The Path to Savings: Understanding the Federal Purchase of Energy-Consuming Products

Prepared for the Federal Energy Management Program by

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Executive Summary

Energy efficiency has been a federal procurement policy objective since at least 1992, with the origin of the Energy Efficient Product Procurement (EEPP) program within the larger Federal Energy Management Program (FEMP). Today, the EEPP program's mandate is based on requirements that 95% of new contract actions, task orders, and delivery orders for products and services be energy and water efficient, as laid out in Executive Order 13514 in 2009.

Facilitating full compliance with EO 13514 presents a significant strategic planning challenge to the FEMP EEPP program, given the size of the federal government, the range of missions of its many agencies, the mix of management approaches for its buildings, and the diverse set of roughly 80 energy efficient products which has been established through preceding legislation and executive orders. The goal of this report is to aid the program in prioritizing its resources by providing an overview of how the purchase of energy-consuming products occurs in today's evolving federal procurement system, as well as identify likely intervention points and compliance review mechanisms.

Through a synthesis of the literature on U.S. federal sector procurement and two dozen primary interviews, the report particularly focuses on the importance of price in determining the actor(s) responsible for any given purchase of an energy-consuming product. This identification is important, as the relevant actors are trained and reviewed in different ways that the FEMP EEPP program can prioritize for targeting, based on the decision criteria such as the potential energy savings associated with the actor's purchases or the administrative ease of the intervention.

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I. Introduction

The government sector accounts for a significant fraction of global demand for goods and services, with the U.S. federal government alone considered the world's largest purchaser (Gordon 2011).[1] Green public procurement programs attempt to leverage this demand to drive the sustainability of government operations and to induce innovation in the private sector.[2]

Green public procurement programs are related to a larger universe of product sustainability initiatives that include ecolabels, standards and codes, and marketing/consumer guides that aim to improve the performance of products for societal consumption according to such varied attributes as: recycled and biodegradable content; impact on stratospheric ozone, indoor air quality, global warming potential, habitat alteration, and eutrophication; and water and energy efficiency. With the proliferation of product sustainability initiatives over recent years – by 2011, at least 426 ecolabels alone existed across 25 industry sectors in 246 countries (O'Rourke 2011) – governments face a challenge in focusing green public procurement on the most cost-effective approaches.

Cost is a particularly important factor in green public procurement, as the government acquisition system is predicated on the responsible stewardship of government resources. For example, the priorities of the U.S. federal acquisition system are codified in 48 CFR 1.102: "(1) Satisfy the customer in terms of cost, quality, and timeliness of the delivered product or service…; (2) Minimize administrative operating costs; (3) Conduct business with integrity, fairness, and openness; and (4) Fulfill public policy objectives," such as sustainability.

In this context, it is noteworthy that energy efficiency has been a procurement policy objective since at least 1992, with the origin of the Energy Efficient Product Procurement (EEPP) program within the larger Federal Energy Management Program (FEMP). Today, the EEPP program's mandate is based on requirements that 95% of new contract actions, task orders[3], and delivery orders for products and services be energy and water efficient (Executive Order (EO) 13514 in 2009), with previous legislation establishing that energy-consuming products purchased by the federal sector must be either ENERGY STAR qualified, meet FEMP-designated efficiency requirements, have low-standby power of 1 watt or less, or be WaterSense labeled (see, e.g., the Energy Independence and Security Act (EISA) of 2007 and the Energy Policy Act (EPAct) of 2005). Roughly 80 products have been covered by the FEMP EEPP program since it began; these can be grouped into the categories of (1) commercial & industrial equipment; (2) lighting; (3) commercial food service equipment; (4) information technology; (5) commercial appliances;

[1] State and local procurement expenditures in the U.S. are roughly six times larger than federal expenditures, although they are administered through at least 83,000 local procurement entities (Thai 2001).

[2] Following Thai (2001), the term "procurement" is used in this report to include: "buying, purchasing, renting, leasing or otherwise acquiring any supplies, services or construction."

[3] In a task order contract, an agency chooses a contractor through full and open competition who is then permitted to undertake individual smaller jobs (task orders) without further competition (Kelman 2002).

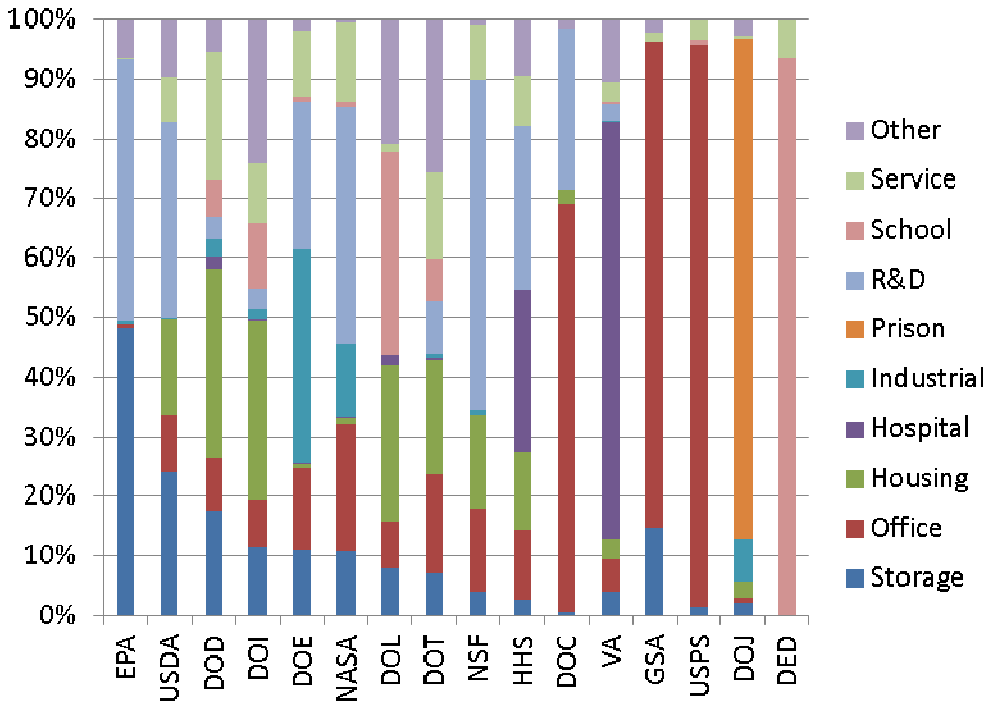
(6) residential appliances; (7) residential equipment; (8) plumbing; and (9) home electronics. In general, these products should have efficiency in the top 25% of the market for their product type; represent significant energy savings if purchased consistently across the federal government; be life-cycle cost-effective, with measurable and verifiable energy consumption and performance; and be offered for sale by more than one vendor.

Helping the federal government achieve full compliance with EO 13514 is an important goal for the FEMP EEPP program. The program already assists the federal government meet efficiency procurement targets through such activities as: providing online information resources regarding efficiency requirements, life cycle cost effectiveness calculations, and tips on selection and use of compliant products; incorporating performance levels for energy efficient products into guide/master specifications for federal agencies; helping federal supply sources (e.g., U.S. General Services Administration (GSA) and the Defense Logistics Agency (DLA)) identify relevant products in the online listings and catalogs they make available to federal buyers; and offering training programs to federal agencies on energy efficient product procurement.

But the size of the federal government, the range of missions of its many agencies, and the mix of management approaches for its buildings imply that full compliance with EO 13514 represents a significant challenge.

Figure 1 presents recent estimates of agency energy usage according to building type; it serves as a reminder that the demand for energy-consuming products in the federal government is not uniform. Note that the federal government consists of fifteen executive departments, roughly seventy independent agencies and corporations, and numerous associated commissions, boards, and enterprises, for a total of approximately 889,000 buildings (3.35 billion square feet) which are used for many functions, including office space, laboratories, hospitals, housing, and prisons, at an annual operating cost of roughly $30.8 billion (GSA 2011). The federal government owns 79% of its buildings, at an annual operating cost per square foot of $5.30; the rest are either leased from the private sector (17%, annual operating cost per square foot $15.00) or otherwise managed (4%), in which case they are typically owned by a state or foreign government, with usage rights assigned to the federal government through mechanisms other than leases.

Figure 1: Federal government energy use by building type for major departments and independent agencies



Sources: Author calculations based on compilation by Pacific Northwest National Labs of total building floor space by federal agency and federal floor space by major building type (from FEMP Annual Report to Congress, 2007 and Federal Facility Database, 2000).

The diversity of FEMP covered products and the scale and non-uniformity of the demand for these products across agencies presents a strategic planning challenge to the FEMP EEPP program. In order for the program to draw a roadmap for facilitating full EO 13514 compliance regarding energy and water efficiency, it must first understand how the purchase of energy-consuming products fits into the broader federal procurement system, then identify programmatic priorities for resource allocation based on likely intervention points. It must also be able to measure the federal government's progress in achieving EO 13514 goals in order to aid program evaluation and course correction.

This report lays the groundwork for these strategic planning efforts. The report harnesses the literature on U.S. federal sector procurement as well as two dozen primary interviews to provide an overview of the federal procurement system and the major trends that are shaping that system today.[4] The report further provides a more targeted understanding of how FEMP EEPP covered products are purchased within the federal procurement system at the transaction level, with a particular focus on potential intervention points and compliance review mechanisms.

[4] See Appendix A for details on the interview methodology followed in this report.

II. The Federal Procurement System

The federal procurement system operates at two major levels, the "policy level" and the "transaction level." The policy level incorporates major political, government-wide, and agency-specific procurement actors, which shape the ground rules for any government purchase. The transaction level incorporates the web of actors involved in specifying a purchase for which funds are available and obtaining the relevant goods or services by use of an appropriate procurement mechanism.

The Policy Level

Each of the three branches of the federal government plays a role in the procurement system. The legislative branch establishes laws which affect procurement policies and procedures, authorizes and appropriates funds for procurement, and exercises oversight over procurement through standing committees and the U.S. Government Accountability Office. The judiciary branch decides legal cases involving the federal government, with its judgments affecting the design of federal procurement regulations deemed to have the "force and effect of law." The executive branch establishes government-wide policies and procedures through executive orders and implements procurement statutes and budgetary appropriations. See Thai (2001) for more detail.

Three executive organizations play particularly important roles in federal procurement: the Office of Management and Budget (OMB), the General Services Administration (GSA) and the Defense Logistics Agency (DLA). The OMB recommends programmatic funding levels, monitors programs, and reviews proposed regulations for compliance with policy. It also develops and issues procurement guidance through its Office of Federal Procurement Policy (OFPP, which was established under the 1974 Federal Procurement Policy Act – see Gitterman (2012)). The OFPP leads the development and maintenance of the Federal Acquisition Regulation (FAR), which provides a unifying regulatory backbone for the federal procurement system, as codified in roughly 2,000 pages under Parts 1-53 of Title 48 of the Code of Federal Regulations.[5] Most federal agencies follow the FAR and supplemental agency guidance that conforms to the FAR but is more tailored to the agency's unique requirements.[6] Note that the energy and water efficiency requirements of the FAR are centered in Part 23 with other provisions related to the environment, renewable energy technologies, occupational safety, and a drug-free workplace.

In contrast to OMB's more policy and evaluation-oriented role in procurement, the GSA and DLA provide logistical support for the procurement of goods and services by federal agencies. The GSA, which was established under the 1949 Federal Property and Administrative Services

[5] The single set of regulations that comprise today's FAR was established under the 1984 Competition in Contracting Act. Before 1984, military purchasing was governed by the Defense Acquisition Regulations (DAR); before 1978, these were known as the Armed Services Procurement Regulations. Civilian purchasing was governed by the Federal Procurement Regulations (Gitterman 2012).

[6] The following agencies do not follow the FAR: the Central Intelligence Agency, the United States Postal Service, the Tennessee Valley Authority, the Federal Aviation Administration, and the Bonneville Power Administration.

Act, supports the missions of both civilian and military agencies through functions such as supplying non-defense specific products and communications, providing transportation and building space, and developing management policies that support good government and socio-economic policies. The GSA manages the procurement, utilization, and disposal of government property through its major offices, which include the Federal Acquisition Service, the Public Buildings Service, the Office of Governmentwide Policy, and the Office of Small Business Utilization. The DLA, the origins of which date back to 1961, manages more defense-specific products and services through its mission as America's combat logistics support agency. Both agencies establish large government-wide acquisition contracts with vendors ("GWACs," e.g., GSA "schedules") so that federal buyers have access to products and services that meet the government's legal obligations, with the added benefit of volume discount pricing. Federal buyers have access to these products and services through several routes, including each agency's online shopping and ordering system, GSAAdvantage! and the Department of Defense (DOD) EMALL.

Although government procurement is constantly evolving, perhaps the most significant changes since the post-war establishment of the modern federal procurement system occurred in the 1990s, with the "reinventing government" initiative (Kelman 2002). The 1994 Federal Acquisition Streamlining Act (FASA) that emerged from this initiative was particularly important, as it enabled simplified acquisition procedures, facilitated the procurement of commercial technology, and changed the standard purchasing decision criteria from lowest bid to best value.

The simplified acquisition procedures (SAP) are of particular interest because of the diverse pathways they cover for purchases under the dollar amount of the "simplified acquisition threshold," which is currently $150,000 (for more detail see Straight (2004)).[7] For supplies and services, including construction, research and development, and commercial items that cost less than this amount but more than the "micro-purchase threshold" (see below), the typical purchasing pathway is for competitive quotations to be solicited, received and evaluated, with the government issuing a purchase order for the winning quotation. The purchase order becomes a binding contract only when the supplier accepts the government's order, either in writing or by commencing performance. The solicitation for quotation is published in the Federal Business Opportunities (FedBizOpps) online system only if it is for an amount of $25,000 or larger.

Another common SAP method is a blanket purchase agreement (BPA), which is designed to fill anticipated repetitive needs for a wide variety of items that are routinely purchased, even if the exact items, quantities, and delivery requirements are not known in advance. Once a BPA is established with a qualified source of supply, federal buyers can order items by placing calls on the BPA for less than the simplified acquisition threshold.

[7] Agencies are required to use SAP to the maximum extent practicable, with certain exceptions. SAP do not apply if an agency can meet its requirement using required sources of supply under FAR Part 8 (e.g., Federal Prison Industries, Committee for Purchase from People Who are Blind or Severely Disabled, etc.), existing indefinite delivery/indefinite quantity contracts, or other established contracts.

The SAP purchasing pathway that covers the largest single set of federal transactions, however, is the government-wide commercial purchase card ("p-card"), which is primarily used for "micro-purchases," which are purchases under a certain dollar value for which, traditionally, no competition rules applied.[8] For these micro-purchases, FASA eliminated seven statutory contract clauses, the small business requirement, and the requirement that the only individuals authorized to spend government money be warranted contracting officials. Today, the micro-purchase thresholds are: (1) $3,000 for supplies, (2) $2,500 for services, as subject to the McNamara-O'Hara Service Contract Act of 1965, and (3) $2,000 for construction, as subject to the Davis-Bacon Act of 1931.[9] Roughly 260,000 p-cards are currently in circulation, accounting for more than 80% of federal procurement transactions and almost $20 billion in expenditures (Gordon 2011a, Gordon 2011b). P-cards can be used with both private sector vendors and with the government supply systems of GSAAdvantage! and the DOD EMALL.

Streamlining also brought about innovation in purchasing vehicles for larger dollar amounts than the simplified acquisition threshold (note that such purchases are typically either sealed bid or negotiated contracts). GSA's elimination of the price reduction clause in 1996, which enabled vendors for the first time to offer some customers price reductions not offered to every customer, increased the popularity of the GSA schedules and led directly to the development of centralized GWACs for information technology supplies and services, including GWACs that one agency would offer to other agencies for a small fee (for more detail, see Kelman 2002). Streamlining similarly reduced the importance of military and commercial specifications in procurement, as it enabled government to contract with commercial suppliers offering electronic catalogues of commercial items for "just-in-time" delivery (this put ongoing pressure on the traditional stock-inventory approach GSA and DLA used to manage supplies).

The Transaction Level

The federal acquisition process begins with a requisitioning activity, proceeds along a purchasing pathway, and ends with the fulfillment of a government requirement. In considering the transaction level of the procurement system for energy-consuming products with an eye to potential intervention points and compliance review mechanisms for the FEMP EEPP program, we focus here only on the first two parts of this process, which are more prone to FEMP EEPP action as they are controlled by government employees rather than private sector actors.

Note that depending on the agency, procurement operations can occur at multiple organizational levels, including sub-agency operations and more centralized agency procurement offices (Thai 2001). Although most SAP occurs at the sub-agency level, the BPA pathway is more likely to

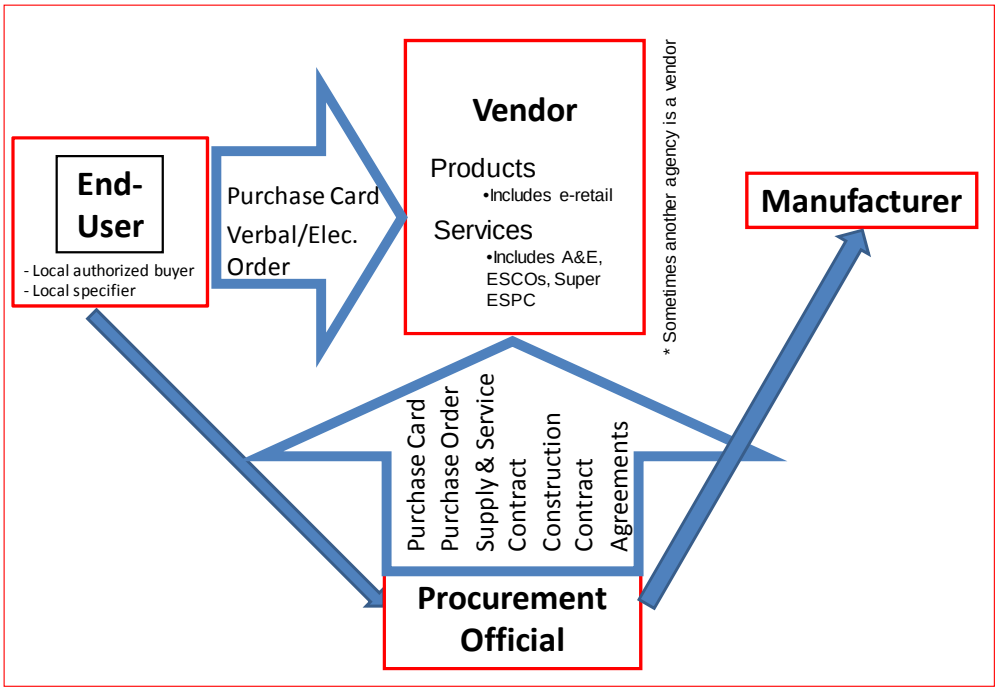
[8] Some agencies allow warranted contracting officers to hold p-cards up to the level of their warrant.

[9] The micro-purchase thresholds for the acquisitions of supplies or services that support a contingency operation or facilitate defense against or recovery from nuclear, biological, chemical or radiological attack are $15,000 in the case of any contract to be awarded and performed, or purchase to be made, inside the U.S., and $30,000 outside the U.S.

cross those organizational levels than the purchase order pathway. Similarly, contracts can be issued at multiple organizational levels.

Figure 2 provides a simplified diagram of the transaction level of the federal procurement system, which is designed to represent the purchasing pathways at play at a sub-agency organizational level. It is the result of a review of the literature on federal procurement, focus groups with FEMP EEPP officials, and the feedback of two dozen procurement officials representing numerous agencies and geographic areas.

Figure 2: The transaction level of the federal procurement system



In Figure 2, the end-user is the center both of the requisitioning activity and the originator of the direct purchasing pathways of p-cards and related orders against BPAs and GWACs. The needs of the end-user, who is the government employee who requires a product in order to perform his or her government duties, define the requisitioning activity. Either the end-user will provide individual input into product specifications (as in the case of the purchase of a desktop computer), or a government employee with a relevant function (e.g., a facilities manager) will serve as a local specifier of the requirements of the product on behalf of the end-user (as in the case of a broken boiler for an office building). For items under the micro-purchase threshold, a locally authorized buyer who is trained by the federal agency will typically control the purchasing pathway of the p-card; sometimes, this buyer is the end-user. Note that p-card purchases are usually audited regularly by the contracting personnel of the agency.

For items above the micro-purchase threshold, the requisitioning activity flows next to contracting personnel. These personnel help set the technical specifications for a product; set contract language; evaluate vendor product offerings and conduct market research; and provide

feedback to end users, vendors, and policy makers (Thai 2001; Drabkin and Thai 2003). Note that 54% of the acquisition workforce is eligible to retire within the next 10 years (FAI 2011).[10]

Contracting personnel have several purchasing pathways at their disposal, as depicted in Figure 2. Under the simplified acquisition threshold, they typically use purchase orders, but for larger purchases they can use purchase cards (up to the dollar value of their authorized expenditure for the federal government, or "warrant"), they can issue supply and service or construction contracts, and they can exercise agreements (exchanges in which no money trades hands). At times, contracting officers negotiate discounts directly with manufacturers, often in conjunction with establishing blanket purchase agreements.

Note that Figure 2 uses the term "vendors" to represent a diverse set of retailers/product distributors that offers products for sale through e-retailing and other interfaces, as well as submits bids to fill solicitations. Among the service vendors in Figure 2 are architect and engineering firms, contractors, energy service companies, and so-called "super" energy service performance contracts (indefinite-delivery, indefinite-quantity umbrella contracts awarded to various ESCOs).

III. Implications for FEMP EEPP covered products

The FEMP EEPP program covers roughly 80 products that range from commercial/industrial to residential, from big-ticket items that are rarely bought to relatively inexpensive items that are regularly purchased. Appendix B lists the 63 FEMP EEPP covered products for which energy savings could be calculated in *Program Potential: Estimates of Federal Energy Cost Savings from Energy Efficient Procurement*, which is the sister document to this report. Appendix B provides information on the category of each product, its average lifetime, and the bin its average price falls into, based on an assessment of GSAAdvantage! and other public sources such as Technical Support Documents, as well as an understanding of the relevance of price bins to potential intervention points and compliance review mechanisms for the FEMP EEPP program.

The price bins used in Appendix B are: (1) below the micro-purchase threshold (<$3,000, which applies to 48 FEMP EEPP covered products); (2) between the micro-purchase threshold and the dollar value necessitating publication on FedBizOpps ($3,000-$25,000, which applies to 11 products); and (3) larger than the FedBizOpps threshold (>$25,000, which applies to 4 products).

[10] The key occupational series for contracting officials are the Office of Personnel Management categories 1101 (general business and industry), 1102 (contracting specialists), 1105 (purchasing), and 1106 (procurement and clerical), for both civilian and military agencies (Federal Acquisition Institute 2011). In FY 2010, 74,630 individuals were employed in these series in the federal government (ibid.), with the Department of Defense (DOD) procurement workforce about 25% larger than that of civilian agencies. Although the largest grouping of procurement officials (19%) is based in the Washington, D.C. metropolitan area, the rest are relatively well-distributed geographically.

The 15 products in the price bins larger than the micro-purchase threshold are likely to be useful in training transaction level contracting personnel to achieve greater familiarity with EO 13514.[11]

But price bins do not tell the full story of the likely intervention points and compliance review mechanisms the FEMP EEPP program might pursue to facilitate full federal compliance with EO 13514. Appendix B divides FEMP EEPP covered products into two relevant sets. "Set 1" products include 28 products that are either above the micro-purchase threshold or are information technology products subject to centralized procurement through GWACs. These Set 1 products are good candidates for a review of whether a standard clause has been inserted in contracts and solicitations in FedBizOpps, in accordance with EO 13514, as the Alliance to Save Energy has already conducted on two occasions (Capanna, Devranoglu et. al. 2008; Siciliano 2010). Set 2 products, by contrast, include 32 products that are under the micro-purchase threshold, but might be good candidates for EO 13514 training for government purchase card holders, as well as candidates for compliance review in conjunction with audits of government credit cards.

Note that several Set 2 products could swing to Set 1 products if they are bought in batch purchases rather than individually. To illustrate the sensitivity of Set 2 products to quantity purchases, we considered what would happen if ten Set 2 products were bought at once. Under this scenario, 18 products would switch from Set 2 to Set 1. Unfortunately, developing a clear understanding of the most likely batches in which FEMP EEPP covered products are purchased was beyond the scope of this study.

Meanwhile the interviews conducted for this project suggest that three FEMP EEPP covered products are not typically purchased by the federal government: water coolers, beverage vending machines, and set-top/cable boxes. Water coolers are not typically purchased because the federal government is prohibited from using appropriated funds to purchase private water, except in instances in which poor water quality can be documented. Beverage vending machines are not typically purchased because they are generally leased from vendors, so the efficiency of these machines is generally outside government control. Similarly, the federal government usually leases set-top and cable boxes, as do most consumers of cable television.

Finally, interviews have also revealed a likely loophole in FEMP EEPP legal mandates regarding federal buildings that are not government owned, but are instead leased from the private sector or otherwise managed. For the 21% of federal buildings that are not federally owned, we estimate that 36 FEMP EEPP covered products are likely to be provided by the non-federal entity that owns the building, rather than procured by government contracting personnel. These 36 products are composed of 19 Set 1 products, 16 Set 2 products, and 1 product that is not typically bought

[11] Contracting personnel manage their ongoing training (e.g., continuous learning points, etc.) through the Federal Acquisition Institute Training Application System (FAITAS). Coursework at the Defense Acquisition University is readily accessible for procurement officials in military agencies, and is available on a more limited basis for procurement officials in civilian agencies. Depending on the agency, civilian agencies have agency-specific training available to them, in addition to centralized training under the Federal Acquisition Institute and its private contractors, such as Management Concepts International.

(beverage vending machines), as the non-federal entity is likely to manage the lease with the beverage vending company.

IV. References

Alliance to Save Energy (2012). Understanding Federal Compliance with Energy Efficiency Procurement Requirements: Procurement Forecast Review.

Capanna, S., S. Devranoglu, et al. (2008). A Review of Federal Agency Compliance with Energy-Efficient Procurement Laws. Washington, D.C., Alliance to Save Energy.

Drabkin, D. and K. Thai (2003). U.S. Federal Government Procurement: Structure, Process and Current Issues. International Purchasing and Supply Education and Research Association's Comparative Public Procurement Cases Workshop.

Federal Acquisition Institute (2011). FY2010 Annual Report on the Federal Acquisition Workforce.

Gitterman, D. P. (2012). "Presidency, the Power of the Purchaser, and Public Policy." The Forum 10(2).

Gordon, D. I. (2011). Memorandum for Chief Acquisition Officers and Chief Financial Officers: Increasing Opportunities for Small Businesses in Purchase Card Micro-Purchases. O. o. F. P. Policy.

Gordon, D. I. (2011). Statement of Daniel I. Gordon, Administrator for Federal Procurement Policy, Office of Management and Budget, before the Committee on Oversight and Government Reform, U.S. House of Representatives.

Kelman, S. (2002). "Remaking federal procurement." Public Contract Law Journal 31(Summer 2002): 581-622.

O'Rourke, A. (2011). Data Needs and Challenges in Sustainable Procurement. National Academy of Sciences Workshop "Fostering Sustainability Considerations into Public and Private Sector Procurement Tools and Capabilities". Washington, D.C., National Academy of Sciences.

Rosenthal, R. and R. Rosnow (2007). Essentials of Behavioral Research: Methods and Data Analysis. New York, McGraw-Hill.

Siciliano, G. (2010). 2010 Review of Federal Agency Compliance with Energy-Efficient Procurement Laws. Washington, D.C., Alliance to Save Energy.

Straight, R. L. (2004). Simplified Acquisition Procedures for Federal Purchases. 89th Annual International Supply Management Conference. Washington, D.C.

Thai, K. V. (2001). "Public Procurement Re-Examined." Journal of Public Procurement 1(1): 9-50.

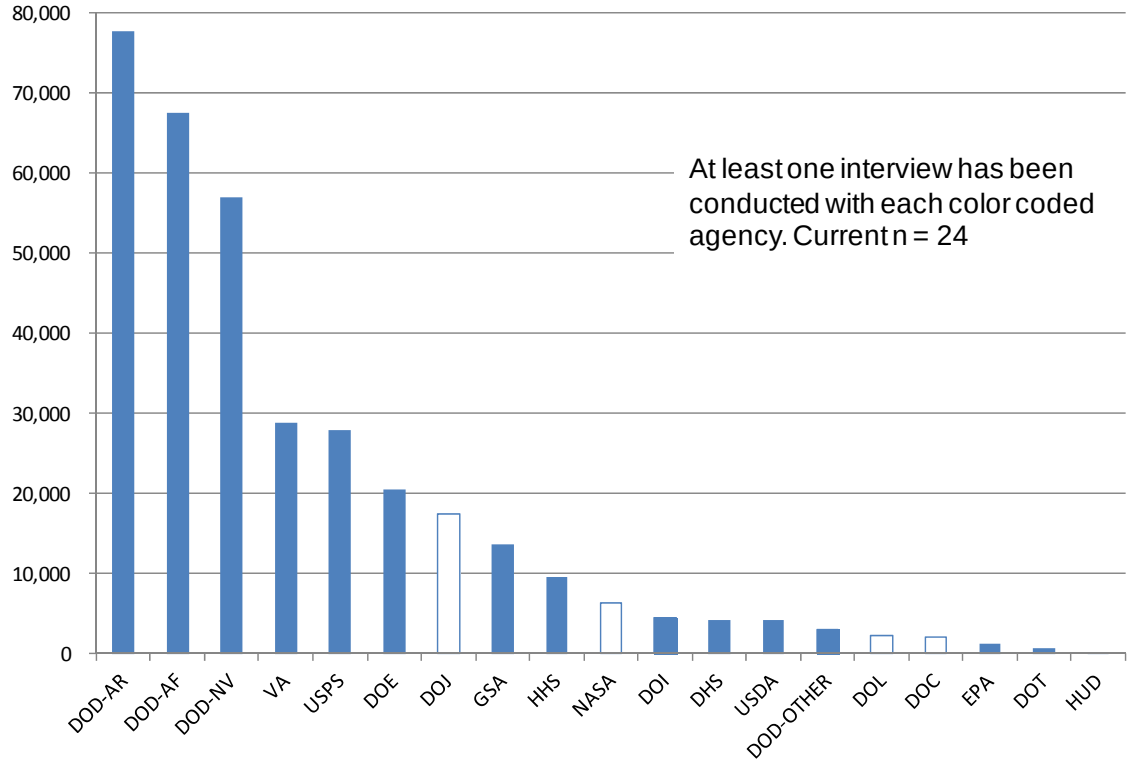
U.S. General Services Administration (2011). FY 2010 Federal Real Property Report: An Overview of the U.S. Federal Government's Real Property Assets. Federal Real Property Council.

Appendix A: Interview Methodology

In April 2012 the authors began a series of telephone interviews with federal procurement officials in order to get a better understanding of the variation across the federal sector regarding the procurement process for energy-consuming products. The protocol was developed with guidance from the literature on qualitative research (see, e.g., Rosenthal and Rosnow 2007), the input of four university social science researchers, and a pilot interview with a procurement specialist at Lawrence Berkeley National Laboratory (LBNL). Note that all of LBNL's human subjects procedures were followed for this interview methodology.

After sorting federal agencies based on their energy use in order to develop a prioritization scheme for interviews, potential interview subjects were identified from two lists and their related referrals (each subject was initially contacted by email). The first list was the 115 potential subjects identified for interviews in Alliance to Save Energy (2012), based on their role in high level procurement forecasts. The second list of 806 generally senior contracting officials was compiled by the authors from federal procurement directories maintained by the Small Business Administration (SBA) for five of the six areas of the country (the SBA does not maintain a directory for the sixth area). Figure 3 presents the breakdown of interview subjects by the energy use of their agency, with each color-coded agency represented by at least one interview.

Figure 3: Interview subjects according to the energy use of their agency



Before each telephone interview began, the interview subject was presented with a packet of figures and a table. The first figure was a diagram of the federal procurement system that was

developed by the authors from a literature review and focus group with FEMP EEPP program personnel conducted in March 2012. Much of the interview was spent discussing the subject's sense of how well this diagram represented the purchase process for energy-consuming products in his or her organization, and how the subject would alter that diagram to make it better represent the accurate purchase process; Figure 2 resulted from these discussions.

Each subject was also given a table listing the products covered under the FEMP EEPP program, as well as pages containing one of three sub-samples of 27 products that can be considered "indicators" of the program's product coverage. For the comparative energy savings of the FEMP EEPP products and the indicator products by category, see Figure 4. For an example of the visual anchor provided to interview subjects to represent the indicator subset's prices and lifetimes, see Figure 5. Each interview subject was asked to provide a "grand tour" of the typical purchasing process for each product in the sub-sample group they were assigned.

Figure 4: Comparative energy savings (mBtus in 2015) associated with categories of FEMP EEPP covered products and indicator product sub-samples used in interviews for this report, with numbers of products in each set listed in white.

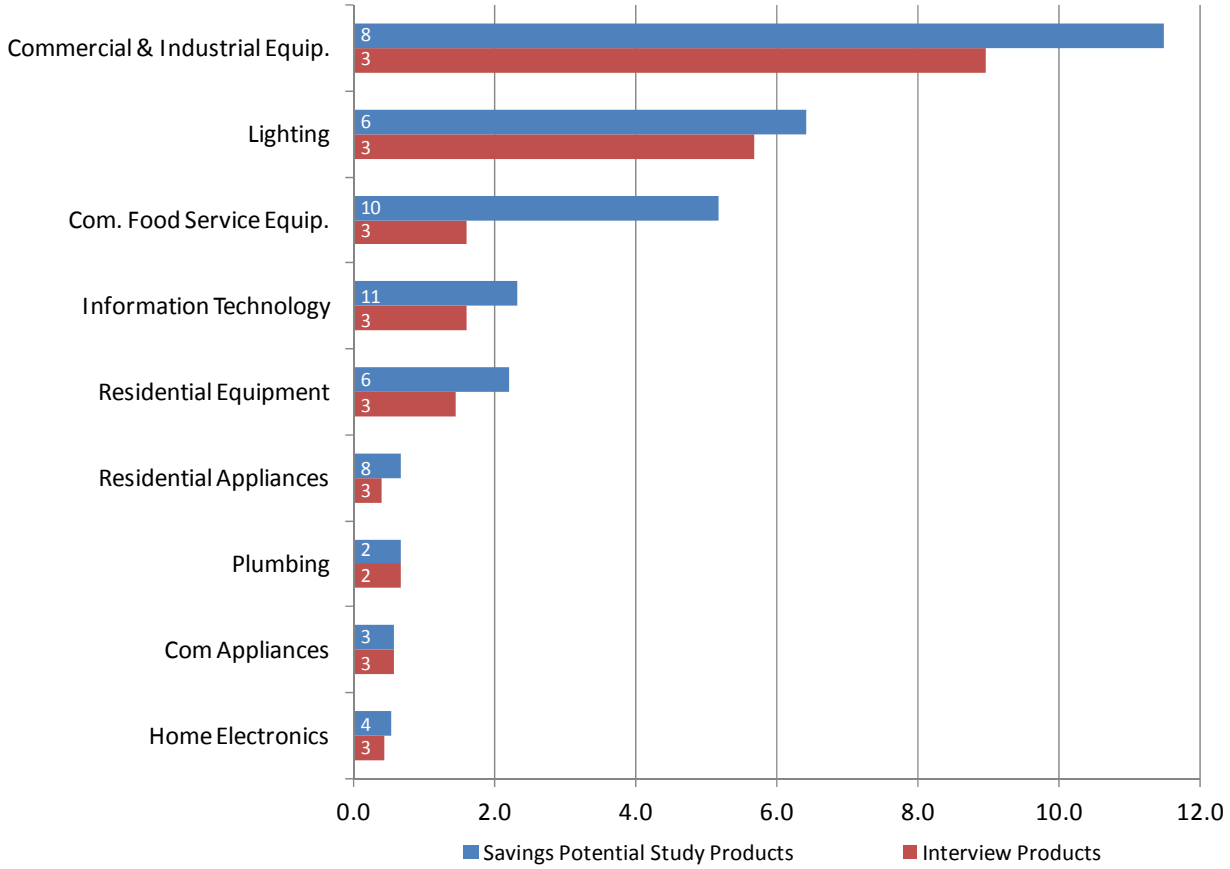
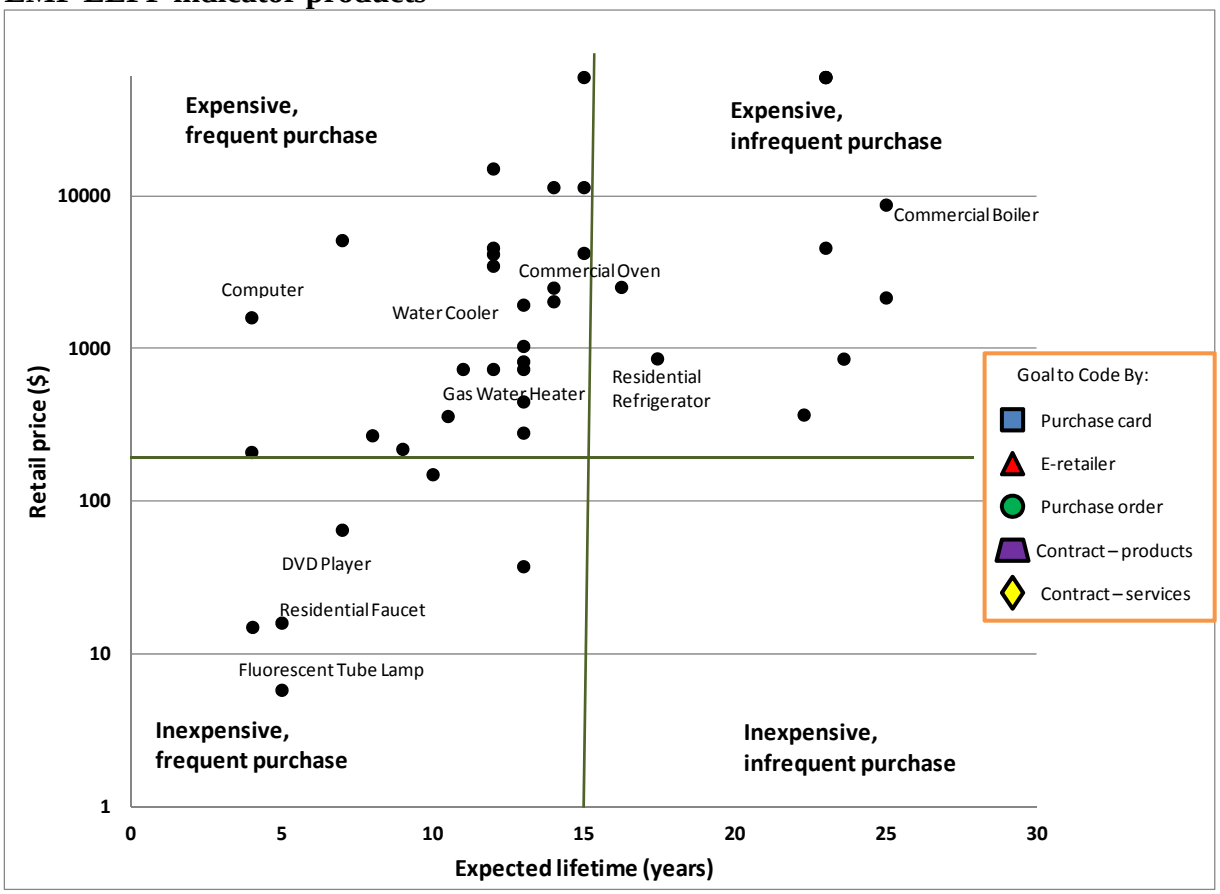


Figure 5: Example of scatter-plot presented to interview subjects for the "A" subset of FEMP EEPP indicator products



The final part of the interview methodology was to solicit suggestions from the interview subjects on how they would go about ensuring that the federal government only purchase energy and water efficient products. The collected suggestions of the interview subjects are presented in Appendix C.

Appendix B: FEMP EEPP Covered Products, with Contracting-Relevant Coding

Product Category	Product	Lifetime (years)	Price Bin	Product Classification[a]	Indicator Product Sub-Sample[b]
Commercial & Industrial Equipment	Air-Cooled Chillers	23	>$25K	1*	C
	Commercial Air-Source Heat Pumps	15	$3K – 25K	1*	—
	Commercial Boilers	25	3K – 25K	1*	A
	Commercial Central Air Conditioners	15	>$25K	1*	B
	Commercial Gas Water Heaters	10	$3K – 25K	1*	—
	Motors	18	<$3K	2B*	—
	Transformers	32	<$3K	2B*	—
	Water-Cooled Chillers	23	>$25K	1*	C
Commercial Appliances	Beverage Vending Machines	14	<$3K	--*	B
	Family-Size (Commercial) Clothes Washers	11	<$3K	2B*	C
	Water Coolers	10	<$3K	--	A
Commercial Food Service Equipment	Commercial (Air-Cooled) Ice Machines	8	$3K – 25K	1*	—
	Commercial Dishwashers	15	$3K – 25K	1*	—
	Commercial Fryers	12	>$25K	1*	—
	Commercial Griddles	12	$3K – 25K	1*	—
	Commercial Hot Food Holding Cabinets	12	$3K – 25K	1*	—
	Commercial Ovens	12	$3K – 25K	1*	A
	Commercial Refrigerators & Freezers	12	$3K – 25K	1*	B
	Commercial Steam Cookers	12	$3K – 25K	1*	—
	Pre-Rinse Spray Valves	5	<$3K	2*	C
	Water-Cooled Ice Machines	8	$3K – 25K	1*	—

Product Category	Product	Lifetime (years)	Price Bin	Product Classification[a]	Indicator Product Sub-Sample[b]
Home Electronics	DVD Players	7	<$3K	2	A
	Phones and Answering Machines	4	<$3K	2	—
	Set-Top & Cable Boxes	7	<$3K	--	C
	Televisions	10	<$3K	2B	B
Information Technology	(Computer) Printer	5	<$3K	1	—
	Computer Monitor	4	<$3K	1	B
	Copier	6	<$3K	1	—
	Desktop (Personal) Computer	4	<$3K	1	A
	Docking Stations	4	<$3K	1	—
	Enterprise (Computer) Servers	5	<$3K	1	C
	Fax Machine	4	<$3K	2	—
	Mailing Machine	5	<$3K	2	—
	Multifunction Devices	6	<$3K	1	—
	Notebook (Laptop) Computers - Tablet PCs	4	<$3K	1	—
	Scanners	4	<$3K	1	—
Lighting	Ceiling Fans	10	<$3K	2*	—
	Compact Fluorescent Lamps (Light Bulbs)	5	<$3K	2	C
	Decorative Light Strings	4	<$3K	2	—
	Exit Signs	10	<$3K	1*	—
	Fluorescent (Tube) Lamps	7	<$3K	2	A
	Fluorescent Ballasts	14	<$3K	1*	B
	Fluorescent Luminaires	15	<$3K	1*	—
	Industrial/Commercial Luminaires	15	<$3K	1*	—
Plumbing	(Residential) Lavatory Faucets	7	<$3K	2*	A, B
	Showerheads	7	<$3K	2*	C

Product Category	Product	Lifetime (years)	Price Bin	Product Classification[a]	Indicator Product Sub-Sample[b]
Residential Appliances	Clothes Washers	13	<$3K	2B	—
	Dehumidifiers	12	<$3K	2	—
	Microwave Ovens	10	<$3K	2	C
	Residential Dishwashers	13	<$3K	2B	—
	Residential Freezers	22	<$3K	2B	—
	Residential Refrigerators - Full	17	<$3K	2B	A
	Room Air Cleaners	9	<$3K	2	—
	Room Air Conditioners	11	<$3K	2B	B
Residential Equipment	(High Efficiency) Gas Storage Water Heaters	13	<$3K	2B*	A
	(Residential Gas) Furnaces	24	<$3K	2B*	B
	(Residential) Air-Source Heat Pumps	16	<$3K	2B*	C
	(Residential) Boilers	25	<$3K	2B*	—
	(Residential) Central Air Conditioners	14	<$3K	2B*	—
	Electric Heat Pump Water Heaters	13	<$3K	2B*	A
	Electric Storage Water Heaters	13	<$3K	2B*	A
	Gas Condensing Water Heaters	13	<$3K	2B*	A
	Whole-Home Tankless Water Heaters	13	<$3K	2B*	A

[a] Codes denote the following:

(1) Contracting officers are assumed to be involved in the purchase of a single unit of these products, either because of a GWAC or because of the product's price point;

(2) Contracting officers are not likely to be involved in the purchase of a single unit of these products because their average prices are below the micro-purchase threshold;

(B) Due to the product price point, contracting officers are assumed to be involved when these products are purchased in a batch, which we define here as a set of 10 or more units;

(*) These products are assumed to be under the control of the building owner, which will not be likely to be FAR compliant for the purposes of EO 13514 for buildings that are federally managed but not federally owned (79% of federally occupied floor space is federally owned);

(--) These products are rarely bought by the federal government, according to interviews.

[b] A, B, and C refer to the indicator product sub-sample which interview subjects were asked to provide "grand tours" of. Products with "—" were not indicator products.

Appendix C: Collected Suggestions of Interview Subjects

This appendix provides a summary of suggestions that emerged from the interviews, collected into groups based on major themes. Note that while many interview suggestions refer to actions that are not directly within the FEMP EEPP program's control, these suggestions provide a description of the policies and tools that procurement personnel feel they need in order to ensure the purchase of energy efficient products. It may be possible for the FEMP EEPP program to partner with other programs to enact some of the more ambitious and overarching suggestions discussed below.

Defaults

- Emphasize that products must be ENERGYSTAR or FEMP-designated unless proved unsuitable (i.e. streamline the process to buy efficient products and make it more difficult to buy baseline efficiency products).
- Set up procurement systems to favor energy efficient products (e.g. configure GSA Advantage! to display compliant products first on list).
- Restrict choices to energy-efficient models and/or automate procurement of required efficiency level.

The FEMP EEPP program is already taking several actions that will facilitate the process of making energy-efficient products the default choice (i.e. reviewing GSA Advantage! offerings and accuracy of product identification as compliant/subject to FEMP EEPP requirement)

Target Key Actors

- Engage vendors to increase availability and improve ease of identification of energy efficient products
- Engage end users and/or specifiers because contracting officers will rarely override what the specifier requests.
- Incorporate information on energy efficient appliances into p-card training courses that have to be taken every few years by p-card holders.

Contracting personnel manage their ongoing training through the Federal Acquisition Institute Training Application System (FAITAS). Coursework at the Defense Acquisition University is readily accessible for procurement officials in military agencies, and is available on a more limited basis for procurement officials in civilian agencies. Depending on the agency, civilian agencies have agency-specific training available to them, in addition to centralized training under the Federal Acquisition Institute and its private contractors, such as Management Concepts International. Such pre-existing training courses and programs for federal procurement personnel provide venues through which the FEMP EEPP program can evaluate knowledge of energy-efficient procurement requirements and present an ideal platform for exposing procurement personnel to additional training focused on FEMP EEPP program priorities.

Simplification

- Simplify the process as much as possible to increase the likelihood of compliance.
- Simplify federal acquisition in general (e.g. reduce the FAR from 2,000 pages to a more manageable size).
- Provide a simple tool to do quick, reasonable cost benefit analysis or life-cycle cost calculations for different product efficiency options.

Simplification can be largely addressed by changing the defaults and engaging key actors. When procurement systems make it inherently more difficult to make a poor efficiency choice and the primary actors involved in the process are well-informed, the odds that purchases will be compliant are improved.

Reporting

- Make efficient procurement a more effective mandate by requiring agencies to track and report their progress toward buying energy efficient products.

Visibility and Outreach

- Increase outreach to contracting officers.
- An interagency working group on energy efficient procurement (across different agencies, national labs, etc) could raise awareness and improve understanding of FEMP EEPP requirements.
- Use media to tout advantages of energy efficient products.
- Long-term exposure to energy-efficiency requirements may be necessary to achieve compliant procurement.
- FEMP could partner with ENERGYSTAR and/or other environmental programs to increase exposure and streamline messaging regarding energy efficiency.
- Increase the clarity of FEMP EEPP's message (particularly in the case of FEMP – designated products).
- Increase the visibility of FEMP EEPP at conferences for procurement societies and organizations.

The FEMP EEPP program should strengthen its connections with other agencies and groups involved in energy efficiency and environmental labeling to look for synergies in research and goals (i.e. ENERGYSTAR, WaterSense, energy efficiency standards, etc). To increase effectiveness, the visibility of FEMP EEPP needs to be increased. The ENERGYSTAR name and symbol are generally well-recognized, but FEMP is not. “FEMP-designated” should, but does not, carry the same weight and meaning as “ENERGYSTAR qualified” to a federal buyer.

Resources such as the *Journal of Public Procurement* of the National Institute of Governmental Purchasing (a professional association of government procurement officials in the United States

and Canada) provide opportunities to gain information on current issues, concerns, and practices in procurement, as well as platforms for disseminating information about FEMP EEPP.

Incentives

- Provide incentives for compliant purchasing, including recognition and awards for agencies that perform particularly well.
- Agencies could receive budget credit for energy cost savings expected from buying energy efficient products (e.g. buying products with expected annual savings of $100 leads to an additional $100 in next year's budget).
- Emphasize the potential monetary savings of compliant products.

Although FEMP cannot directly reward, punish, or mandate reporting, it can leverage other related policies (e.g. EISA 2007, by pointing out that 30% by 2030 is required and that energy efficient products can be a part of strategic agency actions to meet the target). Highlighting simple case studies that confirm savings on product webpages may help to bring home the energy cost savings message.