

# The Inefficient Financing of Federal Agency Energy Projects

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## I. Introduction

In a previous paper,<sup>1</sup> I argued that federal agency investment in energy projects appears to be inefficient because these agencies tend to finance the investment through higher cost private sources rather than through the government itself. In that paper, I suggested that the magnitude of such investment and the likely interest differential implied an inefficiency of as much as \$60 million per year.

In this paper, I will update the earlier estimate, showing that the number is probably much larger than I originally thought. I will go on to explain why the inefficiency persists, why individual agencies have little incentive to alter the institutions that sustain it, and why Congress leaves it untouched. If a change is to be made, the likely impetus would come from a source with an overarching fiscal management perspective such as the Office of Management and Budget (OMB) or the US Treasury. The paper concludes with an observation concerning an old economist quip.

## II. Background

### *1. Agency Access to Private Financing for Energy Projects*

To provide context, I will briefly review means whereby federal agencies can utilize private financing to invest in energy efficiency and renewable energy projects. These include:

- Energy Service Performance Contracts (ESPCs)
- Utility Energy Service Contracts (UESCs)
- Power Purchase Agreements (PPAs)
- Enhanced Use Leases (EULs)

In general terms, an ESPC is a partnership between a federal agency and an energy service company to improve energy efficiency in the agency's facilities, a UESC is a partnership between an agency and a utility for energy efficiency improvements and demand-reduction services, a PPA is a contract between a federal agency and an energy supplier to build renewable facilities to produce power, and an EUL is a real estate transaction whereby an agency leases underutilized land for monetary payment or in-kind consideration, such as renewable energy generation and supply. I will ignore EULs in what follows as these rarely occur and are of a different nature than the others.

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<sup>1</sup> Michael E. Canes, "The Peculiar Economics of Federal Energy Management," *Energy Policy*, Volume 91, April 2016.

There are two programmatic forms of ESPCs; 1) the regular program which is administered by the US Department of Energy (DOE), and 2) ESPC ENABLE, a program for smaller projects that is administered by the General Services Administration. DOE has played an important role in developing the ESPC program and helping agencies use it. Within DOE, the Federal Energy Management Program (FEMP), an arm of the Office of Energy Efficiency and Renewable Energy, has prepared guidance documents and training on how to approach and execute ESPCs. Generally, agencies engaging in ESPCs have looked to FEMP for assistance in formulating and executing their programs.

## 2. Cost Effectiveness

Several studies have examined ESPC programs and found that they are cost effective. For example, a 2005 Lawrence Berkeley National Laboratory (LBNL) study concluded that federal projects had a benefit to cost ratio of about 1.6 to 1. It also noted that the net present value of some 1,000 ESPC projects at the time (including those at the state and local level) was more than \$1.7 billion in 2003 dollars using a 7 percent discount rate.<sup>2</sup> Another study by three analysts at LBNL reported that through FY13, 20 different federal agencies and departments had committed to over 600 ESPC projects, securing \$6 billion in private funding and promising \$15 billion in energy and operational cost savings.<sup>3</sup>

Oak Ridge National Laboratory (ORNL) has annually reviewed the extent to which federal agency ESPCs met their expected cost and energy savings. The 2015 report, for example, stated that the value of savings shown in annual measurement and verification reports for 156 federal ESPC projects was 105 percent of guaranteed cost savings while reported energy savings were about 102 percent of estimated savings.<sup>4</sup> The LBNL and ORNL reports suggest that ESPC programs have been cost effective.

On the other hand, the U.S. Government Accountability Office (GAO) has expressed reservation with respect to ESPC outcomes. In 2005, for example, it concluded that, though federal officials generally reported that energy and operational savings covered costs, the data were insufficient to demonstrate such savings and more expertise in overseeing such contracts and greater documentation were necessary.<sup>5</sup> In 2015, GAO examined a sample of 20 ESPCs at seven federal agencies and concluded that while claimed cost and energy savings exceeded expected results, these savings often were overstated.<sup>6</sup> It also concluded that ESPC oversight and evaluation at these agencies needed improvement.

Neither UESCs nor PPAs seem to have been evaluated in the open literature. A good deal of material exists explaining such mechanisms and how to use them, but to date no one has looked

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<sup>2</sup> Nicole Hopper, Charles Goldman and Jennifer McWilliams, *Public and Institutional Markets for ESCO Services: Comparing Programs, Practices, and Performances*, LBNL, March 2005.

<sup>3</sup> Phillip Coleman, Shankar Earni, and Charles Williams, LBNL, *Could What That ESCO Rep Said Really be True? Savings Realization Rates in ESPC versus Bid-to-Spec Projects*, LBNL, August 2014.

<sup>4</sup> ORNL, *Reported Energy and Cost Savings from the DOE ESPC Program: FY 2014*, ORNL—TM 2015/110, March 2015.

<sup>5</sup> GAO, *Energy Savings: Performance Contracts Offer Benefits but Vigilance is Needed to Protect Government Interests*, GAO-05-340, June 22, 2005.

<sup>6</sup> GAO, *Energy Savings Performance Contracts: Additional Actions Needed to Improve Federal Oversight*, GAO-15-432, June 17, 2015.

at past such agreements and publicly reported how they have worked out. Nevertheless, agencies continue to utilize and even expand them, suggesting that at least some likely pass a cost benefit test.<sup>7</sup>

### **III. Magnitude of the Financing Inefficiency**

In a recent webinar presentation,<sup>8</sup> FEMP representatives indicated that aggregate spending on ESPCs and UESCs between FY1999 and FY2016 totaled about \$9 billion, with such spending in FY2016 at a record high of \$1.1 billion. While some projects may be reaching their end (a 10-year project initiated in FY2007 for example), others are being initiated and the pace of such projects is increasing (the last three fiscal years have seen the highest project levels on record). Further, these contracts can last for up to 25 years. Thus, assuming all of these commitments were financed by private monies and that federal financing costs generally were lower than private, the scope for savings on these two types of contracts appears large.

A good deal of money also is being invested via PPAs though there is no published total. Each of the armed services has been tasked by the Department of Defense (DoD) to produce one gigawatt of energy via renewable sources by 2025, and in 2012 the Army announced a multi-year program to invest \$7 billion in energy efficiency and renewable energy. The Navy aims to achieve its target by 2020 and recently signed a large PPA with Sempra Energy that reportedly will provide 450 MW of solar-based power capacity. The Air Force and Marine Corps also utilize PPAs, but have not made investment figures publicly available. If the Army program is indicative, however, then even a conservative estimate of what DoD cumulatively will invest in renewables over the next several years would be \$10 to \$15 billion. DoD PPAs can last for up to 30 years, so the billions in borrowed monies are likely to last for decades.<sup>9</sup>

Between the ESPC, UESC and PPA programs supporting federal energy projects, the cumulative borrowing is likely to reach at least \$15-20 billion in total over time. Interest savings would occur annually, so yearly savings would be this total times the interest differential between private and Treasury borrowing.

How much is this difference? The matter is complicated with respect to ESPC contractors because DOE's 'approved' list contains both small and large firms. Further, data shows that the difference varies through time, relatively close when the economy is doing well and further apart when the economy goes into recession and business risk rises. Figure 1 shows the differential in yields between AAA corporate bond and 10-year Treasury bond yields between 2001 and 2016. These data come from the St. Louis Federal Reserve's FRED database. As can be seen, the differential can be as low as .7 percent but as high as 2.7 percent, depending on economic conditions. In recent years the differential has ranged between one and two percent per annum.

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<sup>7</sup> In my earlier paper, I pointed out that federal energy goals sometimes push agencies to make investments that are not necessarily cost effective from a strictly economic point of view. Nevertheless, agencies are supposed to demonstrate savings over time that will pay for the investments, however uncertain the projections may be.

<sup>8</sup> "Energy Performance Contracting: Tools For Success," FEMP First Thursday Updates, March 2, 2017.

<sup>9</sup> However, if a PPA involves an emerging technology, it may be eligible for a government guaranteed loan, effectively a form of public financing. Some PPAs have been financed in this way.

Differentials between lower rated corporate bonds and 10-year Treasuries would be greater. Nevertheless, from the data at hand I project a 1.5 percent rate differential.

*Figure 1. AAA Bond Yield Relative to Treasury 10-year Bond Yield*  
(Source: St. Louis Federal Reserve Bank)



If private financing of federal energy projects reaches \$10 billion over the next several years and there is a 1.5 percent interest rate differential between private and federal borrowing, then the financing inefficiency is around \$150 million per year. If total borrowing reaches even higher numbers, so too would the inefficiency. A plausible estimate is that the inefficiency likely will reach around \$200 million per year though the number is inexact because the extent of government borrowing from private sources for PPA projects is not available publicly.

#### **IV. Legal and Policy Objections to Federal Financing of Agency Energy Investments**

##### *1. Legal Issue*

The principal legislative reference to ESPCs occurs in the Energy Independence and Security Act (EISA) of 2007 (PL 110-140). Section 512 (Financing Flexibility) of that Act says:

Section 801(a) (2) of the National Energy Conservation Policy Act is amended by adding at the end the following:

- E. FUNDING OPTIONS - In carrying out a contract under this title, a Federal agency may use any combination of --
- (i) appropriated funds; and
  - (ii) private financing under an Energy Savings Performance Contract

One interpretation of this provision is that agencies are empowered to use appropriated funds or private financing for energy projects but are not expressly forbidden from borrowing via a federal entity as well. A second and different interpretation is that the two funding options are all that Congress has made available, and none other may be used.

According to a source at FEMP,<sup>10</sup> that Program's legal counsel believes strongly that only appropriated funds or private financing can be used. Because of this, FEMP will not engage in projects in which a federal entity seeks funds from some other source because it would consider such projects illegal.

This is important because FEMP provides support services to agencies writing contracts with private sources to engage in energy conservation or green energy production. Generally speaking, they are the "go-to" agency within the federal government for assistance in formulating and implementing such projects.

There is a possible political motivation for why Congress limited energy financing solely to appropriations or private finance. If a governmental entity finances an energy project that ultimately fails, the taxpayer is left holding the bag, having invested some amount of capital and receiving little or no return. With private financing this does not occur; if a project fails a private entity takes the loss. The failure of Solyndra illustrates the point; in that case taxpayers funded a large solar project under a DOE loan guarantee program because it was considered advanced technology, but when the project failed, taxpayers were forced to absorb several hundred million dollars in losses and there was considerable adverse publicity.<sup>11</sup>

Another type of political motivation is that those who currently profit from financing federal energy projects likely would push back if an agency announced it would henceforth finance such projects through a federal borrowing entity. In other words, given a history of private financing and the institutions that have developed to accommodate it, Congress itself would have to change or at least clarify EISA Section 512 to clear the way for public financing.

## *2. Agency Perspective*

The savings available to the federal government taken as a whole look different from an individual agency perspective. For one thing, agencies often are able to take advantage of tax incentives offered to private vendors for these kinds of projects. Such incentives are offered by the federal government and some states and localities, but incentives such as investment tax credits or accelerated depreciation cannot be claimed by the federal government itself since it does not pay income taxes. If a project were federally financed and the assets federally owned, the incentives would not apply.

From an overall federal perspective, such incentives merely take money from one place (the US Treasury) and put it in another. However, from an agency's perspective some of the potential savings from borrowing at a lower interest rate would be offset by the tax breaks a private energy contractor passes on. This implies that individual agencies will be less interested in federal

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<sup>10</sup>Mr. Thomas Hattery, Federal Financing Specialist, interview of February 28, 2017.

<sup>11</sup> See for example Ronald D. White, "Solar panel firm Solyndra to cease operations," Los Angeles Times, September 1, 2011.

financing than would an overall federal entity such as OMB or the Treasury, which would see the net savings from a different perspective.

### *3. Timing and Budget Uncertainty Objections*

A September 2016 GAO report on DoD renewable energy projects brings to light additional considerations that favor financing renewable energy projects through private developers.<sup>12</sup>

DoD officials indicated to GAO that the time involved in obtaining up-front appropriated funding often is notably longer than accessing capital through alternative financing mechanisms. This occurs because the DoD programming and budgeting process is complicated and therefore time consuming to navigate. While DoD may have more complicated budgeting procedures than many other agencies, the same point likely would be made by them. Appropriations occur only once per year while private capital might be accessed at any time that an energy-related project is ready to be implemented.

A related point is that the federal budgeting process is uncertain in the sense that an agency cannot be sure what its appropriated budget will be until Congress has enacted it. Thus, an agency may not know how much it can invest in energy projects until a budget is put in place, sometimes well into the current fiscal year. In contrast, private financing is available any time an agency is ready to engage in an energy project, for any amount that can be economically justified.

### *4. Where Does Congress Stand?*

There is no indication that Congress has had second thoughts about enabling agencies to tap into private capital to finance energy projects, and indeed it seems willing to expand such access. For example, the US Department of Housing and Urban Development can tap private funds through a recently enacted Rental Assistance Demonstration program.<sup>13</sup> These funds are intended to upgrade the nation's public housing stock and can be used for energy-related projects among others. By inference, Congress does not view private financing of ESPCs, UESCs and PPAs as a mistake.

## **V. Conclusions**

Are there institutional arrangements that could achieve the savings I have outlined? Very likely the answer is yes. Years ago the federal government financed a bailout of the savings and loan industry through the Resolution Funding Corporation, a special purpose entity created by Congress to finance the Resolution Trust Corporation. This experience could serve as a model for a special purpose entity to raise monies for federal energy projects.

Alternatively, the Federal Finance Bank, which already exists, could be used for the purpose. Agencies would submit their annual energy project budgets to FFB, the bank would raise the

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<sup>12</sup> GAO, *DOD Renewable Energy Projects: Improved Guidance Needed for Analyzing and Documenting Costs and Benefits*, GAO-16-487, September 2016. GAO, *DOD Renewable Energy Projects: Improved Guidance Needed for Analyzing and Documenting Costs and Benefits*, GAO-16-487, September 2016.

<sup>13</sup> "Consolidated and Further Continuing Appropriations Act of 2012, (Public Law 112-55).

monies via the Treasury, and the agencies would pay the loans back through their energy-related savings. Some organization and paperwork would be required, but given the magnitude of the potential savings there should be a net social gain.

There is an old economist quip that there cannot be a \$20 bill lying on the sidewalk because if there were someone would have picked it up. Does private financing of federal energy projects amount to a \$20 bill lying on the sidewalk? Evidently it does; there seems to be an opportunity to save some \$150 million per year via a shift in the financing of these projects. But is the bill likely to be picked up? It doesn't seem so. What makes sense politically is not necessarily the same as what makes sense economically.