- National electricity savings potential estimates for 2030
- Current activity at the national and state levels, best practices, energy savings examples, cost-effectiveness, measurement approaches, and DOE support for:
  - Building energy codes
  - City-led efficiency efforts
  - Combined heat and power
  - Energy savings performance contracting
  - Industrial efficiency, including superior energy performance
  - Low income energy efficiency
  - Ratepayer-funded programs
- Technical assistance available

Guide for States: Energy Efficiency as a Least-Cost Strategy to Reduce Greenhouse Gases and Air Pollution, and Meet Energy Needs in the Power Sector

State and Local Energy Efficiency Action Network (SEE Action) resource presents pathways thru:

- Case studies of successful regional, state, and local approaches
- Resources to understand the range of expected savings from energy efficiency
- Common protocols for documenting savings
- Sources for more information