U.S. DEPARTMENT OF ENERGY

Office of ENERGY EFFICIENCY & RENEWABLE ENERGY

Energy Savings Performance Contracting: Improving Infrastructure & Turning Waste into Wins

Market conditions have created the perfect storm for a powerful solution – Energy Savings Performance Contracting (ESPC). ESPC is a contracting and financing method that provides upfront financing for energy efficiency projects that is then repaid over time by the cost savings resulting from the upgrades. This budget-neutral approach saves taxpayers money by cutting energy and water waste and saving those operating funds for other priorities. Public-sector organizations facing aging infrastructure, rising energy costs, and limited budgets can redirect those dollar savings toward critical "lead-by-example" building and infrastructure improvements.

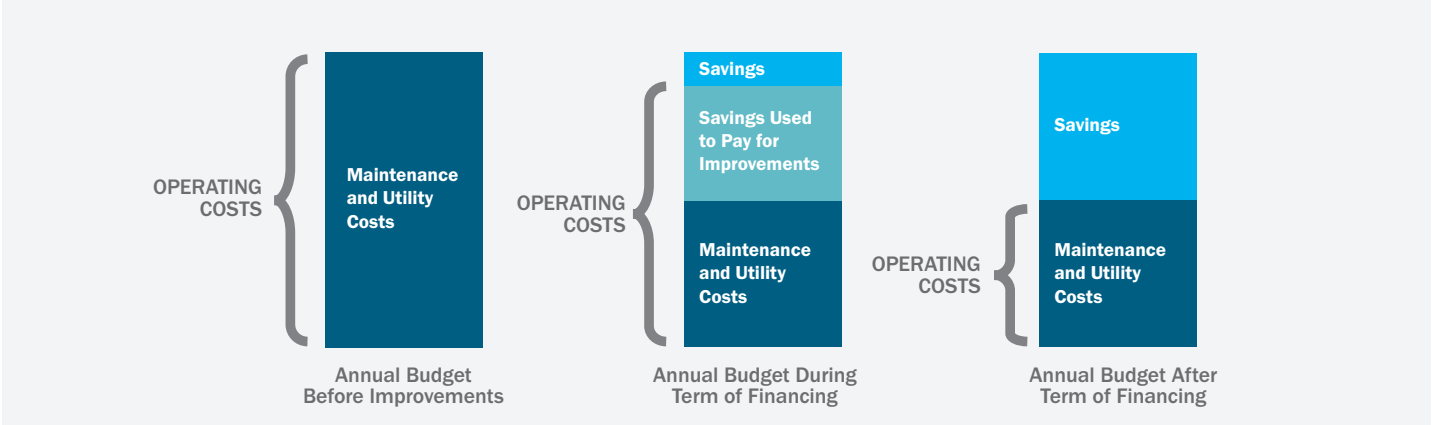
Why Performance Contracting?

Performance contracting offers many economic benefits and a long, reliable energy savings track record. Under tight capital budgets, the upfront financing available through ESPC enables more retrofit projects to move forward than might otherwise. All ESPC projects active in 2012 reduced total US commercial building energy consumption by about 1 percent or 224 MMBtu,[3] thus reducing utility and other operational costs and the associated taxpayer burden. The savings can then be used to pay for infrastructure investments. Large-scale ESPC projects support economic development by creating jobs and spurring local investment in materials and equipment. Some ESCOs report anecdotally that as much as 70 percent of ESPC project costs remain in the community.[4]

Building owners can also use ESPC to support facility priorities like addressing deferred maintenance, managing increasing energy costs, streamlining ongoing operations and maintenance of their facilities, and integrating energy security and resiliency. Individual ESPC projects in the MUSH (municipalities, universities, schools, and hospitals) market, each typically worth about $3 million since 2012,[5] have demonstrated energy savings of 13% to 31%.[6] The cornerstone of ESPC, the performance guarantee, offers project owners peace of mind, because the Energy Service Company (ESCO) assumes project risk and guarantees the resulting savings, even reimbursing the difference or fixing the problem at no additional cost.

Infrastructure Improvements Save More Than Just Energy

ESPC projects can yield benefits beyond just energy savings, like avoided operations & maintenance expenditures, increased occupant productivity, health and comfort, and reduced air pollution. Research has shown gains of 6-26% in "occupant performance" in various groups, such as students learning in schools, employees working in commercial offices, or consumers spending in retail venues.[7] Building retrofits that improved the indoor environment of a building have reduced instances of communicable respiratory diseases by 9-20% and allergies and asthma by 18-25%, and other health and discomfort by 20-50%.[8] The U.S. Green Building Council estimates that if half of new commercial buildings were built to use 50% less energy, it would save over 6 million metric tons of CO_2 annually for the life of the buildings – the equivalent of taking more than 1 million cars off the road every year.[9]



The ESPC Market

The use of performance contracting has trended up in recent years, with MUSH projects representing almost two-thirds of all ESPC projects and federal projects another 21 percent.[10] The projects below are just a sample of the many successful ESPC projects carried out in the last several years:

University of Kentucky

Total Cost: $24.7 million
Project Description: Comprehensive retrofit of 61 campus buildings totaling 5.2 million sq. ft.

ANNUAL SAVINGS	$2.4 MILLION

New Carrollton, MD Federal Facility

Total Cost: $40 million
Project Description: Deep-energy retrofit including HVAC, chilled water plant, rain gardens, solar PV, & geothermal system

ANNUAL SAVINGS	$2.5 MILLION / 60% BTU

Grand Rapids, MI Water Resource Recovery Facility

Total Cost: $1.9 million
Project Description: Variety of building envelope measures as well as an energy management system and an expanded & reworked energy recovery HVAC system

ANNUAL SAVINGS	$145 THOUSAND / 10% BTU

McKinley County, NM

Total Cost: $2.2 million
Project Description: Comprehensive retrofit of >40 county facilities totaling >350,000 sq. ft., including the courthouse & the adult detention center

ANNUAL SAVINGS	$334 THOUSAND / 18% BTU

ESPC Market Opportunity

In 2015, one-third or less of MUSH and federal agency floor area has been addressed by ESPC[11].

PROJECT INVESTMENT OPPORTUNITY[12]

MUSH MARKET
$66–208 BILLION

FEDERAL MARKET
$3–15 BILLION

ENERGY SAVINGS POTENTIAL[13]

MUSH MARKET
200–262 TRILLION BTU

FEDERAL MARKET
27–68 TRILLION BTU

Realizing the ESPC Market Opportunity

State and Local Governments

The U.S. Department of Energy's Better Buildings ESPC Accelerator was a three-year partnership with states, local governments, and K-12 schools to expand access to performance contracting. The Accelerator catalyzed public-sector energy efficiency investments of more than $2 billion from January 2013 to December 2016 and supported the use of innovative and best-practice approaches to enhance performance contracting programs into the future. DOE worked with 25 state and local organizations to develop solutions to the most common barriers impeding ESPC: streamlining the ESPC process, empowering project owners with data, building a national ESPC framework, and using innovative approaches for applying ESPC in new market sectors.

Federal Agencies

In the previous five years starting in fiscal year 2012, federal agencies awarded 340 projects with an investment value of more than $4 billion. These infrastructure upgrades will reduce energy-related spending in the federal government by $8 billion over the next 18 years and create more than 30,000 jobs. Federal agencies continue to develop new projects and targets are listed in each federal agency's Strategic Sustainability Performance Plan. DOE will continue to support federal agencies with contracting and technical assistance, guidance, and training to help them install a variety of energy conservation measures, including new HVAC systems, LED lighting, building automation systems, and renewable energy installations.

ESPC Resources From DOE

DOE offers a collection of resources that federal, state, and local organizations have used to successfully implement and evaluate performance contracting. A few resource highlights include:

ESPC or Design-Bid-Build?

MARKET: State and Local

This illustrated fact sheet enables users to decide whether ESPC or design-bid-build is more suited to their planned retrofit project by comparing the development, management, and outcomes of each approach.

eProject Builder

MARKET: State, Local and Federal

This web-based data management tool provides consistent tracking and reporting of ESPC project data, enabling project owners to make the business case for ESPC, negotiate strong ESPC projects, and standardize project results reporting. All performance contracting market segments can use this national database.

ESPC Virtual Technical Assistant

MARKET: State and Local

This electronic guide walks users through the process of developing and implementing an ESPC project in five phases. A document version of this tool is also available that state and local governments can customize to their local ESPC practices and conditions and program into their own websites.

ESPC Toolkit

MARKET: State and Local

This collection of resources featured in the Better Buildings Solution Center will enable federal, state, and local communities to learn and benefit from the work of DOE's three-year ESPC assistance initiative for the MUSH market. It includes tools that states, cities, and K-12 schools have used to successfully implement and evaluate performance contracting.

ESPC Financing Decision Tree

MARKET: State and Local

A decision tree that enables users to select the form(s) of financing best suited to their jurisdiction's conditions.

ESCO Selector

MARKET: State, Local and Federal

This web-based tool creates a federally compliant notice of opportunity that meets agency needs and streamlines ESCO selection. It quickly generates an editable document that is easily tailored to specified requirements for federal projects and could be further edited to meet state and local project requirements.

ESPC Project Development Resource Guide

MARKET: Federal

This guide charts the ESPC process for providing project development support to agencies developing Energy Savings Performance Contract (ESPC) projects using the U.S. Department of Energy indefinite-delivery, indefinite-quantity ESPC.

M&V Process and Guidelines

MARKET: State, Local and Federal

The key factor of any ESPC is the measurement and verification (M&V) of savings which determines if the ESCO meets the guarantee. Three documents help MUSH and Federal market customers determine reasonable and acceptable guidelines for M&V of energy and operation and maintenance savings as well as the customer witnessing strategies to ensure verification of savings:

- M&V Guidelines: Measurement & Verification for Performance-Based Contracts
- How to Determine and Verify Operating and Maintenance Savings in Federal Energy Savings Performance Contracts
- Guide to Government Witnessing and Review of Measurement and Verification Activities

For more information on the ESPC Toolkit and other ESPC resources for state and local governments, contact

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For federal agencies, contact the Federal Project Executive covering your region.

Footnotes
https://energy.gov/eere/slsc/espc-fact-sheet-footnotes

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For more information, visit: energy.gov/eere/slsc

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