Energy-Efficient Purchasing by State and Local Government: Triggering a Landslide down the Slippery Slope to Market Transformation†

Jeffrey Harris, Lawrence Berkeley National Laboratory
Matt Brown, New York State Energy R&D Authority
John Deakin
Steve Jurovics, The Cadmus Group, Inc.
Afroz Khan and Ed Wisniewski, Consortium for Energy Efficiency
James Mapp and Barbara Smith, Wisconsin Energy Bureau
Melissa Podeszwa, U.S. Department of Energy/Seattle
Alison Thomas, U.S. Department of Energy/Federal Energy Management Program

ABSTRACT

A growing number of jurisdictions are adopting energy-efficient purchasing policies, often based on ENERGY STAR7 labeled products and the U.S. Department of Energy Federal Energy Management Program (DOE/FEMP) criteria. Potential savings from energy-efficient purchasing are about $1 billion/year for all levels of government; state and local purchasing account for more than 75% of this total. Together, state and local agencies spend annually about $50-70 billion on energy-related products and $12 billion on energy bills. This scale of buying-power, if effectively harnessed, can help transform the market for energy-efficient products.

This paper reviews state and local purchasing programs around the country, explores the origins of these programs (including how they draw upon federal purchasing and ENERGY STAR), and discusses the strategic role of governmental and institutional buying in market transformation. Aggregating public sector demand sends a powerful market signal to manufacturers and vendors.

Introduction

A growing number of jurisdictions have followed the federal government's example in adopting policies for energy-efficient purchasing, often using the same criteria required for federal purchasing, i.e., ENERGY STAR labeled products or FEMP-designated products in the top-25th percentile of efficiency. In many cases, state and local "buy efficient" policies are part of a broader "buy green" policy for recycled and environmentally preferable products. An earlier study estimated that state and municipal governments together spend $12 billion/year on energy bills and another $50-70 billion/year on energy-related products (Dolin and Raynolds 1998). This level of buying power can accelerate market transformation toward energy-efficient products, especially if all government buyers pursue market aggregation by using the same efficiency criteria. Federal, state, and local government purchasing combined could save U.S. taxpayers about $1 billion per year in lower energy bills if all jurisdictions were to buy ENERGY STAR labeled or FEMP recommended products (Harris and Johnson 2000).[1]

[1] This earlier savings estimate might be higher now, with the addition of more categories of energy-using products covered by the ENERGY STAR label and FEMP recommendations (e.g., commercial food service equipment and products with low standby power).

Energy-efficient purchasing at the federal level began with the Energy Policy Act of 1992, calling for "guidelines to encourage acquisition and use by all federal agencies of energy-efficient products." Since then, three Executive Orders and changes in the Federal Acquisition Regulations have added specific purchasing requirements (http://www.eere.energy.gov/femp/technologies/eep_fed_policies.cfm). To help agencies implement these requirements, FEMP has issued nearly 45 energy-efficient product purchasing recommendations, ranging from large chillers and boilers to exit signs and fluorescent ballasts (http://www.eere.energy.gov/femp/technologies/eeproducts.cfm). For products covered by ENERGY STAR labels, FEMP purchasing criteria match the ENERGY STAR requirements (http://www.energystar.gov/).

Early experimentation by states and local governments with energy-efficient purchasing began in the late 1970s, with provisions in the Energy Policy and Conservation Act requiring states to consider life-cycle costs in purchase decisions. Around the same time, the City of Seattle undertook a pilot project on energy-efficient purchasing, funded by DOE's Urban Consortium program (Scharer and Pratt 1990). However, none of these early efforts made a permanent impact on state and local government procurement practices. In the early 1990s state purchasing officials and energy experts from New York, Ohio, and Wisconsin, with funding from DOE and the Environmental Protection Agency (EPA), formed the non-profit Energy-Efficient Procurement Collaborative. One of the organization's first actions was to compile a "Data Sources Directory" for buyers, buyers, including energy-efficient lighting, office equipment, appliances, electric motors, and space conditioning equipment. However, Collaborative participants soon recognized that information alone would not transform purchasing practices, and that the cost of updating and distributing printed lists of efficient products would soon become prohibitive.

At this same time, the ENERGY STAR labeling program was gaining significant momentum in terms of public recognition and the range of products covered. EPA developed an ENERGY STAR Tool Kit to help state and local purchasing agents identify and choose ENERGY STAR products (www.energystar.gov/purchasing). The Tool Kit contains product information, savings calculators, product lists, and sample procurement language. The Procurement Collaborative also developed a Communications Kit to help buyers justify the selection of energy-efficient products. The Procurement Collaborative disbanded in the mid-1990s and transferred its functions and EPA support to the non-profit Consortium for Energy Efficiency (CEE). CEE continued to promote energy-efficient state and local purchasing through:

- outreach to the National Association of State Purchasing Organizations (NASPO), National Institute of Governmental Purchasing (NIGP) and others;
- case studies to highlight purchasing practices, issues, and successes; and
- a market segmentation report, guidebooks, and a model program plan on energy-efficient purchasing (http://www.cee1.org/gov/purch/purch-main.php3).

Examples of Energy-Efficient State and Local Purchasing

To better understand the recent surge of interest in energy-efficient purchasing by states and municipalities we contacted more than 40 agencies by phone and email, supplemented by Web searches. Table 1 summarizes the results. While not an exhaustive list, these programs represent the wide range of energy-efficient purchasing policies and programs now in place.

State governments active in energy-efficient purchasing represent more than one-third of state government buying power (based on number of employees).

Many of these programs began with enactment of a state law or local ordinance, issuance of a Governor's Executive Order, or adoption of a policy statement by the City Council or Mayor. But in some cases the initiative came from below, through persistent efforts by a few key staff or a forward-looking program manager. We also found cases where progressive purchasing policies had been adopted but seemingly were not being implemented in practice.

Case Study 1: Wisconsin State and Local Agencies

Program origins. In Wisconsin, the Department of Administration (DOA) includes three agencies with important roles in specifying and buying energy-efficient equipment: the Division of Energy, the purchasing authority, and the office that builds and operates state buildings. The office responsible for statewide housing programs was also part of DOA until recently. This structure made it easier for the Division of Energy to work closely with these other offices to incorporate ENERGY STAR and other energy-efficient criteria into design guidelines, equipment specifications, and building commissioning.

A centralized purchasing authority for the State of Wisconsin helps lower costs through large-volume purchases. Cooperative purchasing provisions make these same benefits available to counties, cities, school districts, and utility districts. An Internet site (http://vendornet.state.wi.us/vendornet/default.asp) gives all these jurisdictions, as well as vendors, easy access to new bids, current contracts, etc. Division of Energy staff monitor this web site and follow up with purchasing agents on bid requests where there is a potential to incorporate ENERGY STAR requirements. Even if it is sometimes too late to change the current bid request, this is a way to educate specifiers, and purchasers and alert them to new energy-efficient specifications.

Wisconsin adopted its first energy-efficient purchasing requirements for motors, compact fluorescent lamps (CFLs), and light-emitting diode (LED) exit signs in the early 1990s, even before the ENERGY STAR labeling program had expanded beyond office equipment. Even without an explicit state policy directive the program has persisted and expanded to specifications for many types of building equipment, appliances, lighting, and traffic signals. After initially focusing on statewide purchasing through DOA, the Division of Energy began to reach out to the University of Wisconsin, the Housing and Economic Development Authority (WHEDA) and the Department of Transportation (DOT), to help these organizations incorporate energy efficiency in ongoing programs.

State purchasing contracts. Examples of successes in incorporating ENERGY STAR and other energy-saving guidelines into Wisconsin state purchasing contracts include:

- *Office equipment* - Wisconsin has been very successful in specifying ENERGY STAR office. The initial contract "preference" for ENERGY STAR was later changed to a requirement once the purchasing agent determined this was feasible, based on product availability and cost. The same state contracts are widely used by local governments.
- *Lighting* – Wisconsin has negotiated statewide contract prices for electronic ballasts, low-mercury T-8 fluorescent tubes, and ENERGY STAR CFLs.

Table 1. Energy-Efficient Purchasing by States and Local Governments

Program	Products Included							Efficiency Criteria				Legal Authority				Program Origin					Notable Features
	Appliances	HVAC	Lighting	Office Equipment	Traffic Signals	Vehicles	Other	Energy Star	FEMP	State Specific	Other - CEE/NEMA	Executive Order	State Legislature	Policy Memo	Admin. Regulation	Environment	Sustainability	Regional Issues	Cost Savings	Other	
States[1]																					
Arizona	x	x	x	x	x	x	x	x					x			x		x	x		Exempts purchases over $35k if buyer shows that an Energy Star/FEMP product is not cost-effective.
California	x		x	x		x	x	x	x			x	x	x	x	x			x		Efficient equipment for new state buildings; contractor guides for state/local agencies; developing specs for low-rolling resistance tires (with OR and WA).
Hawaii	x	x	x	x	x	x	x	x	x				x					x			
Indiana				x		x	x	x			x	x				x				x	Duplex (2-sided) printing required for copiers and printers.
Maryland				x			x	x	x			x				x	x				Initial activity in response to 2001 Exec. Order; recent program constraints due to state budget.
Massachusetts			x	x				x				x				x					Report on FY01 purchases & savings for energy-efficient & environmentally preferable products.
Minnesota				x		x	x	x	x			x				x					State contracts identify effic. products; coding system allows tracking; separate specs for high-mpg vehicles.
Nevada	x	x	x	x	x	x	x	x	x				x					x	x		State Energy Cons. Plan calls for Energy Star equipment & efficient motors; compliance unclear.
New Mexico							x				x	x								x	Exec. Order for EE purchasing based on LCC
New York State	x	x	x	x		x	x			x		x	x			x	x	x	x		Extensive purchasing program based on law & Exec. Order; requirement average state fleet vehicle effic. above CAFE.

Table 1. Energy-Efficient Purchasing by States and Local Governments (Continued)

Program	Products Included							Efficiency Criteria				Legal Authority				Program Origin					Notable Features
	Appliances	HVAC	Lighting	Office Equipment	Traffic Signals	Vehicles	Other	Energy Star	FEMP	State Specific	Other - CEE/NEMA	Executive Order	State Legislature	Policy Memo	Admin. Regulation	Environment	Sustainability	Regional Issues	Cost Savings	Other	
States (continued)																					
North Carolina				x		x		x		x		x				x					
Utah			x	x	x					x					x			x			EPA supporting new project to identify E* products on state contracts
Vermont		x	x	x		x	x	x	x			x				x					Energy-efficient purchasing preceded 1994 Exec. Order.
Virginia				x			x	x			x				x				x		Life-cycle cost-based solicitation for ice-makers - adopted by other states
Wisconsin	x	x	x	x	x			x	x		x									x	Very active program for energy-efficient purchasing; same criteria built into state construction master specs.
Cities																					
Arlington Co VA		x		x		x		x								x	x				Staff leadership and policy encouragement from Board of Supervisors.
Montgomery Co. MD	x	x	x	x	x			x							x	x					Sustained staff leadership from Dept. of Facilities and Services.
New York City NY		x	x	x				x							x				x		Buy Energy Star products if available from 6+ manufacturers
Portland OR	x	x	x	x		x	x	x							x	x	x				Support by city officials: 1979 energy policy; 1994 Sustain. principles; 2002 Sustain. Purchasing
Santa Monica CA				x	x	x		x								x					Longstanding support by city officials
Washington DC	x	x	x	x	x	x	x	x	x							x			x		Coding products in new e-procurement system, to help buyers & track purchases. Agreement to allow added first-cost for efficient products.
Universities																					
Univ. of CA							x	x								x	x				Contacting manufacturers & other universities to increase availabiliy of more effic. lab equipment

1. Purchasing departments in several states are reducing state expenses through some degree of ENERGY STAR purchasing, including Colorado, Connecticut, Maine, Minnesota, Missouri, Montana, Ohio, and Virginia. Typically, when product contracts expire, ENERGY STAR specifications are included in new requests for pricing.

- *Appliances in University housing* - Energy Division staff worked closely with purchasers from the University of Wisconsin (UW) Housing Office to include appliance efficiency specifications in the contract rebid cycle. UW added an ENERGY STAR requirement for clothes washers (residential and commercial coin-op), and plans to use the same approach for other contract rebids. Energy Division staff provided information on ENERGY STAR refrigerators purchased by other large buyers at prices lower than the current UW contract price – making it all the more likely that UW will specify ENERGY STAR refrigerators in the next contract rebid.
- *Room air conditioners* (ACs) posed a special challenge. Although the largest UW campus buys 300-500 AC units/year, the University initially resisted specifying ENERGY STAR, believing that only one model met their unique requirements. Room ACs are installed in UW dorms only for the summer term, so the University had developed a system of custom metal window brackets to allow the unit to be inserted from inside while minimizing the risk that it would fall. This in turn led to specific "footprint" and weight requirements for room ACs. Energy Division staff were able to identify ENERGY STAR-qualifying models that met these same specifications, allowing UW to specify ENERGY STAR in its latest room AC bid.
- *Traffic signals* - For years, the Energy Division staff had discussed LED traffic signals with engineers and purchasing agents from the Department of Transportation (DOT). In 2002, DOT was able to allocate enough money for traffic signal changeout to consider a mass-replacement of LED signals. DOT's decision to purchase LEDs, using ENERGY STAR specifications, was based on the experience of other states and cities as well as technical advice from the Division of Energy. As a further public safety benefit, the low-power LEDs made it possible to install battery backup systems to operate signals during electricity outages. In many smaller communities, the State is also responsible for traffic signals on state highways in the town. The State's use of LED signals thus helped local governments become familiar with the technology, which they were then able to purchase under State contract or from local suppliers.
- *LED retail signs* - The Department of Revenue buys lighted signs for state lottery ticket retail outlets. While the Division of Energy urged the Department of Revenue to consider LEDs based on energy savings, the Department itself preferred the LEDs because they were brighter than fluorescent or neon signs. Realizing they could buy LED signs for no added cost, they required LEDs in the next bid solicitation.
- *Pre-rinse spray nozzles* - Wisconsin's Focus on Energy program provides free installation of energy-efficient pre-rinse dish sprayers in restaurants, institutions, and multi-family housing facilities.[2] Data on the first 100 installations show average savings for each sprayer replaced of 400 therms/year, with paybacks of a few months.

[2] This product is covered by a recent FEMP purchase recommendation and is being considered for an ENERGY STAR label.

Program leverage. In addition to direct purchase of ENERGY STAR and other efficient products, state agencies affect many other indirect purchases. Wisconsin's master design specifications (http://www.doa.state.wi.us/dsf/mastspec.asp) require ENERGY STAR equipment for new state buildings and major retrofits. In deciding which housing projects will qualify for a limited pool of tax credits, WHEDA gives preference points to projects with ENERGY STAR equipment. The Division of Housing mandates that its grant recipients choose ENERGY STAR appliances, systems, and components.

Similarly, the state low-income weatherization program requires all local weatherization agencies to specify ENERGY STAR equipment unless they show that it is not feasible to do so. This covers furnaces (some with high-efficiency fan motors), boilers, refrigerators, freezers, CFLs, replacement windows, room and central AC, and even items such as ENERGY STAR dehumidifiers and ventilation fans. Wisconsin's weatherization program was one of the first states to require condensing furnaces, which stimulated the regional market for condensing furnaces (Schlegel and Prahl 1994). This program requirement helped contractors become familiar with this new technology and helped bring prices down though volume purchasing and competition among suppliers.

Remaining challenges. Understanding how equipment is purchased during a major retrofit is a challenge, since there is a tendency with large projects to lose control over specific components. Contractors often purchase equipment on their own, outside of state contracts. One solution may be for state agency staff to intensively follow one project, advocating bid language that requires ENERGY STAR equipment, and then follow up to make sure this happens. Setting a precedent in this way may make it more likely that future contracts will build in ENERGY STAR and other efficiency specifications.

ENERGY STAR opportunities are sometimes buried in unlikely RFPs. Recently, UW issued a bid request for "student dorm furniture," but one of the "furniture" items was a combined mini-fridge and microwave. By contacting manufacturers, Energy Division staff identified models where the refrigerator unit qualified as ENERGY STAR– even though the model number of this "combined" product was not listed on the ENERGY STAR web site. UW amended its bid request to require ENERGY STAR for the refrigerator part, and also in a subsequent request for stand-alone mini-fridges.

Leasing of both equipment and office space is another area for further work. Equipment such as copy machines, vending machines, and glass-front beverage coolers are typically leased from a distributor, while the energy bill is paid by the state agency. Requiring ENERGY STAR equipment in future lease agreements and retrofits of existing leased space are important areas of opportunity.

Lessons learned. The Division of Energy has learned the value of identifying purchasing agents and other individuals willing to be energy efficiency champions. It is helpful to keep track of contract-rebid schedules and provide information to specifiers and purchasing agents well in advance. Persistence is important; seeming technical barriers – such as product footprint (room AC), uncertain lifetime (LED traffic signal), or loyalty to an older model due to spare parts on hand (hot food holding cabinets) – can mysteriously fade in importance as the ENERGY STAR alternative becomes firmly established in the market. Thus, it is important to regularly revisit past issues.

Case Study 2: New York State and NY City

Program origins. New York State's energy-efficient purchasing initiative is guided by both administrative policy and legislation. Section 5-108-A of the New York State Energy Law (9/2000), directs the New York State Energy Research and Development Authority (NYSERDA) to establish minimum efficiency standards for state purchasing. The following year, Governor Pataki issued Executive Order No. 111, "Green and Clean State Buildings and Vehicles" (6/01; http://www.nyserda.org/exorder111guidelines.pdf) as part of an integrated statewide energy plan and policy. This Order, affecting 400 million sq.ft. of public buildings, also mandates energy-efficient purchasing:

> "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 ENERGYSTAR® labels are not yet available."

State agencies are also directed to work with local governments and schools to voluntarily adopt energy efficiency standards. Underlying policy objectives include:

- reducing state government operating costs
- improving facility operations, management practices, and reliability
- increasing knowledge and use of high-efficiency products, green construction practices, and renewable energy
- reducing summer peak demand with the state's newly deregulated utility market
- strengthening the state economy by reducing the long-term tax burden and lowering economic dependence on oil and other imported fuels

Progress to date. The New York State Office of General Services (OGS) is the state's primary procurement arm. OGS has been integrating energy-efficiency into its procurement policy for many years. The Dormitory Authority of the State of New York (DASNY), which provides construction management, procurement and financing, is also a leader in energy-efficiency procurement in the state. Local governments and eligible not-for-profits can also access state procurement contracts.

The legislation specified a schedule for issuing efficiency requirements for state purchasing, but this has taken longer than expected due in part to state requirements that allow ample time for stakeholders to comment. Criteria for energy-efficient residential and commercial ACs, room ACs, and fluorescent ballasts were published in May 2003 (http://enviro2.blr.com/display_reg.cfm/id/36689). Meanwhile, Executive Order No. 111 specifies the use of ENERGY STAR and FEMP criteria, supplemented by life-cycle costing. Outreach efforts continue to raise awareness of energy-efficient products among purchasing and business officials, as well as physical plant administrators and agency senior management. A separate NYSERDA initiative for energy-efficient purchasing by local governments and universities (New York Energy Smart Offices) publishes fact sheets on ENERGY STAR office equipment, targeted to policymakers, information technology staff, procurement officials, and vendors. These fact sheets also emphasize the need to "enable" the low-power settings required by ENERGY STAR.

Challenges and lessons learned. As with any new initiative, it is important to include education and marketing. Identifying key organizations and individuals and gaining their trust are essential to legitimizing the requirements. After attending training or presentations at professional development conferences, many purchasing officials and business officials were very excited about their new ability to apply energy efficiency standards and the benefits to their agencies from buying ENERGY STAR equipment. For several reasons, progress is difficult to quantify: there is no single state agency responsible for purchasing, procurement reporting requirements do not include details on quantity and type of equipment, and both state and local agencies have options other than OGS or DASNY contracts (as long as they follow competitive procedures).

New York State benefited from the early efforts of agencies like OGS and DASNY, as well as other well-established energy efficiency programs. Action by the state legislature, combined with the Executive Order, added legitimacy to longstanding efforts at the staff level regarding energy efficiency. Adopting efficiency standards already set by ENERGY STAR, the Consortium for Energy Efficiency (CEE), FEMP, NEMA, and other regional and national programs has streamlined the process, and builds on easily recognizable efficiency criteria. In combination with efforts in neighboring states, it has helped build a demand for energy-efficient products at competitive prices.

Local governments in NY State. Following the path set by statewide policy, in April 2003 New York City enacted legislation to codify and extend its earlier (ca. 1994) energy-efficient purchasing practices. Mayor Bloomberg signed Local Law No. 30, requiring energy-using products purchased by the City of New York be ENERGY STAR labeled, provided that there are at least six manufacturers offering such products. Even prior to this local statute, the city spent $90.8 million for ENERGY STAR labeled products in FY 2002. An additional amount, not easily quantified, was spent on energy-efficient equipment installed as part of construction or renovation projects.

Other State and Local Programs

Arizona. Arizona Governor Janet Napolitano signed a law in April 2003 setting goals for reducing energy use in state government and university buildings, similar to the Federal building goals in the 1992 Energy Policy Act and subsequent Executive Orders. The Arizona law mandates that:

> "All state agencies shall procure energy-efficient products that are ... ENERGY STAR [labeled] or that are certified under the Federal Energy Management Program...unless the products are shown not to be cost-effective on a life-cycle cost basis." (Arizona Statutes, HB 2324)

Taken together, these initiatives are estimated to save Arizona taxpayers about $90 million in the next 12 years, according to the Southwest Energy Efficiency Project (SWEEP 2003). The program, still in its early stages, is actively supported by top

management in the State Procurement Office, which provides outreach and training for other state agencies. Rules implementing the new legislation provide that:

- procurements under $35,000 meet the applicable ENERGY STAR label requirements
- procurements over $35,000 meet ENERGY STAR requirements, or the agency must show that a non-ENERGY STAR product is more cost-effective on a life-cycle basis
- where existing contracts include both ENERGY STAR and other products, only the ENERGY STAR products shall be purchased, and contracts without ENERGY STAR products may not be extended.

California. The California Department of General Services issued a Management Memo on ÂProcurement of Energy-Efficient Products@ (Memo #01-14, 7/20/01) directing that:

> "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."

DGS guidelines for major capital construction projects also require that equipment, appliances, and roofing systems purchased as part of new construction or renovation are ENERGY STAR compliant. According to Dan Burgoyne, Sustainability Manager at the CA Dept. of General Services.

> "California state government invests over $3.8 billion annually in design and construction. California already has some of the most stringent energy codes in the country (Title 24); using ENERGY STAR products has helped state projects meet and sometimes exceed these stringent energy codes by up to 30 percent."

As part of the "West Coast Global Warming Initiative" the States of California, Oregon, and Washington are planning an initiative to introduce more efficient (lower rolling resistance) tires to their own vehicle fleets and eventually to the larger market. These tires, often furnished as original-equipment with a new car, are difficult to find in the replacement market. A public domain database on low-rolling-resistance tires could be initiated through California's tire testing program, and eventually expanded and updated if these states were to require future bids on tire contracts to submit rolling-resistance test data that could later used by public agencies and consumers (Grandy 2004; Koyama 2004; http://www.climateregistry.org/docs/PRESS/Tri-State092203.pdf).

King County WA. King County has purchased 32 hybrid electric vehicles for the county government fleet under a master contract issued by the State of Washington. The purchase price for these hybrids, with twice the fuel economy of the average new car, was about the same as what they paid for conventional sedans. Based on this experience, King County is leading a cooperative national procurement ("US Communities") to

develop a common specification for many jurisdictions to use in bulk-purchase of high-mileage hybrids for their fleets (http://www.newdream.org/procure/hevproj.html). Participating states and cities may also seek a change in federal rules that now require government agencies to purchase alternative-fuel vehicles; the change would allow hybrids and other high-mpg vehicles to count as "AFV-equivalents" based on their savings of petroleum fuels (Grandy 2004).

University of California. The statewide UC system currently specifies ENERGY STAR office equipment, and is looking at ways to extend energy-efficient purchasing into one of the fastest-growing procurement areas: energy-using equipment for the University's many laboratory facilities. Energy use by lab equipment, an important issue for many other universities, private firms, and Federal agencies, was discussed at a special panel session at the Labs-21 Conference (Denver, 10/03). Planned follow-ups include contacts with major manufacturers of lab equipment, inviting them to work with their large university customers and others to develop more efficient products.

Discussion

Obstacles and Solutions

Despite the large savings potential for energy-efficient government purchasing, there are a number of obstacles to success. Some have to do with the core goals of public purchasing: to promote transparency (reduce corruption), lower the costs of routine purchasing, and simplify the process where possible. These goals may make purchasing departments risk-adverse and resistant to changes in practices that seem to work well.

Although many efficient products are available at prices equivalent to less efficient models, some do have higher first-cost. One of the most intractable obstacles to energy-efficient purchasing is the tradition of obtaining multiple bids and then selecting the one with lowest purchase price. While this leads to products or services with low first-cost, in the case of energy-using equipment this can also mean lower efficiency, making the equipment more expensive to own and operate. The obvious solution is to base purchase decisions on total life-cycle costs (LCC).

Unfortunately, it is often difficult or costly to evaluate LCC at the time of purchase. A number of tools have been created to help buyers compare total owning and operating costs, but these are often seen as too complex or too data-intensive to be useful. Sometimes training in use of the tools can help, along with easier access to data on purchase prices and energy costs – but many purchasing officials are more receptive to lists of pre-approved items, with life-cycle cost used to justify exceptions, or for very large contracts. Other barriers to energy-efficient purchasing may include:

- divided purchasing responsibility - Higher value items may be purchased centrally with lower cost ones decentralized to operating units or to individuals. Decentralized purchasing makes it harder to reach and influence buyers with new policy directives.
- limited staff resources and excessive paperwork - Government purchasers frequently see themselves as facing too many decisions in too little time. This

makes it hard to introduce new purchasing requirements or to get them to participate in training

- lack of technical knowledge – Some buyers view energy-efficient purchasing as requiring technical skills or information they lack; others assume that it is up to the final user to specify the desired efficiency level. Users often see their own influence as limited, believing that the purchasing office sets specifications. This role uncertainty may be more common where local officials do not set a clear policy or recognize that energy efficiency lowers operating costs.

Key components of a successful energy-efficient purchasing program are:

- a statute, ordinance, or policy statement requiring energy-efficient purchasing,
- staff involvement in program development, to ensure purchasing staff buy-in,
- the availability of easy-to-use tools and information resources,
- initial and periodic re-training on purchasing requirements and tools, and finally
- ongoing political commitment and periodic progress reviews by decision makers.

The programs we reviewed also show the importance of at least one "program champion," who may be a manager, technical staff, or an elected official. The availability of ENERGY STAR labels has been another important factor in the success of many state and local purchasing programs. ENERGY STAR provides a clear, widely recognized set of criteria for government buyers to communicate to their suppliers. Widespread use of the label makes it easy for individual retail buyers to identify energy-efficient products. Finally, a labeling program like ENERGY STAR can reduce the workload of purchasing agents by providing some assurance of product reliability and competitive sources as well as efficiency, offering a convenient Web-based list of brands/models and suppliers.

It is important to realize that even the most comprehensive and effective procurement policy will not exhaust the prospects for efficient energy management. These include appropriate equipment sizing of space conditioning systems, quality installation, controls, commissioning, lighting system design, and other whole-building and system issues. Government purchasing programs are often most successful where they are part of a wider effort to improve energy efficiency and reduce operating costs. Viewed solely as an energy issue, purchasing is less likely to be taken seriously than if it is seen as part of a wider commitment to "good government" and fiscal management.

Estimating and Tracking Program Savings

A continuing challenge to government energy-efficient purchasing programs is the expense and difficulty of collecting data on actual purchases, especially where purchase decision-making is highly decentralized. A notable exception is a Massachusetts report quantifying the benefits of energy-efficient and environmental purchasing (Mass. OSD 2003). The key was a state requirement that vendors submit detailed sales data under the terms of their state contracts. These data, combined with estimated per unit energy savings (from the ENERGY STAR website), were used to calculate energy, dollar, and environmental benefits from state government purchasing. In FY 2001, total purchases of environmentally preferable products (EPP) were $92.5 million. About 75% of this total

was recycled-content products; the remaining 25% was ENERGY STAR computers and office equipment, alternative-fuel vehicles, and less-toxic cleaning products. Estimated annual cost savings, just from energy-efficient office equipment, was $269,000/year, for the 11,000 PCs, 7600 monitors, 1200+ copiers, and 120 fax machines purchased in FY01.[3] Energy cost savings from office equipment represented more than half of the Commonwealth's total savings from all EPP products, and substantially more (after just one year) than the total cost of the entire EPP program. Future savings should amount to about $1.3 million over the typical 5-year lifetime for office equipment.

Conclusions and Policy Recommendations

How Purchasing Programs Get Started

There is no single path to success for energy-efficient government purchasing programs. The starting point can be either a new law or regulation, or simply a decision by someone in the purchasing chain to make innovative use of existing rules. Some jurisdictions with clear mandates in place have done little thus far to actually buy efficient products; others (Wisconsin, Montgomery Co. MD) have acted aggressively and with considerable success for many years, even without an explicit policy mandate. In every case, though, leadership has played a key role, whether the "program champion" is an elected official or a member of the purchasing office staff. Equally valuable is sustained political and administrative support, as in Santa Monica and several other jurisdictions (See Table 1).

Energy-efficient purchasing may be most readily embraced by elected officials when it is closely linked with other policy objectives: Environmentally Preferable Purchasing (EPP), sustainability in government, energy conservation in general, pollution prevention, climate change mitigation, and government cost savings. Environmentally Preferable Purchasing (especially of recycled products) is perhaps the most common starting point for energy-efficient purchasing. Yet, in many cases, the scope of EPP programs fails to move beyond recycled products and other environmental attributes to include energy-efficient purchasing. Even environmentalists, it seems, sometimes have difficulty in linking energy efficiency to pollution prevention or climate change.

ENERGY STAR office equipment is still a common starting point for energy-efficient government purchasing, and sometimes remains the sole focus. In a few cases, interest or success with a single new technology (such as LED traffic signals) can lead to a broader program. In some cases, rules or preferences for lowest first-cost may not be a major barrier, as long as purchase decisions can be based on "best-value." In Wisconsin, for example, many purchasing officials believe that state purchasing power has helped reduce the costs of efficiency.

On the other hand, simply directing government purchasing staff to "use life-cycle cost" (LCC) in purchase decisions is not likely to succeed given the effort required to gather the information. One interesting exception is the State of Virginia, which used an LCC formula (purchase price + electricity + water costs) rather than an efficiency specification, to solicit bids for icemakers. Arizona allows agencies to use LCC analysis where to claim an exemption from the general requirement to buy efficient products.

---

[3] Assuming a 75% enabling rate for power management features.

Untapped Potential

Our program inventory showed growing interest in energy-efficient state and local purchasing, but many other jurisdictions have yet to seriously consider the idea. To some extent, policy diffusion occurs naturally through peer-to-peer contact, but the process could be accelerated through a concerted national outreach campaign to encourage more state and local agencies to adopt purchasing policies. In addition to simply getting more jurisdictions involved, the following specific areas of opportunity deserve more attention:

Outsourcing and "indirect" procurement. With increased outsourcing of government services, contractors rather than government employees are making many decisions in government facilities. Thus, energy efficiency criteria should also be built into contracts for construction, operation and maintenance, and related services (Coleman and Shaw 2000). Efficiency criteria are already used as default values in guide specifications (master specs) for government construction in Wisconsin, California, and Massachusetts.

Program "leverage." Another form of indirect influence on purchasing comes from the role of states and many local jurisdictions in providing grants, regulatory oversight, and technical assistance for capital projects or equipment acquisitions by other entities. Wisconsin, for example, requires low-income weatherization programs and local housing authorities to specify ENERGY STAR or FEMP-recommended products whenever they use state (or federal) funds.

School and institutional purchasing. School districts, public universities, and hospitals offer major opportunities for energy-efficient purchasing of HVAC equipment, lighting, office and food service equipment, and for specialized items such as school buses or medical equipment.

e-Procurement. The growing use of on-line procurement for solicitations, contracting, and retail purchasing by government customers, represents both a barrier and opportunity to energy-efficient purchasing. Continued decentralization of purchase decisions represents the barrier. One opportunity is the ability of on-line systems to flag energy-efficient products and selectively direct buyers to these products. While these ideas are mainly hypothetical, the Washington DC government is currently coding energy efficiency data into a new on-line procurement system, and the two federal government supply services provide options to search for ENERGY STAR and FEMP products.

Tracking sales data or indicators. Another area of opportunity would use the capability of on-line procurement to track sales of energy-efficient products, as Washington DC intends to do. Collecting sales data manually is often beyond the means of state or local purchasing offices. However, the Massachusetts example (above) shows that agency contracts can require government vendors to report sales of energy-efficient products.

New-technology procurement. Another of opportunity involves government as an early user of new technologies (Ledbetter et al. 1999). Government can use both its buying power and symbolic influence to create an entry market for promising new

technologies, lowering the (perceived) market risk for innovative suppliers and encouraging other buyers to follow suit. Successful past examples range from auto seat belts and air bags to efficient apartment-size refrigerators for public housing, and the first ENERGY STAR computers with power management features. Recent federal "technology procurements" targeted high-performance rooftop air conditioners, room air conditioners, improved CFL ceiling fixtures, and the examples mentioned earlier of low-rolling-resistance tires and energy-efficient laboratory equipment.

Moving Forward: The Case for Intergovernmental Collaboration

There is considerable potential for more collaboration on energy-efficient purchasing, among jurisdictions and across the three levels of government. This would offer mutual benefits and build on the tradition of "cooperative procurement," both between state government and municipalities and, to some extent, interstate (e.g., Western States Contracting Alliance, http://www.aboutwsca.org/). Key benefits include:

- Sharing experience – Barriers and solutions for energy-efficient purchasing are to some extent local. Both procurement and energy meetings are an opportunity to exchange information; it would be even better if the national procurement and energy organizations (NASPO, NIGP, PTI, NASEO) were to work together to convene discussions across all three levels of government.
- Avoiding reinventing wheels – There are opportunities to share model contracting language and technical specifications for energy-efficient products. Developing and updating data bases on efficient products and vendors can be a joint effort.
- Increased visibility and market aggregation – To maximize their impact as market leaders, cities, states, and federal agencies need to adopt the same purchasing standards and openly announce this to manufacturers and suppliers. Wisconsin's VendorNet demonstrates this market aggregation on a state level. Opportunities to aggregate demand for ENERGY STAR appliances, equipment, and lighting in public housing could emerge from a recent federal interagency Memorandum of Understanding (http://www.hud.gov/news /releasedocs/mou.pdf).

Intergovernmental cooperation and market aggregation are unlikely to happen by themselves. A more active role on the part of federal agencies, as well as states and cities, will help to move us more quickly to realize the potential for a nationwide system of public sector leadership in energy-efficient purchasing.

References

(See additional source documents at http://www.pepsonline.org/countries/usa.html)

Coleman, P. and A. Shaw. 2000. "Guide Specifications: An Overlooked Avenue for Promoting Building Energy Efficiency." *Proceedings* of the 2000 ACEEE Summer Study on Energy Efficiency in Buildings. Asilomar, CA. August.

Dolin, J. and N. Raynolds. 1998. "The ENERGY STAR® Purchasing Initiative." *Proceedings* of the 1998 ACEEE Summer Study on Energy Efficiency in

Buildings. Asilomar, CA. August. http://enduse.lbl.gov/Info/ACEEE-ESTAR Proc.pdf

Federal Register. 2001. "Part 23—Environment, Energy and Water Efficiency, Renewable Energy Technologies, Occupational Safety, And Drugfree Workplace." *Fed. Reg*. 66:243, December 18. http://www.eere.energy.gov/ femp/pdfs/far_rule1201.pdf

Grandy, D. 2004. Calif. Dept. of General Services. Personal communication, 2/20/04.

Harris, J. and F. Johnson. 2000. "Potential Energy, Cost, and $C0_2$ Savings from Energy-Efficient Government Purchasing." *Proceedings* of the ACEEE Summer Study on Energy Efficiency in Buildings. Asilomar, CA. August. LBNL Report 45439. http://www.dc.lbl.gov/~harris/downloads/Government%20Purchasing.pdf

Koyama, K. 2004. California Energy Commission. Personal communication, 5/3/04.

Ledbetter, M. et al. 1999. "U.S. Energy – Efficient Technology Procurement Projects: Evaluation and Lessons Learned." Pacific Northwest National Laboratory Report PNNL-12118. Richland WA. February. http://www.pnl.gov/buildings /lessons_ learned_ab.PDF

[Mass. OSD]. 2003. "Program Assessment for the Commonwealth of Massachusetts Environmentally Preferable Products Procurement Program." Report by Northeast Recycling Council, Inc. to the Massachusetts Exec. Office for Admin. and Finance. April. (with Appendices) (http://www.state.ma.us/osd/enviro /INFO /finalreportdec02.doc).

Scharer, M. and D. Pratt. 1990. "Integrating Energy Efficiency into Municipal Purchasing Decisions: Defining the Framework." Report by Seattle City Light to the Urban Consortium Energy Task Force.

Schlegel, J. and R. Prahl. 1994. "Market Transformation: Getting More Conservation and Energy Efficiency for Less Money." *Proceedings of the 1994 Affordable Comfort Conference.* 67-80. Waynesburg, PA.

Southwest Energy Efficiency Project (SWEEP). 2003. "Energy Efficiency Bill Will Cut Energy Costs in State Facilities in Arizona." Press Release, 4/29. (www.swenergy.org)

---

† This work was supported in part by the Office of Energy Efficiency and Renewable Energy, US Department of Energy, under Contract No. DE-AC03-76SF00098, and by the ENERGY STAR Program, Office of Air and Radiation, US EPA.