

**Public Procurement of
Energy Saving Technologies
in Europe
(PROST)**

**Supplemental Report on
Programs and Policies in the U.S.**

**Task 2a – Current Public Sector Purchasing, Building,
and Replacement Practices**

Task 4b – PICO Feasibility Study

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1 Executive Summary

1.1 Energy Efficiency in Current Public Sector Purchasing, Building, and Replacement Practices

1.2 Public Internal Performance Contracting (PICO)

2 General Information on the Political, Legal, and Economic Framework for Energy-Efficient Public Purchasing

2.1 National Targets for Energy Efficiency and/or Climate Protection in the Public Sector

At the national level, targets for energy savings and renewable energy use have been in place for many years. As recently updated by Executive Order 13123 (Office of the President 1999 – see Appendix A), these policies call on federal agencies to:

- Reduce energy intensity (energy per sq. meter of floorspace) in federal facilities by 30% in 2005 and 35% in 2010, compared with 1985 levels.
- Reduce greenhouse gas emissions from facilities and other operations (mainly vehicles and “weapons platforms”) by 30% in 2010, compared with 1990 levels.
- Reduce energy intensity in industrial and laboratory facilities (based on appropriate floorspace or output indicators) by 20% and 25% in 2005 and 2010, respectively, compared with 1990
- Increase the use of renewable energy and purchases of “green power,” including 2000 solar installations in federal facilities by 2000 and 20,000 by 2010.
- Reduce petroleum use and implement cost-effective water-saving measures in federal facilities.
- Reduce overall primary (source) energy use, greenhouse gas emissions, and air pollutant emissions by unspecified amounts, from both facilities and other operations.

Legislation introduced in both houses of Congress would update these energy savings goals and extend them to 2020. The proposed legislation would also require that a minimum percentage of all federal electricity purchases be generated from renewable energy sources: 3% in 2002 increasing to 7.5 % in 2010. A summary of current legislative proposals (HR 4 and S 1358) is available on line at <http://thomas.loc.gov/>.

A number of other public agencies at the state and municipal level have adopted their own goals for energy savings and renewable energy use. For example, New York Governor George Pataki recently directed state agencies to achieve energy savings of 35% in all owned or leased buildings by 2010, compared with 1990 levels. Additional reductions (to be specified later) are aimed at lowering peak electricity demand (Pataki 2001). New state-owned buildings are required to be 20% more efficient than the levels required for all new construction under the NY energy building code.

2.2 Laws and Regulations Governing Product Purchasing and Investments by Public Institutions

Beginning with the first oil embargo in the mid-1970s, the federal government has enacted legislation and administrative regulations dealing with energy efficiency in public facilities and purchasing. The latest element was added as recently as summer 2001, in the form of an updated Executive order to government agencies to purchase devices with low-standby power. The most recent comprehensive legislation on federal energy management is from the Energy Policy Act of 1992 (see summary and link to full text at <http://www.eren.doe.gov/femp/resources/epacintro.html>).

In addition to federal legislation, a series of Presidential Executive Orders direct federal agencies to undertake a specific activities to promote energy efficiency in their facilities and operations, including government purchasing. Earlier directives were consolidated and updated in 1999 as Executive Order 13123, “Greening the Government Through Efficient Energy Management“ (<http://www.eren.doe.gov/femp/resources/exec13123.html>) This Executive Order directs agencies to select Energy Star labeled products and “...other products in the upper 25 percent of energy efficiency as designated by FEMP,“ provided that such products are cost-effective on a life-cycle basis (for the full text of this section see Appendix A).

This Executive Order 13221, "Energy-Efficient Standby Power Devices" was issued by President Bush on July 31, 2001, to encourage Federal agencies to discontinue use of "vampire devices" and begin using energy conservation devices. In addition to the purchasing provisions of Executive Order 13123, the recent Executive Order 13221 directs federal agencies to buy products with low levels of standby power (Appendix A).

Federal regulations affecting federal agency operations and energy efficiency in general are on-line at http://www.access.gpo.gov/nara/cfr/waisidx_00/10cfr436_00.html while the specific regulations on government purchasing (Federal Acquisition Regulations, FAR) are found at <http://www.arnet.gov/far/> . Finally, several of the larger agencies, such as the Department of Defense and Department of Energy, publish their own acquisition rules to interpret and apply the FAR to their specific requirements.

2.3 Policy and Programs on Energy Efficiency in Public Institutions

2.3.1 Federal Programs

At the federal level, Executive Order 13123 includes a number of specific directives to federal agencies to follow, in the process of achieving their overall energy savings goals. The Order assigns a broad coordination and technical assistance role to the Department of Energy’s Federal Energy Management Program (FEMP).

Major elements of the FEMP program include:

- facility on-site audits to identify energy- and water-saving measures,
- technical support in planning and undertaking energy-savings performance contracts (ESPCs) using Energy Service Companies (ESCOs) that have been pre-approved to simplify federal contracting,
- design assistance to help agencies build more energy-efficient and sustainable new (or renovated) facilities,
- technical assistance and (limited) financial support for renewable energy projects and “green power” purchasing,
- recommendations on purchasing energy-efficient products that qualify for the Energy Star label or – for categories not covered by Energy Star – products in the top 25th percentile of the market in terms of energy efficiency,
- staff and contractor training on all the above topics, and
- tracking and reporting of government-wide energy efficiency and renewable energy program activities and accomplishments.

FEMP promotes energy-efficient purchasing by helping federal agencies comply with the energy-efficient purchasing requirements of the 1992 Energy Policy Act and the two Executive Orders by publishing written guidance defining efficiency levels at the upper quartile (25th percentile) of the market for about 40 product types, including a number of Energy Star labeled products. FEMP has distributed over 3500 copies of the looseleaf binder “Buying Energy Efficient Products“ in response to requests from federal buyers and others; the same information is published on-line at <http://www.eren.doe.gov/femp/procurement>.

The EPA/DOE Energy Star Purchasing Program encourages similar policies and practices for energy-efficient purchasing by state and local agencies, with the help of the utility-sponsored Consortium for Energy Efficiency (<http://www.cee1.org/gov/purch/purch-main.php3>).

2.3.2 State and Local Programs

State Energy Offices are responsible for planning and implementing state level energy efficiency programs, mainly with funding from US DOE. In several of the larger states such as California and New York, these programs are also supported by state appropriations and “public benefit“ funds collected from utility ratepayers. These state programs mainly target efficiency investments and energy management practices by consumer and businesses, although several states also pursue energy savings in public buildings and government purchasing.

States such as Texas, Iowa, and California have financed energy-saving capital improvements in public buildings through state revenue bonds or internal loans from revolving funds. In the 1970's and 80's, many states also offered tax credits for homeowners and businesses to invest in energy efficiency or renewable energy projects. Many of these credits have now been eliminated, but the state of Oregon still provides an extensive array of tax credits for homeowners and businesses to purchase efficient appliances, equipment, and renewable energy systems. (For examples, see <http://www.energy.state.or.us/res/tax/taxcdt.htm> and <http://www.energy.state.or.us/bus/tax/taxcdt.htm>.) Links to the State Energy Offices are at <http://www.naseo.org/links/states.htm> while a description of state programs undertaken jointly with US DOE funds (not limited to the public sector) is at http://www.eren.doe.gov/buildings/state_energy/map.html.

Several states also sponsor their own energy efficiency research and technology deployment programs, with funding from state appropriations or utility ratepayers. In some cases (e.g., New York and California) these RD&D functions are managed by the State Energy Offices; other states such as Wisconsin, Florida, North Carolina, and Iowa, have created separate RD&D agencies. In the aggregate, these state-managed research and technology-transfer programs spend about US\$200 million/year, mainly aimed at energy efficiency and renewable energy technologies and practices. This is almost the same scale as the entire US DOE budget for energy efficiency research. Several states have formed a non-profit organization (ASERTTI) to coordinate their energy research planning and implementation (<http://www.energy.wsu.edu/cfdocs/asertti/default.cfm>).

At the municipal level, DOE's support for community-based programs is funded mainly under the "Rebuild America" program (<http://www.eren.doe.gov/buildings/rebuild/>). Because of significant recent growth in spending on school construction and renovation, DOE has put a special emphasis on energy efficiency in new and existing school buildings (<http://www.eren.doe.gov/energysmartschools/>). In prior years, DOE also provided direct funding for energy management programs by municipal agencies; these activities are described at http://www.eren.doe.gov/buildings/municipal_energy.html.

2.3.3 Energy Labels and Standards

Perhaps the best-known voluntary program in the US for promoting energy efficiency is Energy Star. The US Environmental Protection Agency (US EPA) created Energy Star in 1992 as a joint government/industry marketing and labeling program for efficient office equipment with a low-power "sleep" mode. Since then, the program has expanded, with sponsorship by both US EPA and US DOE, to include voluntary energy efficiency labeling of more than 30 types of energy-efficient products (<http://www.energystar.gov/products/>). In 2000 there were over 1600 manufacturing and retailing Energy Star partners, and an estimated 120 million labeled products sold (US EPA 2001). In addition to product labels, Energy Star now includes labeling of energy-efficient homes, as well as performance benchmarking for several types of commercial buildings and selected industrial processes.

Based on a directive in Executive Order 13123, several federal agencies have adopted Energy Star criteria as a basis for energy efficiency on new federal construction, both non-residential buildings and military housing. Private industry partners contribute to a national advertising and “brand-awareness” campaign to build on the current level of consumer recognition of the Energy Star logo – already about 40%, according to surveys. Recently, the European Union and Japan adopted the Energy Star label for office equipment, and Canada has now joined the program for all labeled products. EPA has estimated savings of 42 billion kWh/year from Energy Star labeled products in use as of 2000; 80% of total savings were attributed to office equipment alone (EPA 2001).

There is a close link between the Energy Star label and government purchasing: the FEMP criteria for energy-efficient purchasing are harmonized with Energy Star, resulting in both:

- a clear market message (and performance target) for manufacturers and distributors, and
- an easier path for government buyers to identify efficient products by simply looking for the Energy Star label and logo.

Moreover, all Energy Star labeled products are also included in a Web-based list, easily accessible to both government or institutional purchasers and to individual consumers (www.energystar.gov/products). Finally, as states such as New York, California, and Massachusetts begin to target their own purchasing to Energy Star criteria, this adds to the demand-pull effect of many large buyers, all focused on common criteria for energy performance.

In addition to these market-oriented programs, US DOE manages national programs for mandatory appliance and equipment testing, standards, and comparison-labels. DOE also issues recommended building energy efficiency standards for new residential and non-residential buildings, and provides grants, training, and technical assistance to states and local authorities to adopt these efficiency provisions into local building codes and enforce compliance. A modified version of the DOE recommended building standards are mandatory for all new federally owned buildings (including major renovations). US DOE codes and standards programs are described at http://www.eren.doe.gov/buildings/codes_standards/index.htm. An overview of appliance labeling and standards in the US, compared with those in other countries, is at <http://www.clasponline.org/standard-label/programs/country1.php3>.

As with Energy Star, these national requirements for appliance and equipment rating and labeling provide an essential foundation for energy-efficient government purchasing, for several reasons:

- they are based on industry-wide energy test methods,
- produce appliance labels which help buyers to compare energy performance, and

- create publicly accessible data bases on energy use and efficiency which can be used both to establish purchasing criteria and to help buyers identify products that meet or exceed a given performance level.

2.4 Key Statistical Data

2.4.1 Energy Use and Building/Equipment Stocks

US primary energy use in residential and commercial buildings is about 38,000 PJ (e15 J) in resource terms, including about 18,100 PJ of electricity system losses (<http://btscoredatabook.eren.doe.gov/>). Of this total, about 670 PJ or almost 2%, is used in federal buildings (DOE/FEMP 2001). An additional 2100 PJ of primary energy is used in state and local government buildings, bringing the public sector total to about 8% of all buildings energy.

The 670 PJ of primary energy used in federal buildings serves an estimated 500,000 structures with total floorspace of 290 million sq. meters. Most of this floorspace is in offices and other non-residential uses (170 million sq. meters), but the total also includes some industrial facilities and about 300,000 housing units owned and operated by the US military for families of military personnel, along with 400,000 lodging spaces in military barracks. A significant effort is underway to upgrade or replace older family housing units through contracts with private developers, who build or renovate housing units and then rent them to military families (<http://dticaw.dtic.mil/prhome/housing.html>). The Department of Defense pays the energy costs for all military housing units, both directly owned and “privatized,” and thus has an interest in improving their energy efficiency. Each military branch has announced policies to increase building envelope efficiency and to purchase Energy Star or other (FEMP-recommended) efficiency heating and cooling equipment, lighting, and appliances for both new and renovated housing units.

Outside the federal sector, state and local agencies own and occupy about 980 million sq. meters of non-residential floorspace, including offices, schools, prisons, and other building types.¹ Schools, colleges, and universities represent about 50% of total state and local government floorspace. School buildings tend to be less energy-intensive than other non-residential buildings, and are often occupied only 9 months/year. (http://www.eia.doe.gov/emeu/cbecs/detailed_tables_1999.htm)

In summary, government-owned floorspace represents about 18% of the total non-residential building stock, or 1,150 million sq. meters. There were about 16.3 M workers in government-owned non-residential buildings, or about 22% of total workers (75.8 M) in all commercial buildings (<ftp://ftp.eia.doe.gov/pub/consumption/commercial/ce95tbls.pdf>).

¹ Government-leased space is not included in these totals.

In addition to these non-residential buildings, there are an estimated 3.4 million public housing units in the US. These represent about 10% of rental housing units, but only about 3% of all 101.5 million housing units, both owner-occupied and rented (DOE /EIA 2000; <http://www.eia.doe.gov/emeu/recs/>). This is a significantly smaller fraction of the US housing stock, compared with public (social) housing in European countries. Public housing in the US are occupied by low-income families and senior citizens, with the federal government subsidizing rent and utility costs. However, the housing units themselves are built, owned, and managed by local Housing Authorities. The combination of split incentives among these federal and non-federal public agencies, along with the demographics of the public housing population, make it difficult to improve envelope energy efficiency or to encourage the widespread purchase of efficient lighting, appliances, and equipment. One notable exception was a very successful program to organize volume purchasing of high-efficiency refrigerators and compact fluorescents (CFLs) by the New York Housing Authority and several other large-city housing agencies (<http://www.cce1.org/gov/sear/sear-main.php3>).

2.4.2 Energy Efficiency Investments and Savings in Public Buildings

The FEMP Annual Report includes data on annual federal investments in efficiency improvements in buildings (DOE/FEMP 2001). Investment funds come from three main sources:

- annual appropriations as part of agencies' capital and operating budgets,
- third-party financing authorized by Congress through energy-savings performance contracts (ESPCs),
- and utility-financed energy services contracts and rebate programs.

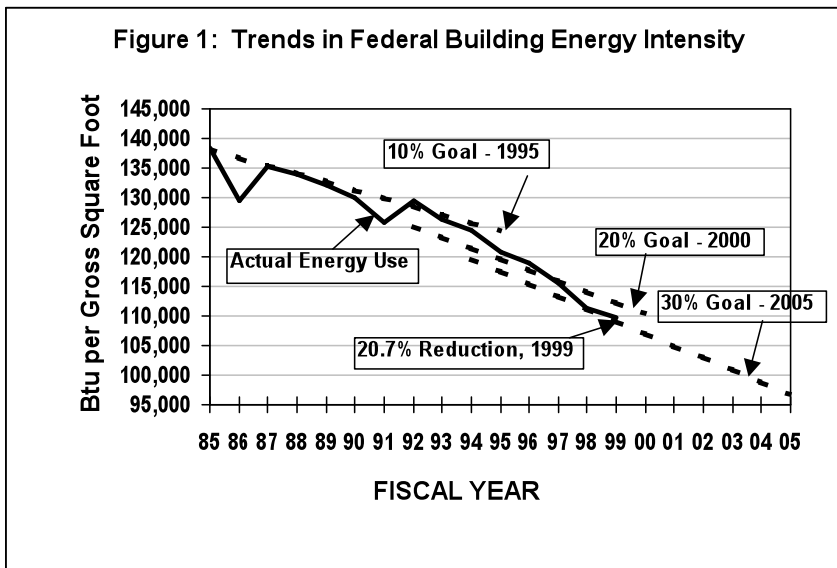
Agency-reported expenditures for energy efficiency projects in existing buildings were US\$205 million in FY 1999, slightly above the inflation-adjusted average for the period 1985-99 (budgeted amounts fluctuate significantly from one year to the next). Third-party financing under ESPCs (performance contracts) totaled US\$44 million in FY 1999. More recent data are not available, although the number of ESPC projects continues to grow. Although FEMP has not published data on utility-financed energy services projects, the total may be as large as for non-utility ESPCs. Utility and state rebates paid to federal customers for energy-efficient purchases were over US\$2.6 million in FY 1999. Total rebate payments to federal agencies have likely increased since then, with the creation of ratepayer-funded "public benefit funds" for energy efficiency in more regions of the country.

The FEMP Annual Report also describes federal agency program activities and reported progress toward the mandated energy savings goals (e.g., 35 % reduction in building energy intensity from 1985 to 2010). The latest Report, for Fiscal Year (FY) 1999, shows net (on-site) energy per sq. meter down about 21% from 1985 to 1999. This is consistent

with the 30% savings goal for 2005 (**Figure 1**). However, this reduction includes two effects other than energy efficiency:

- a 20% reduction in total floorspace of Department of Defense (DoD) facilities, as older military bases were closed or converted to other use; and
- the increased share of electricity as a percent of total buildings energy use, which makes it important to consider electricity system losses in addition to on-site consumption. (When measured in primary (resource) energy, including electricity system losses, energy intensity declined only 8% over these 14 years.)

These trends in federal building energy use exclude “energy-intensive facilities” containing laboratories and industrial process uses, which represent about 20% of the total. For energy-intensive facilities, total (site) energy use actually increased 56% from 1985 to 1999.



Total spending for energy in federal facilities was US\$3.4 billion in 1999, representing a 40% decrease in since 1985, in constant dollars. In addition to a 28% energy savings from efficiency and further reductions from military base closures, the average unit price paid for energy declined about 16% from 1985 to 1999.

The FEMP Annual Report, including data tables and graphs of energy use trends, is available on line at http://www.eren.doe.gov/femp/aboutfemp/ann99_report.html.

Outside the federal sector, the estimated value of all investments in capital improvements in residential and commercial buildings – not just those related to energy efficiency – was about US\$250 billion in 1999 (<http://btscoredatabook.eren.doe.gov/>). Comparable stockwide data on energy-related improvements are not available, but an ongoing LBNL

study has tracked project investments and reported energy savings for private Energy Service Companies (ESCOs) for over five years (Goldman et al. 2000; Goldman 2001). This study finds that total ESCo project investments have grown steadily over the past decade, now approaching US\$2.0-2.5 billion as of 2000, or about 1% of all US capital investments in building improvements.

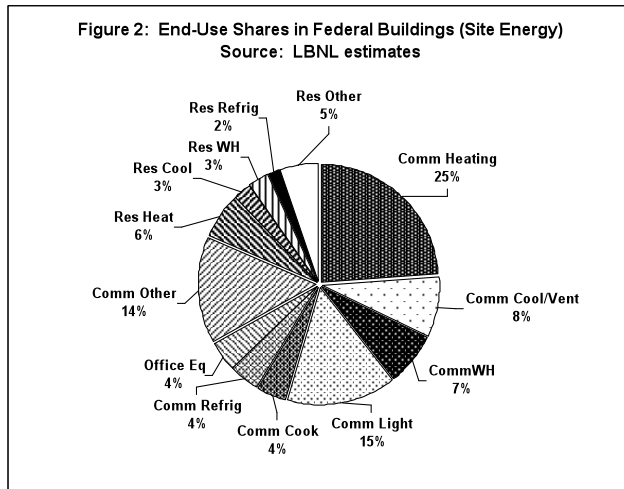
The LBNL study tracks a subset of ESCo projects, representing about \$2.6 billion of total investment and nearly 1500 projects to date. About 75% of total project dollars were invested in public or institutional buildings (government facilities, schools, hospitals, public housing). Schools alone accounted for about one-third of the national total, as well as the lowest median cost of saved energy (about US\$0.02/kWh for electricity savings, compared with US\$0.025 for other government facilities and US\$0.043 for projects in privately owned facilities). Average project costs (\$/sq.m.) and the average number of retrofit measures are also highest in schools and state/local government facilities, a further indication that these sectors offer the largest energy savings potential. Finally, the LBNL study noted a significant trend toward reduced reliance in ESCo projects on performance-based contracting, from over 90% in the pre-1996 period to under 75% in the past five years. Between these two 5-year periods, shared-savings contracts shrank from 27% to only 3%; guaranteed-savings contracts (already the most common category) increased a further 5%; and fixed-fee services (design + build) have more than doubled their share to about 28% of total dollars.

2.4.3 Government Purchasing Data and Energy Savings Estimates

The public sector – including federal, state, and local agencies – purchases about 10% of energy-using products in the US; the federal government by itself is the largest buyer in the world for many products. Federal purchases of energy-related products are roughly US\$12 billion/year, of which about one-fourth (US\$4 billion) are building-related equipment and appliances covered by Energy Star labels or FEMP purchasing recommendations (Casey-McCabe 1995). Within this US\$4 billion, approximately 10% is for lighting, 30% for office equipment, 15% for residential and commercial appliances, 25% for heating and cooling equipment, and the remaining 20% for building materials and miscellaneous products, according to LBNL estimates (**Figure 2**). Although the federal government is often the largest single customer for a given product, the federal market share is still only about 1-2% of national sales for most residential appliances and heating/cooling equipment, increasing to 3-5% for commercial lighting and office equipment. These ratios approximate the fraction of federal floorspace in all US buildings.

The highly decentralized nature of federal purchasing makes it difficult to compile hard data on purchases of energy-using products, except in very aggregate terms. Federal purchasing data are reported, not in physical units, but as total dollars spent for broad categories of products and services; reporting is also limited to purchase transactions over \$25,000. Moreover, a significant amount of energy-using equipment is specified and acquired indirectly, through federal contracts for facility design, construction, maintenance, or leasing, as well as ESCo contracts. Although contractors often specify

and install equipment in federal facilities, there is virtually no reported information on the volume or efficiency features of these contractor-supplied purchases.



While federal purchasing of energy-related products, by itself, plays an important role in the US market, in the aggregate purchases by state and local agencies (including schools) are about 3-5 times larger. As noted earlier, these non-federal government and institutional buyers, as well as large corporate purchasers, are targeted by the Energy Star Purchasing Initiative.

Absent detailed data reports on federal purchases, an LBNL study developed a simple model of purchasing volume for selected energy-using products, based on equipment stocks (derived from floorspace and estimated equipment intensities) combined with average equipment replacement rates. The study then checked the reasonableness of these federal purchasing estimates against the implied federal share of total US sales for that product. The resulting estimates of annual purchase volume, along with assumptions about annual operating hours and typical efficiency gains for the purchased products, were used to estimate energy savings from government purchasing of selected products (Harris and Johnson 2000; on-line at <http://www.dc.lbl.gov/~harris/GovernmentPurchasing.pdf>).

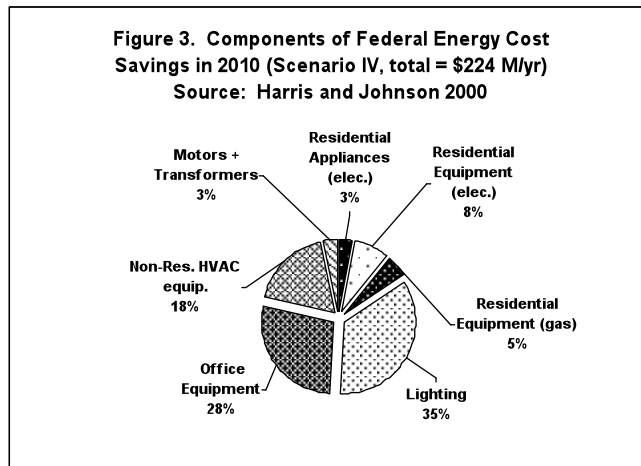
For the federal sector, the study includes detailed results for 21 products, including many Energy Star labeled products (residential appliances, space heating and cooling equipment, and office equipment), lighting technologies, and water-saving products. A less detailed analysis covers federal purchases of larger non-residential heating and cooling equipment, which account for about 20% of total savings.² The study considered four scenarios, representing different levels of assumed federal agency compliance with energy-efficient purchasing policies between 2000 and 2010.

Within the federal sector, combined savings in 2010 for the two groups of products range from 11 to 44 PJ/year (e^{15} J, site energy, excluding electricity system losses) for the four scenarios. This represents about \$160-620 million/year in reduced federal energy costs. The “most likely” scenario (IV) assumes that federal purchasing of efficient products

² Since the study was completed, additional product categories have been added to both the FEMP and Energy Star labeling program; these are not included in the LBNL savings estimates.

increases from about 20% today to 80% compliance by 2010; this yields savings of 15.6 PJ/year in 2010, worth about \$224 M in reduced federal energy costs (at today’s electricity and fuel prices). In this scenario, savings from federal purchasing would also amount to 4% of total energy use in federal buildings, and contribute 10% of the required federal goal to reduce building energy intensity 35% (from 1985 levels) as of 2010.

The contributions of each major type of equipment to total federal savings are shown in **Figure 3**. This breakdown uses energy cost savings rather than site energy, since the relative costs and greenhouse gas impacts per MJ of electricity and per MJ of fuel differ dramatically when expressed as site energy rather than primary energy (including electricity system losses). Figure 3 shows that purchases of energy-efficient lighting



products alone (mainly improved fluorescent luminaires and ballasts) account for about one-third of all energy cost savings in 2010. Energy Star office equipment with low standby power is a second important source of total savings – provided that the equipment is properly set up, with power saving features “enabled.” Purchases

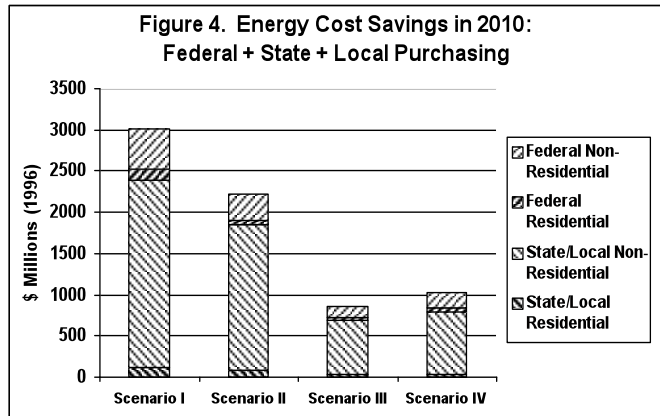
of efficient non-residential HVAC equipment are a third major source of the savings shown in Figure 3.

The study also estimated savings for energy-efficient purchasing by state and local agencies (including schools and public universities); these are 3-4 times larger than corresponding federal savings for the four scenarios. For the “most likely“ scenario, the study estimated annual savings in 2010 for state and local purchasing at 48.7 PJ (site energy), worth about US\$795 billion/year (at today’s energy prices). The distribution of state/local government savings, by type of equipment, differs somewhat from that of the federal government, due to a different composition of the building stock (e.g. the importance of school buildings) and somewhat different energy end-use shares in the state/local sector.

Combined estimates of energy cost savings in 2010 by both federal agencies and state/local governments are shown in **Table 1** and **Figure 4**. Estimated savings for all government-sector purchasing range from US\$850 million to over US\$3 billion/year for the four scenarios; with state and local agencies responsible for about 80% of this total. Scenario IV (“most likely“) assumes a continuing, successful effort to implement energy-

efficient purchasing at all levels of government which achieves annual energy cost savings to the public treasury in excess of US\$1 billion by 2010, based on saving 18 TWh/year plus 2 million GJ of fuel. Savings from non-residential equipment purchased by government agencies are significantly greater than savings from residential products, which are purchased mainly for military housing (federal), public housing and college dorms (state/local), and for smaller buildings at all levels of government.

Greenhouse gas (CO₂) emissions reductions associated with these energy savings closely



follow the patterns of dollar cost savings. Projected annual reductions in 2010 range from 2.4 to 8.6 million metric tons of carbon (MMT_C) for the four scenarios, for purchasing at all levels of government, combined. Carbon savings amount to 2.9 MMT_C /year for the “most likely” case (Scenario IV).

Table 1. Summary of Annual Energy Cost Savings in 2010 from Energy-Efficient Government Purchasing: Federal, State, and Local (US\$ millions)

	Scenario I - “Max Tech,” Full Penetration	Scenario II – Recommended Efficiency, Full Penetration	Scenario III – Recommended Efficiency, Rising Penetration	Scenario IV - Above-Recommended Efficiency, Rising Penetration
A. Federal Residential <i>(military + civilian housing)</i>	\$ 129	\$ 57	\$ 24	\$ 44
B. Federal Non-residential <i>(offices, other)</i>	\$ 493	\$ 324	\$ 135	\$ 180
C. State/Local Residential <i>(public housing)</i>	\$ 123	\$ 77	\$ 29	\$ 38
D. State/Local Non-Residential <i>(offices, schools, hospitals, other)</i>	\$ 2268	\$ 1770	\$ 664	\$ 757
TOTAL GOVERNMENTAL COST SAVINGS	\$ 3013	\$ 2228	\$ 853	\$ 1019

3 Discussion: US Experience with Energy Efficiency in Public Institutions

3.1 Public Purchasing of Energy-Efficient Appliances and Products³

In many countries, programs to promote energy efficiency have relied primarily on training and education, technical assistance, and financial incentives directed toward the design, financing, and completion of projects. While this approach has resulted in significant improvements in the energy consumption of individual buildings, and in some cases has changed entire building practices, it is a cost-intensive and time-consuming method of introducing energy efficiency. Promoting energy efficiency through a project-centered approach is often difficult due to the limited amount of utility and public funding available for energy-efficient capital projects within public, private, and institutional sectors. Even the introduction of private, third-party funding and outside technical expertise through energy services companies (ESCOs) may not fully resolve the constraints on energy-saving capital projects. Among other constraints, ESCo contracts are generally complex and time-consuming to negotiate. “Transaction costs“ for federal ESCo contracts are such that, despite efforts to streamline contract procedures, almost all ESCo funded projects are at a multi-million dollar scale – even though a significant amount of purchasing of energy-using equipment takes place on a much smaller scale.

While energy-saving capital projects deserve continued strong support, it is clear that the amount of activity required to raise the energy efficiency of the entire building stock cannot be accomplished through project-centered assistance alone.

Initiatives focused on changes in *process* are needed. Policies and programs that systematically affect building design and construction decisions, the easy availability of energy-efficient products, and purchasing behavior offer great impact for each public dollar spent. Two such broad-based strategies have already proven highly cost-effective: building code requirements for energy-efficient design features and efficient building equipment, and federal mandatory standards for appliance and equipment efficiency. A third approach, energy-efficient purchasing practices, has been largely overlooked despite its enormous potential.

3.1.1 The Case for Energy-Efficient Government Purchasing

A special emphasis on energy-efficient government purchasing is appealing for several reasons. Energy-efficient purchasing initiatives seek to re-direct existing spending rather than add new spending to the budget. Every year, agencies already budget and spend money to buy or replace appliances, equipment, interior furnishings, and other energy-

³ The material in this section is based in part on an internal LBNL memorandum prepared for the Mexico Energy Efficiency Agency (CONAE) with support from the US Agency for International Development (Harris et al. 2000).

related products; the objective is to convince purchasers to spend these funds differently – with attention to life-cycle cost rather than lowest first cost.

As discussed in the previous section, redirecting public buying power towards energy-efficient products can lead to substantial reductions in energy use, energy-related air pollution, and CO₂ emissions, as well as lower operating costs for government agencies themselves. Equally important, public sector leadership in energy-efficient purchasing, particularly if focused on a common set of technical criteria (such as the Energy Star label in the US), can be a powerful way to stimulate market transformation throughout the economy. Government purchasing can lead the market in two ways:

- by serving as a highly visible example for other buyers and
- by providing a clear demand-side market signal to manufacturers and suppliers, in order to stimulate the introduction of more efficient products at increasingly competitive prices.

3.1.2 Barriers to Energy-Efficient Purchasing

Public procurement can be complex, increasingly decentralized, and difficult for those outside the process to understand – let alone influence. Procurement officials work in an environment of conflicting policy objectives, extensive regulations, and a variety of pressures from both inside and outside government. They make a large number of decisions with limited time or information and must purchase a wide variety of products, frequently relying on past practices or “rules of thumb” to avoid unnecessary risk.

Achieving success in shifting government purchases toward energy-efficient products requires careful planning and attention to the many possible barriers, as well as a clear focus on the benefits of buying energy-efficient products. This section summarizes some of the barriers to energy-efficient purchasing. It then outlines some practical steps that can be taken by public officials and purchasing officers at all levels of government to implement effective policies and programs for energy-efficient purchasing.

For agencies seeking to implement energy-efficient purchasing, a primary barrier is the lack of data and technical specifications on energy-efficient products. Other obstacles include lack of staff time to research energy performance and concern about the cost of high-efficiency products. The key is to provide the right amount of information to the purchase decision-maker at the time it is needed, recognizing that many decisions are first made by facility managers or other end-users and then supported or rejected by procurement officials. Vendors are often the primary source for product information, despite strong buyer preferences for independent sources of information.

A second major barrier is "split incentives": the customer (either facility manager or end-user) is often different from the buyer, and neither one may pay the energy bill. This creates an environment where capital expenditures are frequently treated as if they were unrelated to operating expenses. Part of the solution may be to require that purchase

decisions be based on life-cycle cost rather than purchase price alone. While this may help to bridge the gap, a more effective way to address split incentives may be through changing budgeting practices. For example, special budget and bookkeeping rules may be needed to allow an agency to retain some of the savings in energy operating costs for future program costs or capital investments.

A third set of barriers to buying energy-efficient products involves competing policies or organizational needs, such as requiring domestic content of products, the use of preferred suppliers, and the streamlining and decentralization of many purchasing decisions. For new technologies, additional procurement barriers include risk aversion and requirements that any product bought by the government already be in widespread commercial use.

3.1.3 Key Implementation Strategies for Energy-Efficient Government Purchasing

The guidelines in the previous section are based in part on the experience with energy-efficient government purchasing in the US. This section presents basic strategies for energy-efficient government purchasing, and describes how they have been implemented in the US federal government.

The US DOE Federal Energy Management Program helps federal agencies implement energy-efficient purchasing through a program that also links to Energy Star Labels and to purchasing policies at the state and local levels. These programs use the buying power of the government to:

- reduce operating costs for federal agencies and save taxpayers' money;
- support and expand markets for today's best-practice energy-efficient and water conserving products;
- create new entry markets for advanced, energy-saving technologies and products;
- lower the costs of efficient products for all consumers by providing a large, reliable market;
- reduce federal energy use and greenhouse gas emissions; and
- provide a model for other levels of government, corporate, and institutional purchasers.

The following strategic objectives guide the federal program for procurement and use of energy-efficient products.

Make it Policy. The Energy Policy Act of 1992 and Executive Orders 13123 and 13221 provide the basic policy framework for energy-efficient purchasing throughout the federal government. To implement these statutory provisions and directives, a series of policy

letters and memoranda have been issued by the Office of Management and Budget, directing agencies to purchase "environmentally-sound and energy-efficient" products and services. Corresponding provision added to the Federal Acquisition Regulations, the one document most widely used by federal procurement officials, translate these broader directives into operational terms.

Each agency is directed to prepare an agency implementation plan for meeting the energy-efficient purchasing objectives (and other energy management requirements) of the 1999 Executive Order. The two federal supply agencies, the General Services Administration (GSA) and the Defense Logistics Agency (DLA), develop their own plans consistent with their special role as suppliers to other federal agencies. DOE's Procurement Policy office has also provided a model through the policy guidelines it issues for all DOE facilities.

Make it Easy. Facility managers and others responsible for purchasing decisions need to have easy access to accurate and complete information about product energy performance in order to consider energy efficiency in their decisions. Both FEMP and the Energy Star labeling program provide product-specific information on energy efficiency criteria and the brands and models of energy-efficient products which meet these requirements. FEMP issues *Product Efficiency Recommendations* for about 40 types of energy-using products widely purchased by federal agencies, and provides agencies with training and technical assistance on their use. GSA and DLA work with FEMP to identify Energy Star and other efficient products available from the federal supply system, including the new online shopping services. Additional outreach activities with commercial distributors serving the federal market helps identify Energy Star and other energy-efficient products provided from these commercial sources.

The FEMP *Product Efficiency Recommendations* are easy-to-use 1-2 page summaries that provide the user with clear energy efficiency criteria, a cost-effectiveness example, buyer tips, and additional sources of information, including links to on-line product listings. The material is distributed in written form (in a loose-leaf ring binder updated twice a year) and is also available electronically through the FEMP Web site at (<http://www.eren.doe.gov/femp/procurement>).

The *Efficiency Recommendations* focus on those product types that meet four key criteria:

- are widely purchased by federal agencies,
- use a significant amount of energy,
- offer a range of efficiencies (above the national mandatory standard), and
- have a generally accepted method of testing (and reporting) energy performance.

Where there are quantitative data on energy performance, DOE ranks the models available on the market and identifies an energy efficiency level for the upper 25%. Under some circumstances, this level may be adjusted to include additional models, which are slightly below the top 25th percentile of the market. For example, a lower criterion may be justified in order to include at least three competitive sources of supply (three

manufacturers). Other adjustments may be needed to conform to a natural break-point in the product distribution, to address significant gaps in product availability, or for consistency with other programs such as Energy Star, or rebates and other market transformation incentive programs offered by utilities. All FEMP-recommended criteria are subjected to a peer review process by federal agencies and other technical specialists prior to publication. The *Recommendations* are reviewed and, where necessary, updated about every 2 years in response to changes in the mix of energy-efficient products on the market, in national efficiency standards, or in the criteria for the Energy Star label.

In some cases, a product that saves energy may not be appropriate for a numerical rating of energy efficiency (examples include lighting controls or pumping systems). In such cases, FEMP may issue a “buyer’s advisory” to help buyers identify desirable product features, appropriate applications, and good installation practices.

Each agency determines how best to incorporate these Energy Star and FEMP criteria in its purchasing practices, including both facilities operations and new construction or renovation. It is up to the agency to determine if a product that meets the FEMP or Energy Star requirements is cost-effective for a specific application. Web-based software tools to estimate lifetime energy cost savings are available to help guide these application-specific decisions.

Make it Rewarding. Recognition is an important part of the Federal Procurement Challenge. A public ceremony in September 1995 launched the “Federal Procurement Challenge” by recognizing the leadership of the initial 21 participating federal agencies. This highly visible event, featuring the Vice President and senior administrators from each agency, signaled high-level commitment to the policy. On a continuing basis, FEMP also acknowledges outstanding individual or team contributions to energy-efficient procurement through the Federal Energy and Water Management Awards.

Make it Work. FEMP’s outreach efforts are an important way to both inform agency personnel and to obtain input from potential users on the development phase of new *Efficiency Recommendations* and other program elements. The FEMP Interagency Task Force and Product Procurement Working Group provide agency representatives with forums for exchanging ideas, and in turn provide useful feedback to FEMP program staff.

A second important element of program design is presenting a single, uniform signal to the market on energy efficiency for a given type of product. For example, if FEMP publishes a *Product Efficiency Recommendation* on a given product, the criteria selected are carefully coordinated with other labeling and utility incentive programs, consumer guides, commercial design specifications, voluntary industry initiatives, and other activities that may have an impact on the total market message. This requires careful coordination with other federal, non-profit, utility, industry, and state or local initiatives involving the same products.

For example, the National Institute for Building Sciences (NIBS) is leading a federal interagency effort to coordinate and simplify federal construction guide specifications, and to compile databases of construction-related products that conform to these requirements. Energy efficiency is an explicit criterion considered for all energy-related construction products and equipment, and the NIBS technical committees have agreed to require the same performance levels as Energy Star and FEMP. This in turn has laid the foundation for adopting many of the FEMP equipment efficiency recommendations into an update of the government-wide Uniform Guide Specifications, a process led by the three major military services as they update and harmonize their own previously separate specifications.

3.1.4 US Programs on Energy-Efficient Purchasing: Lessons Learned

After several years of FEMP program experience, the following points are among the most important to share with others:

(1) Policy statements vs rules and regulations? Both are needed.

- It is important to adopt a clear, explicit statement of government policy on buying energy-efficient products, and also to translate this overall policy into specific regulations and procedures that individual buyers can understand and use in their daily work.
- Overall policy statements can be made at government-wide or agency-wide level.
- Specific rules and regulations need to be clear and easy to follow.
- If possible, rules and procedures should try to make the efficient product – not the one with lowest first-cost – the simplest and most acceptable choice is to buy. For example, additional written documentation or a supervisor's signature should be required only for a purchase that not energy-efficient (e.g., because a product with the needed features is not offered, cannot be delivered quickly enough, or is demonstrated to be not cost-effective in a specific application).
- Changing government purchasing practices needs to be addressed from both a "bottom-up" and "top-down" perspective. Federal buyers are not likely to select efficient products in the absence of a clear policy, or if regulatory barriers stand in their way. But simply removing those barriers will not automatically change well-established practices. Both changes in policy and rules, and a change in attitudes and organizational practices need to happen in parallel.

(2) Merely adopting policies and rules is not enough; these have to be clearly communicated – not once but repeatedly – along with the tools and information that make it easy to comply.

- Top management must make a vigorous and continuing effort to communicate purchasing policies to managers and buyers throughout the agency, while emphasizing the benefits of energy-efficient purchasing and providing staff training.
- Information needs to be clear, compelling, and relevant to the decisions made by purchasers.
- Program designs should be based on a careful effort to understand the information channels purchasers actually use, and to deliver the message in those channels. For

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example, if purchasers rely on their suppliers to tell them about new products, then using a Web site as the main way to communicate about energy-efficient products may have little effect. Similarly, if there is a strong trend toward electronic purchasing (e-commerce), distributing written guides or brochures may not have much impact.

- Outreach efforts should include working groups that meet periodically to evaluate program progress and suggest further actions.
- Annual reviews of job performance by managers and staff involved with product purchasing should include compliance with energy-efficient purchasing as one specific measure of performance.
- A government-wide purchasing “scorecard” may be helpful in monitoring, evaluating, and comparing how well agencies are implementing the energy-efficient purchasing policies.
- After the purchase, make sure that users of the energy-efficient equipment understand how to properly install, operate, and maintain it so that the energy and cost savings are actually achieved and sustained. For example, a personal computer or monitor with low-power Asleep® mode will only work properly if the power management settings are correctly enabled, and consistent with network and software requirements.

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(3) Life-cycle cost analysis may work for large purchases, but most equipment is bought in much smaller quantities.

- Only for relatively large purchases might buyers be expected to spend the extra time to gather data on energy efficiency and purchase prices of alternative products, in order to compare the alternatives based on life-cycle cost.
- However, for smaller purchases this is not likely to happen – even assuming that the product data are available and the buyer knows how to calculate life-cycle cost (manually or using software)
- A simplified method is needed for the majority of small or medium-size purchase decisions, such as a recommended efficiency level, energy-efficient “quality mark” (like Energy Star), or an approved list of efficient products.
- An up-to-date list of qualified, efficient products (or suppliers who offer such products and agree to clearly identify them with a label or other means) can be a big help to buyers.

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(4) The more buyers who use the same efficiency levels, the better.

- Establish consistency across programs as a matter of government-wide policy; coordinate federal purchasing policies and the specific efficiency criteria with other levels of government – and with large corporate purchasers.
- Consider ways for the energy-efficient purchasing program to both build on and contribute to other programs such as testing, energy labels, efficiency standards, and utility or government incentives. For example:
 - Widespread energy labels make it much easier for government buyers to find and choose efficient products
 - Government purchasing creates demand for energy labels and labeled products, and thus encourages manufacturer and distributor interest in the labeling program

- Incentives can help a purchasing program get started (by making the efficient products less expensive, initially, to the buyer), but purchasing policies can also sustain a market for efficient products once incentives are no longer offered.

(5) Seek the active involvement of the private sector (manufacturers, distributors, contractors, ESCOs) in selling efficient products to the government.

- Encourage partnerships with private companies who see the government market as a way to increase their market share and/or profits from selling energy-efficient products.
- Also seek partnerships with non-governmental organizations and with programs supporting government purchasing of “green” (recycled, environmentally preferable) products.
- Use vendors to help spread the word to their clients, both public and private, about government purchasing policies and the benefits of buying efficient products.
- Incorporate these same equipment efficiency requirements in the specifications for energy efficient new construction and major renovation projects.

(6) Continue to update the program in response to changing technologies and market conditions.

- Success of a government purchasing program should help shift the overall market to higher levels of efficiency.
- Improved technologies and lower costs through competition can also make it easier to buy products at a given efficiency level.
- Changes in the level of government minimum efficiency standards can also require changes in government purchasing criteria (and energy labeling) criteria. As this occurs, consider raising the efficiency levels for government purchasing in order to maintain a market-leading role.
- To maintain program credibility and private sector support, make sure that all newly qualified energy-efficient models are promptly included in the data base of products.

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3.1.5 From Energy-Efficient Government Purchasing to Permanent Market Transformation

By itself, transforming federal government purchasing to emphasize energy-efficient products would represent a significant accomplishment, and would contribute to direct cost savings in federal facilities and operations. When closely coupled to an array of other market-oriented programs, however, energy-efficient purchasing can potentially set the stage for a much broader and more sustained market transformation.

One key point bears repeating: this coordinated approach to market transformation depends on establishing *common technical criteria for energy efficiency*, in order to provide a clear and uniform signal to the market. These criteria may cut across traditional program boundaries. An important part of the federal strategy is to enlist other levels of government, as well as non-governmental purchasers, to voluntarily adopt the same energy efficiency criteria for their own purchasing.

Government purchasing policies will have more impact if they are part of a visible, open process that encourages active participation by these other, non-federal purchasers. Maintaining good communication with government vendors and manufacturers is equally important, in order to better identify new opportunities, resolve any performance problems with newly introduced technology, and help assure that energy-efficient products will be available in adequate quantities to meet the demands of government buyers and others.

Market leverage increases in direct proportion to the stability and predictability of signals from major buyers -- not just the scale of their purchasing. The more reliable the demand for efficient products, the easier it is for manufacturers and distributors to prepare to meet this demand, and the more profitable it will be for the private sector to introduce or expand a line of more efficient products.

Finally, where an agency is also responsible for setting mandatory national energy efficiency standards for some types of equipment, the standard-setting activity needs to be in appropriate balance with procurement and other market-oriented programs. At best, the two can complement one another, with “market pull” programs establishing the commercial feasibility and market acceptance of higher efficiency products well before they might be considered for a mandatory standard.

To exploit the full potential of government purchasing as a market-shaping resource requires a fundamental redefinition of the mission of procurement – along with administrative rules, established practices, and the attitudes and actions of thousands of practitioners. Rather than a passive consumer who chooses among existing product offerings, government can take an active and explicit role in shaping the market: setting performance targets for more energy-efficient products and creating market incentives to reward those manufacturers and suppliers who act first to expand product offerings.

3.2 Public Internal Performance Contracting (PICO)

There is little or no documentation on projects in the US similar to the PICO concept being proposed in Europe (Kristof et al. 2001). As noted above, some state agencies and school districts in the US have made use of internal revolving funds to finance energy-saving projects, with budget and accounting procedures created so that the stream of energy cost savings are committed to repayment of the initial “loan” amount.

At the federal level, this has proven difficult, due to statutory restrictions against an agency committing funds that may be appropriated in future years. A special exception to this general restriction was made in the 1992 Energy Policy Act, to allow federal agencies to enter into energy savings performance contracts with ESCOs. One other recent exception involved non-appropriate funds received as revenue to the Bureau of Engraving and Printing, within the US Department of Treasury. These revenues, for services provided to other agencies, were not considered as funds appropriated to the Bureau by Congress, and so were not restricted in their use as a source for a US\$500,000 internal “loan” for use in a one-time energy retrofit project at one of the Bureau’s facilities.

4 References

- Alliance to Save Energy (ASE). 1998. "Leading By Example: Improving Energy Productivity in Federal Government Facilities." Washington, DC. November. <http://www.ase.org/profess/femp/>
- Casey-McCabe, N. 1995. *Federal Purchasing Volume*. Internal Memorandum,. Lawrence Berkeley National Laboratory, Washington, DC.
- Goldman, C.A., P. Juergens, M. Fowlie, J. Osborn, K. Kawamoto, T. Singer. 2000. "Historical performance of the US ESCO industry: Results from the NAESCO project database." *Proceedings of the ACEEE Summer Study on Energy Efficient Buildings*. Asilomar, CA. August.
- Goldman, C.A. 2002. Personal Communication. (based on forthcoming LBNL report, December 2002)
- Harris, J. and F. Johnson. 2000. "Potential Energy, Cost, and CO₂ Savings from Energy-Efficient Government Purchasing." *Proceedings of the ACEEE Summer Study on Energy Efficient Buildings*. Asilomar, CA. August. (LBNL Report 45439). <http://www.dc.lbl.gov/~harris/GovernmentPurchasing.pdf>
- Harris, J., P. Coleman, and S. Meyers. 2000. "Energy-Efficient Government Purchasing: Saving Energy, Money, and Avoiding Air Pollution." Internal staff memorandum to Mexico Energy Efficiency Agency (CONAE). December. Washington DC. (unpublished)
- Kristof, K., S. Ramesohl, and S. Thomas. 2001. "Public Internal Performance Contracting (PICO) and its Relation to Performance Contracting by an ESCo." Background paper for the EU PROST project. Wuppertal Institute. August. Wuppertal, Germany.
- Office of the President. 1999. "Greening the Government Through Efficient Energy Management." Executive Order 13123. Washington, DC. June 3. <http://www.eren.doe.gov/femp/resources/exec13123.html>
- Office of the President. 2001. "Energy-Efficient Standby Power Devices." Executive Order 13221. Washington, DC. July 31. <http://www.eren.doe.gov/femp/resources/exec13221.html>
- Pataki, George. 2001. "Green and Clean State Buildings and Vehicles." Executive Order 111. Albany, NY. June 10. http://www.gorr.state.ny.us/gorr/EO111_fulltext.htm
- US Department of Energy, Energy Information Administration (DOE/EIA). 2000. "A Look at Residential Energy Consumption in 1997." http://www.eia.doe.gov/emeu/recs/tables/housing_units_households.html
- US Department of Energy, Federal Energy Management Program (DOE/FEMP). 2001. "Annual Report to Congress on Federal Government Energy Management and

Conservation Programs, Fiscal Year 1999.” Washington, DC. May 10. DOE/EE-0252.
http://www.eren.doe.gov/femp/aboutfemp/ann99_report.html

US Environmental Protection Agency (US EPA), Climate Protection Partnerships Division. 2001. “The Power of Partnerships: Energy Star and Other Voluntary Programs.” 2001 Annual Report. Washington, DC. July. EPA 430-R-01-009.

White House. 2001. “Reliable, Affordable, and Environmentally Sound Energy for America’s Future.” Report of the National Energy Policy Development Group. Washington, DC. May 17. <http://www.whitehouse.gov/energy/>

Appendix A: Policy Documents on Energy-Efficient Purchasing

Contents:

Federal Executive Order 13123, Sec. 403 (excerpts)

Executive Order 13221 of July 31, 2001: Energy Efficient Standby Power Devices

**FAR CASE 2001-028, ENERGY EFFICIENT POWER STANDBY DEVICES and
FAR CASE 1999-011, ENERGY EFFICIENCY OF SUPPLIES AND SERVICES -
DRAFT FINAL RULE (excerpts)**

New York State's Energy Law, Article 5, Section 5-108-a (excerpts)

New York State Executive Order 111 (excerpts)

California Department of General Services - Management Memo

Purchasing Policy for City of Aurora, Colorado

Federal Executive Order 13123, Sec. 403 (excerpts)
(<http://www.eren.doe.gov/femp/resources/exec13123.html>)

(b) ENERGY STAR® and Other Energy Efficient Products.

(1) Agencies shall select, where life-cycle cost-effective, ENERGY STAR® and other energy efficient products when acquiring energy-using products. For product groups where ENERGY STAR® labels are not yet available, agencies shall select products that are in the upper 25 percent of energy efficiency as designated by FEMP. The Environmental Protection Agency (EPA) and DOE shall expedite the process of designating products as ENERGY STAR® and will merge their current efficiency rating procedures.

(2) GSA and the Defense Logistics Agency (DLA), with assistance from EPA and DOE, shall create clear catalogue listings that designate these products in both print and electronic formats. In addition, GSA and DLA shall undertake pilot projects from selected energy-using products to show a “second price tag,” which means an accounting of the operating and purchase costs of the item, in both printed and electronic catalogues and assess the impact of providing this information on Federal purchasing decisions.

(3) Agencies shall incorporate energy efficient criteria consistent with ENERGY STAR® and other FEMP-designated energy efficiency levels into all guide specifications and project specifications developed for new construction and renovation, as well as into product specification language developed for Basic Ordering Agreements, Blanket Purchasing Agreements, Government Wide Acquisition Contracts, and all other purchasing procedures.

(4) DOE and OMB shall also explore the creation of financing agreements with private sector suppliers to provide private funding to offset higher up-front costs of efficient products. Within 9 months of the date of this order, DOE shall report back to the President’s Management Council on the viability of such alternative financing options.

(c) ENERGY STAR® Buildings. Agencies shall strive to meet the ENERGY STAR® Building criteria for energy performance and indoor environmental quality in their eligible facilities to the maximum extent practicable by the end of 2002. Agencies may use Energy-Savings Performance Contracts, utility energy-efficiency service contracts, or other means to conduct evaluations and make improvements to buildings in order to meet the criteria. Buildings that rank in the top 25 percent in energy efficiency relative to comparable commercial and Federal buildings will receive the ENERGY STAR® building label. Agencies shall integrate this building rating tool into their general facility audits.

(d) Sustainable Building Design. DOD and GSA, in consultation with DOE and EPA, shall develop sustainable design principles. Agencies shall apply such principles to the siting, design, and construction of new facilities. Agencies shall optimize life-cycle costs, pollution, and other environmental and energy costs associated with the construction, life-cycle operation, and decommissioning of the facility. Agencies shall consider using Energy-Savings Performance Contracts or utility energy-efficiency service contracts to aid them in constructing sustainably designed buildings.

(e) Model Lease Provisions. Agencies entering into leases, including the renegotiation or extension of existing leases, shall incorporate lease provisions that encourage energy and water efficiency wherever life-cycle cost-effective. Build-to-suit lease solicitations shall contain criteria encouraging sustainable design and development, energy efficiency, and verification of building performance. Agencies shall include a preference for buildings

having the ENERGY STAR® building label in their selection criteria for acquiring leased buildings. In addition, all agencies shall encourage lessors to apply for the ENERGY STAR® building label and to explore and implement projects that would reduce costs to the Federal Government, including projects carried out through the lessors' Energy-Savings Performance Contracts or utility energy-efficiency service contracts.

Executive Order 13221 of July 31, 2001
Energy Efficient Standby Power Devices
(<http://www.eren.doe.gov/femp/resources/exec13221.html>)

By the authority vested in me as President by the Constitution and the laws of the United States of America, including the National Energy Conservation Policy Act (Public Law 95–619, 92 Stat. 3206, 42 U.S.C. 8252 *et seq.*), as amended by the Energy Policy Act of 1992 (EPACT) (Public Law 102–486, 106 Stat. 2776), and section 301 of title 3, United States Code, and in order to further encourage energy conservation by the Federal Government, it is hereby ordered as follows:

Section 1. *Energy Efficient Standby Power Devices.* Each agency, when it purchases commercially available, off-the-shelf products that use external standby power devices, or that contain an internal standby power function, shall purchase products that use no more than one watt in their standby power consuming mode. If such products are not available, agencies shall purchase products with the lowest standby power wattage while in their standby power consuming mode. Agencies shall adhere to these requirements, when life-cycle cost-effective and practicable and where the relevant product's utility and performance are not compromised as a result. By December 31, 2001, and on an annual basis thereafter, the Department of Energy, in consultation with the Department of Defense and the General Services Administration, shall compile a preliminary list of products to be subject to these requirements. The Department of Energy shall finalize the list and may remove products deemed inappropriate for listing.

Sec. 2. *Independent Agencies.* Independent agencies are encouraged to comply with the provisions of this order.

Sec. 3. *Definition.* “Agency” means an executive agency as defined in 5 U.S.C. 105. For the purpose of this order, military departments, as defined in 5 U.S.C. 102, are covered by the Department of Defense.

THE WHITE HOUSE,
July 31, 2001.

Excerpts from FAR CASE 2001-028
ENERGY EFFICIENT POWER STANDBY DEVICES
and
FAR CASE 1999-011
ENERGY EFFICIENCY OF SUPPLIES AND SERVICES
DRAFT FINAL RULE

PART 2--DEFINITIONS OF WORDS AND TERMS

Subpart 2.1--Definitions

2.101 Definitions.

"Energy efficient standby power devices" means products that use external standby power devices, or that contain an internal standby power function that use no more than one watt of electricity in their standby power consuming mode.

"Energy-efficient product" means a product that

- (1) Meets Department of Energy and Environmental Protection Agency criteria for use of the Energy Star trademark label; or
- (2) Is in the upper 25 percent of efficiency for all similar products as designated by the Department of Energy's Federal Energy Management Program.

"Energy-savings performance contract" means a contract that requires the contractor to:

- (1) Perform services for the design, acquisition, financing, installation, testing, operation, and where appropriate, maintenance and repair, of an identified energy conservation measure or series of measures at one or more locations;
- (2) Incur the costs of implementing the energy savings measures, including at least the cost (if any) incurred in making energy audits, acquiring and installing equipment, and training personnel in exchange for a predetermined share of the value of the energy savings directly resulting from implementation of such measures during the term of the contract; and
- (3) Guarantee future energy and cost savings to the Government.]

PART 11--DESCRIBING AGENCY NEEDS

11.002 Policy.

(d)(1) The Resource Conservation and Recovery Act of 1976 (42 U.S.C. 6901, et seq.), Executive Order 13101 of September 14, 1998, Greening the Government through Waste Prevention, Recycling, and Federal Acquisition, Executive Order 13123 of June 3, 1999, Greening the Government through Efficient Energy Management, and Executive Order 13221 of July 31, 2001, Energy Efficient Standby Devices, establish requirements for acquiring

- (i) Products containing recovered materials;
- (ii) Environmentally preferable products and services;
- (iii) Energy-efficient products and services;

- (iv) Products and services that utilize renewable energy technologies; and
- (v) Products containing energy efficient standby power devices.

(2) Executive agencies must consider use of recovered materials, energy- and water-efficient products and services, products containing energy efficient standby power devices, environmentally preferable purchasing criteria developed by the EPA, and environmental objectives (see Subparts 23.2, 23.4, and 23.703(b)) when

- i) Developing, reviewing, or revising Federal and military specifications, product descriptions (including commercial item descriptions) and standards;
- ii) Describing Government requirements for supplies and services; and
- iii) Developing source-selection factors.

Subpart 11.1 Selecting and Developing Requirements Documents

11.101 Order of precedence for requirements documents.

(b) Agencies must prepare ~~product descriptions~~ [requirements documents] to achieve maximum practicable[—

- (1) Energy efficiency, including using [products containing energy efficient standby power devices and]renewable energy technologies; and
- (2) Use of recovered material, other materials that are environmentally preferable, energy- and water-efficient products, and renewable energy technologies (see Subparts 23.2, 23.4, and 23.7).

PART 23--ENVIRONMENT, ENERGY AND WATER EFFICIENCY, RENEWABLE ENERGY TECHNOLOGIES, OCCUPATIONAL SAFETY, AND DRUG-FREE WORKPLACE

23.000 Scope.

This part prescribes acquisition policies and procedures supporting the Government's program for ensuring a drug-free workplace and for protecting and improving the quality of the environment by—

- (a) Controlling pollution;
- (b) Managing energy and water use in Government facilities efficiently;
- (c) Using renewable energy and renewable energy technologies;
- (d) Acquiring energy- and water-efficient products and services, environmentally preferable products, and products that use recovered materials; and
- (e) Requiring contractors to identify hazardous materials.

Subpart 23.2 Energy and Water Efficiency and Renewable Energy

23.200 Scope.

- (a) This subpart prescribes policies and procedures for
 - (1) Acquiring energy- and water-efficient products and services, and products that use renewable energy technology; and
 - (2) Using an energy-savings performance contract to obtain energy-efficient technologies at Government facilities without Government capital expense.
- (b) This subpart applies to acquisitions in the United States, its possessions and territories, Puerto Rico, and the Northern Mariana Islands. Agencies conducting acquisitions outside of these areas must use their best efforts to comply with this subpart.

23.201 Authorities.

- (a) Energy Policy and Conservation Act (42 U.S.C. 6361(a)(1)) and Resource Conservation and Recovery Act of 1976, (42 U.S.C. 6901, et seq.).
- (b) National Energy Conservation Policy Act (42 U.S.C. 8253, 8262g, and 8287).
- (c) Executive Order 11912, of April 13, 1976, Delegations of Authority under the Energy Policy and Conservation Act.
- (d) Executive Order 13123 of June 3, 1999, Greening the Government through Efficient Energy Management
- (e) Executive Order 13221 of July 31, 2001, Energy Efficient Power Standby Devices

23.202 Policy.

The Government's policy is to acquire supplies and services that promote energy and water efficiency, advance the use of renewable energy products, and help foster markets for emerging technologies. This policy extends to simplified acquisitions as well as larger dollar acquisitions.

23.203 Energy-efficient products.

- (a) If life-cycle cost-effective and commercially available
 - (1) When acquiring energy-using products, contracting officers must purchase ENERGY STAR[®] or other energy-efficient products designated by the Department of Energy's Federal Energy Management Program (FEMP);
 - (2) When acquiring energy using products that use standby power devices or functions, contracting officers must purchase products that use no more than one watt of electricity in their lowest power consuming mode, or if that is unavailable, purchase products with the lowest practical and available standby power wattage which have comparable performance and features; and
 - (3) When contracting for design, construction, renovation, or maintenance of a public building, or other services that will include energy-using products, the design specification must incorporate the requirements set forth in (a)(1) and (a)(2) of this paragraph.
- (b) Information is available via the Internet on—
 - (1) ENERGY STAR[®] at <http://www.energystar.gov/> ; and
 - (2) FEMP at <http://www.eren.doe.gov/femp/procurement> .

23.204 Energy-savings performance contracts.

- (a) Section 403 of Executive Order 13123 of June 3, 1999, Greening the Government through Efficient Energy Management, requires an agency to make maximum use of the authority provided in the National Energy Conservation Policy Act (42 U.S.C. 8287) to use an energy-savings performance contract (ESPC), when life-cycle cost-effective, to reduce energy use and cost in the agency's facilities and operations.
- (b)
 - (1) Under an ESPC, an agency can contract with an energy service company for a period not to exceed 25 years to improve energy efficiency in one or more agency facilities at no direct capital cost to the United States Treasury. The energy service company finances the capital costs of implementing energy conservation measures and receives, in return, a contractually determined share of the cost savings that result.
 - (2) Except as provided in 10 CFR Subpart 436.34, ESPCs are subject to Subpart 17.1 of the FAR.
- (c) To solicit and award an ESPC, the contracting officer—

- (1) Must use the procedures, selection method, and terms and conditions provided at 10 CFR Part 436, Subpart B (<http://www.wren.doe.gov/femp/resources/legislation.html>); and
- (2) May use the “Qualified List” of energy service companies established by the Department of Energy and other agencies.

Subpart 23.7—Contracting for Environmentally Preferable Products and Services

23.700 Scope.

This subpart prescribes policies for acquiring environmentally preferable products and services.

23.702 Authorities.

- (e) Executive Order 13101 of September 14, 1998, Greening the Government through Waste Prevention, Recycling, and Federal Acquisition.
- (f) Executive Order 13123 of June 3, 1999, Greening the Government through Efficient Energy Management.

23.703 Policy.

Agencies must—

- (a) Implement cost-effective contracting preference programs [promoting energy-efficiency, water conservation, and] favoring the acquisition of environmentally preferable products and services; and
- (b) Employ acquisition strategies that affirmatively implement the following environmental objectives:
 - (1) Maximize the utilization of environmentally preferable products and services (based on EPA-issued guidance).
 - (2) Promote energy-efficiency and water conservation.

PART 42—CONTRACT ADMINISTRATION AND AUDIT SERVICES

Subpart 42.3—Contract Administration Office Functions

42.302 Contract administration functions.

(a) ***

- (68) Monitor the contractor's environmental practices for adverse impact on contract performance or contract cost, and for compliance with environmental requirements specified in the contract. ACO responsibilities include—
 - (i) Requesting environmental technical assistance, if needed;
 - (ii) Monitoring contractor compliance with specifications requiring the use of environmentally preferable products, energy-efficient products, and materials or delivery of end products with specified recovered material content. This must occur as part of the quality assurance procedures set forth in Part 46; and
 - (ii) As required in the contract, ensuring that the contractor complies with the reporting requirements relating to recovered material content utilized in contract performance (see Subpart 23.4).

Excerpt from New York State's Energy Law
Article 5, Section 5-108-a

S 5-108-a. Energy efficient appliances.

1. The president of the New York state energy research and development authority, in consultation with the commissioner of the office of general services, shall promulgate minimum energy efficiency standards for appliances and energy using products purchased by or for the state or any agency thereof in accordance with the following schedule: by April first, two thousand two, fluorescent lamp ballasts, central air conditioners, room air conditioners, package terminal air conditioners and heat pumps; by October first, two thousand two, electric motors, refrigerators, freezers, refrigerator-freezers, water heaters, lamps and luminaries; and by April first, two thousand three, dishwashers, clothes washers, clothes dryers, furnaces, boilers and chillers. Additional minimum energy efficiency standards for appliances and energy using products may be added by the president of the New York state energy research and development authority, in consultation with the commissioner of the office of general services. Establishing minimum energy efficiency standards for appliances and energy using products shall be based on cost-effectiveness criteria and may be waived in the event that such appliances or products are not widely available, or for other reasons as determined by the president of the New York state energy research and development authority, in consultation with the commissioner of the office of general services. Such standards shall be designed to achieve cost effective savings to the maximum extent practicable, taking into account market availability.

2. New or replacement appliances or products purchased by or for the state or any agency thereof shall meet or exceed standards promulgated pursuant to this section, and all building designs or specifications for new construction or substantial renovation for any building owned or leased in whole by the state or any agency thereof shall incorporate appliances or products which meet or exceed such standards.

**New York State
Executive Order 111
(excerpts)**

**Directing State Agencies to Be More Energy Efficient and Environmentally Aware
"Green and Clean State Buildings and Vehicles"**

WHEREAS, New York is dedicated to the mutually compatible goals of environmental protection and economic growth;

WHEREAS, New York has adopted measures designed to allow energy markets to operate more competitively and has significantly reduced taxes in order to reduce energy costs and encourage continued economic growth;

WHEREAS, the generation and use of energy has a significant impact on the environment, contributing to emissions of sulfur dioxide, nitrogen oxides, greenhouse gases, and other pollutants;

WHEREAS, State government is a major consumer of energy, spending approximately \$300 million per year and purchasing approximately 1500 new vehicles annually with a concomitant impact on the environment; and

WHEREAS, it is appropriate that State government assume a leadership role in promoting the efficient use of energy and natural resources in the interest of the long-term protection and enhancement of our environment, our economy, and the health of our children and future generations of New Yorkers.

NOW, THEREFORE, I, GEORGE E. PATAKI, Governor of the State of New York, by virtue of the authority vested in me by the Constitution and Laws of the State of New York, do hereby order as follows:

I New Energy Efficiency Goals.

All agencies and departments over which the Governor has Executive authority, and all public benefit corporations and public authorities the heads of which are appointed by the Governor (hereinafter referred to as "State agencies and other affected entities"), shall seek to achieve a reduction in energy consumption by all buildings they own, lease or operate of 35 percent by 2010 relative to 1990 levels. All state agencies and other affected entities shall establish agency-wide reduction targets and associated schedules to reach this goal and shall also be responsible for establishing peak electric demand reduction targets for each state facility by 2005 and 2010. No buildings will be exempt from these goals except pursuant to criteria to be developed by the New York State Energy Research and Development Authority ("NYSERDA"), in consultation with the Division of the Budget ("DOB"), the Office of General Services ("OGS") and the Advisory Council on State Energy Efficiency ("Advisory Council") as established herein...

III Procurement of Energy-Efficient Products.

Effective immediately, State agencies and other affected entities shall select ENERGY STAR energy-efficient products when acquiring new energy-using products or replacing existing equipment. NYSERDA shall adopt guidelines designating target energy efficiency levels for those products for which ENERGY STAR labels are not yet available...

V Procurement of Clean Fuel Vehicles.

State agencies and other affected entities shall procure increasing percentages of alternative-fuel vehicles, including hybrid-electric vehicles, as part of their annual vehicle acquisition plans. By 2005, at least 50 percent of new light-duty vehicles acquired by each agency and affected entity shall be alternative-fueled vehicles, and by 2010, 100 percent of all new light-duty vehicles shall be alternative-fueled vehicles, with the exception of specialty, police or emergency vehicles as designated by DOB. State agencies and other affected entities that operate medium- and heavy-duty vehicles shall implement strategies to reduce petroleum consumption and emissions by using alternative fuels and improving vehicle fleet fuel efficiency...

VIII Participation of other governmental entities.

Local governments and school districts that are not subject to the requirements of this Executive Order are encouraged to review their energy efficiency practices and procedures, to institute appropriate operational and maintenance modifications, and to accelerate the implementation of energy efficiency projects. NYSERDA, OGS, the New York Power Authority and the Long Island Power Authority are hereby directed to offer any assistance as may be appropriate to assist local governments and school districts to achieve the goals of this Executive Order, including, but not limited to, assistance with procurement.

Signed: George E. Pataki

Dated: June 10, 2001

**California Department of General Services
Management Memo**

Subject: Procurement of Energy Efficient Products
ISSUED: 6/30/01
EXPIRES: until rescinded/superseded
REFERENCES: Public Contract Code Section 10307
Issuing Agency: Department of General Services

Background

California's current electrical energy crisis makes it imperative that state agencies purchase energy efficient products in order to conserve electrical power and natural gas, reduce peak power consumption, lower energy costs to state agencies, provide market leadership and support energy efficient purchasing by local jurisdictions, schools, and universities.

The DGS Directive on Purchasing Energy Efficient Products

The Federal Energy Management Program (FEMP) of the US Department of Energy (DOE) publishes product efficiency recommendations for many energy-consuming products. These recommendations are available on the web for viewing and downloading at: <http://www.eren.doe.gov/femp/procurement/begin.html>. Currently, the FEMP has recommendations for the following product categories:

Office Technologies: Computers, Monitors, Printers, Copiers, and Fax Machines.

Lighting Technologies: Fluorescent Tube Lamps, Fluorescent Ballasts, Industrial HID Luminaires, Downlight Luminaires, Fluorescent Luminaires, Compact Fluorescent Lamps, and Exit Signs.

Commercial/Industrial Equipment and Appliances: Air or Water-Cooled Electric Chillers, Air Conditioners, Heat Pumps, Boilers, Ice Cube Machines, Clothes Washers, Motors, Distribution Transformers, Centrifugal Pumping Systems.

Construction Products: Residential Windows, Roof Products.

Residential Equipment and Appliances: Room Air Conditioners, Dishwashers, Refrigerators, Clothes Washers, Central Air Conditioners, Gas Furnaces, Electric Water Heaters, Gas Water Heaters, Air Source Heat Pumps.

Water Saving Technologies (which save energy used to pump, heat and treat water): Faucets, Showerheads, Toilets, and Urinals.

Where FEMP-recommended standards are available, all state agencies shall purchase only those products that meet the recommended standards. All products displaying the Energy Star* label meet the FEMP standards. A purchase of an Energy Star*-labeled product automatically complies with this directive. The Energy Star* labeling program is a partnership between the US Environmental Protection Agency (EPA) and the US Department of Energy (DOE).

This directive applies to all purchases of energy consuming products, including those made using delegation authority, statewide contracts, multiple award schedules (CMAS), small business references, state price schedules, master agreements, Western States Contracting Alliance (WSCA) contracts and CAL-Card. For energy consuming products where there are no FEMP recommended standards, agencies shall purchase products that conserve electrical power and/or natural gas to the maximum extent possible.

Exceptions to this directive must be approved in writing by the Department of General Services Procurement Division's Sustainability Program Manager (see contact information below) prior to issuing a contract or purchase order.

The DGS Procurement Division's Sustainability Program Manager is Jim Byers. He is available to assist you with your energy consuming product purchases at (voice) 916-323-4250, (fax) 916-327-7195 or Jim.Byers@dgs.ca.gov.

BARRY D. KEENE, Director
Department of General Services

Purchasing Policy for City of Aurora, Colorado

"The City of Aurora shall incorporate energy efficient criteria consistent with ENERGY STAR and other FEMP-designated energy efficiency levels into all guide specifications and project specifications developed for new construction, as well as into product specification language developed for Basic Ordering Agreements, Blanket Purchasing Agreements, Government Wide Acquisition Contracts, and all other purchasing procedures."

(Source: Tim Cunningham, Environmental Planner, City of Aurora, CO. 303-739-7458)