



Frequently Asked Questions about ESPC Strategy

1) What types of energy/water conservation measures (ECMs) are the most common in ESPCs?

The most common projects in ESPC are those centered on the energy consuming equipment in buildings: lighting, heating, ventilating and air conditioning (HVAC) equipment, electric motors, and the building energy management systems that control such equipment. Water conservation is important too, and water conservation measures can be very cost effective.

Projects also often involve systems in central plants that supply multiple buildings, such as chiller plants and boiler plants. A good example is the project at DOE's Savannah River Site, where two 30,000-lb-per hour steam boilers were constructed and replaced the existing coal-fired boilers. One new boiler is wood-fired and provides the majority of the steam required for the area. The other boiler is a stand-by fuel-oil-fired boiler which will operate during maintenance periods for the wood-fired boiler and during peak steam demand times. Annual environmental benefits of the \$13.8 million project include:

- Particulate matter reduction of 400 tons
- SO_x reduction of 1,742 tons
- NO_x reduction of 218 tons
- CO reduction of 10 tons

The table below shows the top ten ECMs in terms of energy savings and cost savings across ESPC IDIQ projects for the last year.

ECM	% of Reported Energy Savings	% of Reported Cost Savings
CHW/HTHW/Steam Distribution	21.3%	9.8%
Building Automation/Controls	16.8%	15.7%
HVAC	15.8%	15.6%
Boiler Plant Improvements	13.3%	11.0%
Lighting	11.9%	16.6%
Chiller Plant Improvements	5.7%	6.9%
Water and Sewer	5.4%	5.6%
GSHP	2.8%	3.0%
Renewables	1.3%	—
Motors and Drives	1.0%	—
Distributed Generation	—	6.8%
Advanced Metering Systems	—	2.2%

2) When do ESPCs make the most sense?

ESPC makes the most sense when facilities contain aging equipment that is nearing the end of its useful life, or when the buildings and central plant equipment have not received a major audit in some time. These types of facilities will contain the most opportunity for savings from replacing old equipment. There will be fewer opportunities for savings in newer buildings, or in buildings where much of the equipment has recently been upgraded. Newer equipment generally has higher efficiency, and it will also have many years of service left, so there is less economic benefit from replacing it.

3) What is the best strategy for getting the most out of an agency's appropriated funding for energy projects? Should I use all my appropriated funding to directly buy ECMs, or should I apply those funds to an ESPC as a "buydown"?

The use of appropriations in conjunction with ESPC is a very important consideration. Improper application of available appropriations is something that can reduce the effectiveness of an ESPC. The feasibility of ESPC depends on the opportunity for short-payback ECMs to balance the longer-payback ECMs. To maximize savings and minimize overall life-cycle cost, the best strategy is to use private financing (i.e., an ESPC or utility energy services project) to fund as many of the ECMs as possible within the statutory maximum 25-year project term, beginning with the ECMs with the shortest paybacks. To get the most from available appropriations, they should either be applied to a privately financed project as a one-time payment from savings (i.e., as a "buydown"), or used to directly fund longer-payback ECMs that cannot be included in the privately financed project.

Agencies sometimes want to do this the other way around: using their appropriations to directly fund shorter-payback ECMs like lighting and controls. This makes the remaining ECMs more costly to finance. In order to stay within the 25-year statutory term limit, the ESCO will usually have to reduce the level of investment by eliminating the ECMs with the longest paybacks – ECMs that could have remained in the project had the shorter-payback ECMs been included.

4) What are the keys to successful ESPC projects?

#1 – Teamwork and commitment to success and quality.

An ESPC is a long-term partnership between an ESCO and an Agency. The most successful projects are those that develop a strong plan from the beginning, and then both partners work to fulfill the plan. Agencies that put together a strong team, where both partners are motivated, engaged, and committed to developing a comprehensive energy project and operating the facility and buildings in the most efficient manner possible do well with this program.

FEMP provides numerous resources to ensure agency success, such as offering on-site training, multi-day training, and support from a trained Project Facilitator and Federal Project Executive. Our website is very content-rich with ESPC-related materials to address whatever learning curve an agency needs to conquer.

5) What are the most common challenges for agencies pursuing an ESPC for the first time?

General construction: ESPCs are generally large construction projects and, as in other construction projects, you never really know what is behind the walls. There can be surprises at any stage of construction. Beyond that, the agency must have the expertise and manpower to manage a large construction project occurring on their installation: approving schedules, providing building access, reviewing construction drawings and commissioning reports, and inspecting equipment installation prior to final acceptance.

Legal: Agency legal teams must review and approve contracts in a timely manner and procurement professionals perform the actual acquisition, and either of these can cause delays in awarding contracts if personnel are not familiar with the ESPC process.

Technical: Technical oversight is often needed to make sure the project is right for the agency/building and that it is a good investment for the taxpayers.

FEMP provides many services to assist agencies in project development. Our Federal Project Executives (FPEs) advise agencies on at every stage of the process. FEMP also provides Project Facilitators. These are engineers with years of experience in ESPC who assist the agency in the day to day technical aspects of the project, such as reviewing project costs and savings estimates, reviewing commissioning plans and plans for measurement and verification of savings, and advising on issues that arise during construction.

6) What distinguishes ESPCs from traditional construction contracts?

Traditional contracts most often involve installation of specific pieces of equipment. In an ESPC, the agency is usually requesting that an ESCO develop a comprehensive energy and water conservation project. The Notice of Opportunity may include a request to consider certain types of equipment and some specific buildings and systems, but in general the ESCO will assess all energy- and water-consuming systems at the site to develop the project. The final composition of this project will depend on the agency's needs and the availability of an economically feasible package of conservation measures at the site.

Another difference is in the performance period. With most traditional federal construction projects, the involvement of the contractor ends when the equipment is commissioned and accepted. In ESPC, equipment acceptance marks the beginning of the performance period, which can last as long as 25 years (minus the construction period). The average is 17 years. During this period, the ESCO is responsible for ensuring that the equipment continues to perform to specifications and is delivering the guaranteed savings. At least once per year, the ESCO will perform measurement and verification (M&V) of these savings, and prepares a report to the agency detailing its findings. The agency is responsible for witnessing the M&V activities, and for reviewing and approving the report.

Through its Life of Contract program, FEMP maintains contact with personnel at an ESPC site throughout the entire performance period, ensuring that annual reports are received, and that equipment is still operational and providing savings and is being properly maintained. The Life of Contract program also provides periodic training in performance period management and ensures that the sites have access to the most current FEMP guidance.

7) Does FEMP advise agencies to start with small ESPCs and gain some experience before tackling bigger projects?

FEMP has seen some agencies take this approach, and there are certainly some advantages to it. Agencies may be limited in their ability to monitor a large construction project, so it is sometimes advantageous to break a project into phases. However, there is also a degree of overhead in each project, in terms of time and cost. So breaking a project into phases may not be the best approach in every case. The average ESPC acquisition size is \$15M with a 17 year term.

In addition, FEMP has developed ESPC ENABLE to address smaller buildings that are typically underserved by ESPC. ENABLE provides a standardized and streamlined process for small federal facilities to install targeted energy/water conservation measures (ECMs) in six months or less. ENABLE currently supports five ECM categories: lighting, water fixtures, basic HVAC controls and basic HVAC equipment replacement, and solar PV.

8) What do agencies need to know as they initially plan ESPC project scope, energy-savings objectives, and financing terms?

Any project should be consistent with the site's long-term master plan. Obviously a building slated for demolition during the likely term of an ESPC should not be included in a project. A building scheduled for a major change in operation – such as converting a barracks building into office space – could necessitate a change in the way savings are calculated (baseline adjustment) at some point down the road. So it's important to anticipate these changes and plan for them in the contract.

As for energy savings objectives, we encourage agencies to be open to a wide variety of measures. They may have a desire to investigate certain technologies, and it's important to include those in the notice of opportunity, but an ESCO should be encouraged to develop a comprehensive project. That's where their expertise lies – in their ability to perform assessments, find opportunities to save energy and water, and develop comprehensive projects.

Financing rates are generally not under the control of the ESCO; they are subject to the same market forces that drive interest rates on other types of loans. These finance rates do affect the length of the performance period of an ESPC, however. In general, the agency will maximize project investment and the savings delivered when the length of the performance period is maximized, subject to the statutory limit of 25 years (which includes the construction period).

9) What are the agency customer and ESCO roles in structuring the ESPC project, such as scale and scope of work, setting the baselines, etc.?

An ESPC is a partnership between an agency and an ESCO. This allows for maximum flexibility during the process. The ESCO responds to the needs of the agency, and puts together a project that meets those needs.

GSA's National Deep Energy Retrofit Pilot Program is a great example of an agency working with ESCOs on an integrated design approach in ESPC projects. The Deep Retrofit Program laid out goals, challenges, and risk level tolerance. This approach led to a 38% savings, double the average seen in other recent projects.

10) Can agencies obtain information about the specific terms of other ESPC projects to use as benchmarks in negotiations?

FEMP maintains records on all projects awarded under our IDIQ contract, including the prices paid for specific ECMs and ancillary services, interest rates, and other project characteristics. We make this information available to agencies that are negotiating new task orders.

FEMP's eProject Builder (ePB), a recently developed performance contract database, will allow even more information to be captured. ePB captures standard information on each project, including ECM pricing, savings projections, details on project financing, and other key details. As projects are entered into the system, more benchmarking will be available for performance contracts across the government. States, municipalities, local government, and private and non-profit organizations can also enter their performance contracts into ePB.

11) Is there much competition among contractors for ESPC projects?

There is a great deal of competition. Our ESPC contract was awarded to 16 different energy services companies (ESCOs). All 16 are afforded a chance to compete for each task order. In addition, ESCOs use competition to select their construction subcontractors.

The following Table lists the ESCOs who have been awarded DOE or Corps of Engineers contracts. The ten ESCOs highlighted in green are common to both programs.

ESCO	DOE IDIQ	USACE MATOC
AECOM		
Ameresco	X	X
Burns & McDonnell		X
Chevron		X
Clark	X	
ConEd Solutions	X	X
Constellation	X	X
Energy Systems Group	X	
FPL	X	X
Honeywell	X	X
JCI	X	X
Leidos	X	X
Lockheed Martin	X	
McKinstry	X	
Noresco	X	X
Pepco	X	X
Schneider Electric	X	

SEI Group		X
Siemens	X	X
Trane	X	

12) Overall how many federal ESPC projects have been done, and what have they saved?

Since the inception of the DOE ESPCs in 1998, more than 340 task orders have been awarded. More than \$4 billion has been invested in federal energy efficiency and renewable energy improvements. These improvements are generating more than 435 trillion Btu in life-cycle energy savings and more than \$9.7 billion of cumulative energy cost savings for the federal government. This is equivalent to removing more than 5.6 million cars from the road in one year or eliminating the average annual energy use of more than 4.8 million households.

Those savings, to be clear, are the full contract savings, so some of those savings have occurred already and some have yet to occur during the contract fulfillment period.

Over the course of the performance period, most of those savings will be paid to the ESCO for debt service and for performance-period services they provide. But studies suggest that agencies are receiving additional cost savings in these projects, equal in magnitude to the guaranteed savings themselves. For example, when the performance period is completed, all savings accrues to the agency. At the end of a typical 17 year performance period, the equipment usually has many years of useful life remaining.

13) What are the energy and cost savings for an average ESPC project?

On average, comprehensive ESPC projects result in about a 19-20% reduction in energy use – and energy and energy-related costs. The average length of the post-acceptance performance period is 17 years, and the average project investment is about \$15 million.

FEMP is working with agencies to increase those savings. As mentioned above, an exciting development is the General Services Administration’s National Deep Energy Retrofit program, which doubled the level of savings achieved in a group of ten task orders awarded under our ESPC contract.

14) What are some examples of how renewable energy and on-site energy generation can be integrated into ESPCs?

There is presently a mandate for federal facilities that 20 percent of their energy use must come from renewable sources by 2020. Performance-based contracts can be used to help meet that goal. Historically, about 10% of the project investment under our ESPC program has been for renewables, so it’s a respectable portion of the total.

Many agencies are also concerned about energy security. You can use a performance-based contract to enhance energy security if on-site generation is installed as part of the project — for example, a combined heat power plant could help improve energy security by generating both electricity and heating on site.

A good recent example of a project that integrates renewables is the Almeric Christian Federal Building in St. Croix, US Virgin Islands. Implemented under GSA's National Deep Energy Retrofit Program, the \$6.3 million effort is the first net-zero project to be installed under our ESPC program. It's a great example of integrated design. The project included replacement of air handling units, the building automation system, and the primary electrical transformer. Reducing the space conditioning loads and the overall electrical demand of the building made it possible to include enough ground-mounted solar to provide all electricity from this renewable source (on a net annual basis).

15) What should agencies know about implementing renewables?

Renewables tend to have longer paybacks than more conventional ECMs, so in order to fit them into ESPC projects, agencies must include them as part of a more comprehensive project, as was done on the Almeric Christian project.

Renewables sometimes require specialized expertise, and agencies may not have the expertise needed to review and evaluate proposals. FEMP provides access to expertise at the national laboratories such as the National Renewable Energy Laboratory to assist agencies.

Scoring is another concern in renewables projects. ESPCs are generally scored on an annual basis, meaning that the Agency is only required to have funding in its budget to pay the annual payment to the ESCO. For an ESPC or UESC that includes on-site energy generation to be scored on an annual basis OMB's guidance states that the federal government must retain title to the installed capital goods at the conclusion of the contract.

16) Which are the most challenging goals? Can ESPCs help?

The most challenging goal is often the renewables goal, because of the longer payback of these measures. As mentioned, ESPC can help because renewables technologies can be bundled together with more conventional ECMs as part of a comprehensive retrofit project.

The greatest challenge from a management perspective is the "goal behind the goal" – getting people to act. Individual decision-making is a major barrier to energy efficiency, and so agencies must focus on individuals within the organization who are influencing decisions related to implementing ESPC projects, and changing their behaviors. Culture change is an important part of making ESPCs work to help agencies meet mandated goals.

17) How do the administrative and oversight responsibilities differ for an ESPC as compared to a traditional IDIQ services contract or traditional construction contract?

During the construction period, an agency's role is pretty much the same as in a traditional construction contract. As I said, the main difference comes in the performance period, when the agency must witness M&V activities and review annual reports. The agency is also responsible for ensuring the integrity of the contract. For example, if the decision is made to curtail operations in a building that contains ESCO-installed ECMs, the agency will need to modify the contract to buy out that particular ECM.

FEMP checks in with agencies twice per year to make sure this process is going well and the agency personnel understand their responsibilities.

18) What role does FEMP play in federal ESPCs?

FEMP provides a complete array of services to agencies during the ESPC development process. Each project is managed by a FEMP Federal Project Executive (FPE) who has the overall responsibility of assisting the agency through project award. The FPE is assisted by a trained Project Facilitator (PF) who participates in technical meetings and assists the agency in reviewing key documents such as the Preliminary Assessment, the Investment-Grade Audit report, and Measurement and Verification Plan. The PF provides assistance during the construction period as well, assisting the agency in review of the Commissioning Plan and other key documents. The PF provides assistance through the first year of the performance period and reviews the first year's M&V report.

FEMP can also make other technical experts available for specialized technologies such as solar PV, geothermal, and wind.

19) Do ESPCs (financed) cost more than directly funded energy projects?

Certainly ESPCs include interest costs, which are not incurred in appropriations-funded projects. FEMP maintains that if an agency has enough appropriations to do all of the energy projects it needs to do to meet the federal goals, then they should use the appropriations. But the fact is, the appropriations are just not there to do all that is needed. And we have studies to show that when you take into account the cost of waiting for appropriations to show up – that is, the cost of the extra energy and maintenance costs the agency incurs by keeping old, inefficient equipment in place – ESPC usually has a lower life-cycle cost to the government.

If an agency does have some appropriations available it's important to apply them correctly so as to leverage a larger overall project with an ESPC. Appropriated funds should be applied to the ESPC as a one-time payment from savings, if possible; or otherwise used to directly fund implementation of long-payback ECMs such as renewables that may not fit into the ESPC project.

20) What are FEMP's plans to award follow-on ESPC contracts?

The program has offered a request for proposals to re-compete the DOE IDIQ award that was issued in 2008. We expect to award the new IDIQs in 2016.

21) Will the transition from the current DOE ESPC IDIQs to newly awarded IDIQs entail changes that will affect agency ESPC customers?

It is expected that the new contract will be very similar to the current contract. Over the past 19 years, we have developed quite a good process for developing, awarding, and administering ESPC projects. Agencies understand this process and are comfortable with it, and we don't expect to see major changes in the way it operates.

FEMP has made some improvements, though. Over the past year, to better serve federal customers, FEMP has standardized and streamlined the services provided by the FPE, PF, and other technical specialists during project development. This process is already in place, and is helping agencies meet the goals of the President's Performance Contracting Challenge.

In addition, FEMP has developed a tool called eProject Builder (ePB) that is a free, secure, web-based system developed and managed by Lawrence Berkeley National Laboratory on behalf of FEMP. ePB enables ESCOs and their customers to upload, track, and report their ESPC project-level data through the time of contract award. The use of ePB will be integrated into our new contract, and will enhance agencies' ability to track their projects from the development phase through award, implementation, and performance.

22) Do agencies commonly ask questions about selecting an ESCO for a project?

Agencies often ask about how to select an ESCO for a project. All 16 ESCOs are highly qualified, so how does an agency select the right one? There is a very well-defined process for ESCO selection, but it begins with acquisition planning and the issuance of a Notice of Opportunity (NOO). The NOO should clearly specify the agency's priorities and objectives for the project. The agency evaluates ESCO responses in light of these requirements, and selects two or more ESCOs to provide additional information, for example on previous projects similar in nature to what the agency is trying to achieve.

23) Are ESPCs useful for improving energy performance of data centers?

DOE does have a very robust data center program. At the end of FY 2014 we kicked off the Data Center Better Buildings Challenge.

The Better Buildings Challenge is a national challenge run by our building technologies program, asking buildings and organizations across the country to commit to a 20-percent energy reduction. The Better Buildings Data Center Challenge is an offshoot of that, where we're asking data centers to commit to that challenge to reduce their energy consumption in those data centers.

FEMP's focus is not the electronic components — the servers and the hard disk drives — because that's not our area of expertise. Our area of expertise really focuses on the ventilation and air conditioning systems and related controls in these buildings. What we have found in data centers is that often as much energy is used by the building support system as in the data center itself. So, we issued a challenge asking for a 20 percent reduction in a portfolio of data centers as part of the Better Buildings Challenge. Performance-based contracting has always been used to support those building systems, and can continue to be used to support those building systems.

24) Can agencies do multiple separate ESPCs projects on one facility?

Agencies certainly can. Of course, subsequent ESPCs will have to address buildings and/or systems that were not addressed in the original ESPC. For example, a large military base may phase its ESPCs by area, addressing buildings in one area in the first phase, and another area in the second.

25) How are agencies doing in meeting the goals of the Presidential Performance Contracting Challenge? What are successful agencies doing?

In 2011, the president issued the original directive to complete \$2 billion in performance-based contracts, which included ESPCs and UESCs. In 2013, the president extended and increased the goal to \$4 billion. Agencies are now working toward the \$4 billion goal by 2016, and federal progress is being tracked toward the extended goal.

PPCC Progress is reported on the 15th of each month. As of April 15, 2015, agencies had awarded 201 projects valued at \$4.81 billion. See link at <http://energy.gov/eere/femp/downloads/performance-toward-new-4-billion-goal> for monthly updates.

To see how it's done, it's best to look at the agencies that have been most successful at meeting the President's goal. Meeting a goal like this requires a plan – sort of an energy master plan for the entire agency. Some agencies already had that plan in place. They knew which of their facilities were due for energy upgrades, they had these projects prioritized, and they had rough estimates of the investment that would be required. This allowed these agencies to provide realistic commitments to the total goal, and to begin developing and awarding projects. These agencies moved forward quickly.

Another key to success is centralized management of the process. Is there someone, or some office in the agency, that is responsible for meeting the goal? Do they have the authority and influence to get projects started, and to remove roadblocks when projects get stalled for any reason? There is a need for a management structure like this.

Projects awarded so far as a result of the President's challenge will reduce the government's energy use by 6.4 billion Btu per year, and eliminate more than 685,000 tons of annual CO₂ production, while creating over 15,000 private sector jobs in the construction industry and across the manufacturing supply chain. Full achievement of the President's goal will essentially double these figures.

As important as these results are, reporting to the White House on progress toward the President's goal has had the additional benefit of creating a unique and effective government-wide process for promoting and tracking the implementation of energy and water conservation measures. The net result has been to stand up organizations or processes within many federal agencies to identify and select projects, set goals and timelines, ensure steady progress toward award, and report data on that progress to a central database. This will be the lasting achievement of the President's Performance Contracting Challenge.