State of Tennessee Pilot Project

performed for
The Consortium for Energy Efficiency

In collaboration with
The U.S. Department of Energy
The U.S. Environmental Protection Agency
and
The Energy Efficient Procurement Collaborative

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Final Report

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A. Background and Perspective

The State of Tennessee has a population of 5,368,000, making it the 17th most populous state in the nation. Last year, Tennessee's population grew 1.1%. Its labor force size is 2,753,700, of which 2,672,000 are employed, all but about 10,000 in nonagricultural jobs. The per capita income in the State is $21,764. Tennessee's principal industries are manufacturing, services, tourism, insurance, finance and real estate.

Tennessee's state government has 23 departments, each of which has one or more agencies. The State's annual budget is $14.419 billion. The Tennessee Valley Authority, a federal government agency, is a major provider of electricity to the Tennessee State government. It charges, on average, about $0.03 per kWh.

The State owns approximately 350 buildings with a total of 72 million square feet and an asset valuation of about $4 billion. The State leases another 200, mostly smaller, facilities. Tennessee's annual energy budget for the buildings it owns is between $80 million and $100 million. About 10% of this amount is for the buildings managed by the Department of General Services.

I. Organization

Procurement

The State of Tennessee has four separate procurement organizations, three of which - the Purchasing Division in the Department of General Services, the University of Tennessee purchasing unit, and the purchasing units supervised by the State Board of Regents - are overseen by the State Board of Standards (see Attachment 1). The latter two organizations are required to adhere to the Board of Standards' policies and procedures, but only insofar as practicable. They must still use state contracts unless they can buy products at lower cost. The fourth state procurement organization is the Department of Transportation. The State Board of Standards does not oversee its procurement of materials used for road construction and improvement. However, these purchases are largely irrelevant to the EnergyStar® program. This pilot project focused on the Purchasing Division.

The Purchasing Division in the Department of General Services is the State's central purchasing unit and it is responsible for commodity purchases (see Attachment 2). The Division includes five buying teams, each of which manages a specific set of products. A Supervisor directs each team, and two Purchasing Administrators oversee the Supervisors. In addition, a third Purchasing Administrator is responsible for the non-buying functions of the Division.

Each state department, institution and agency has one or more procurement groups to help meet the purchasing needs of the organization. Each state organization must

designate a Procurement Officer who initiates all procurement documents and who is responsible for all communications with the Purchasing Division. For example, purchase requisitions that are sent to the Purchasing Division must first go through the agency's Procurement Officer.

Capital Projects

The State of Tennessee has three separate building construction and renovation units (see Attachment 3). These are the Division of Capital Projects and Real Property Management, the University of Tennessee Office of Facilities Planning, and the State of Tennessee Board of Regents' Office of Facilities Development (which constructs facilities for all other state universities, community colleges, and technical institutes). The State Building Commission has authority over the Division of Capital Projects and Real Property Management. It oversees, but does not manage, the major capital projects of the other two units. This pilot project focused on the Division of Capital Projects and Real Property Management.

The Division of Capital Projects and Real Property Management, the central facilities unit for the State, is responsible for building construction and major renovations (see Attachment 4). Within it, the Technical Services unit does in-house building design. Technical Services also includes an Energy unit that promotes the use of energy-efficient products and designs. The Design/Construction unit oversees third-party building design and construction. The Planning & Procurement unit does master planning and also manages the RFP process to obtain services, such as construction management.

II. Staffing Levels

As shown by the numbers in parentheses in Attachments 2 and 4, the Purchasing Division has about 43 employees, while the Capital Projects unit has about 25 employees. In both cases, these figures do not include vacancies or secretarial support.

III. Primary Function

Procurement

The Purchasing Division is responsible for registering bidders and maintaining bidders lists, preparing Invitations to Bid, processing bids, selecting the best vendor(s), preparing and administering statewide and agency contracts, and managing the complaint process.

The Division also processes agencies' purchase requisitions, makes non-competitive purchases, and administers the Tennessee On-Line Purchasing System (TOPS). The Purchasing Division maintains the TOPS system for use in processing all purchasing documents. In addition, TOPS includes all registered vendors, and it has most

additional purchasing approvals built in, e.g., the Office for Information Resources must approve computer equipment purchases.

Capital Projects

The Capital Projects unit of the Division of Capital Projects and Real Property Management is responsible for both facility design management and construction management. The design management function includes overseeing project design and administering the bidding process. The Tennessee Architectural Services (TAS) section also provides in-house design, usually for smaller projects. Construction management includes reviewing the design phase for constructability, overseeing construction, and resolving litigation.

IV. Annual Capital and O&M Budgets

For fiscal year 1998, purchases made by the Division of Purchasing totaled $243 million. Of this total, between 75% and 80% was purchased under statewide or agency term contracts.

The Division of Capital Projects and Real Property Management is indirectly responsible for the purchase of products placed in new or renovated buildings, including major purchases of energy-using products such as HVAC. However, third-party contractors make these purchases, and their amounts, although very sizable, are not available.

V. Highlights of the Procurement Function

This section discusses certain specific aspects of the procurement function and the capital projects function that are particularly relevant to the issue of energy-efficiency.

Procurement

When a state agency wants to buy a product, it must buy from a statewide or agency contract, if one exists. The Division of Purchasing sets the specifications for these contracts, with input from the customer state agencies. If a product is not on a statewide or agency contract, and if it is $2,000 or less, then the state agency can buy the product on its own. If the product is over $2,000, then the Division of Purchasing must handle the purchase.

If the purchase is one-time and over $2,000, or if it will require a new agency contract, then the agency must provide the Division of Purchasing with the brands and models of two or more products that satisfy the agency's specifications. In addition, the agency either also provides its specifications for the desired product or the agency and the Division of Purchasing work together to develop the specifications. These specifications are often derived from information about the two specific product models

that are acceptable to the agency. The Purchasing Division, with the requisitioning agency's approval, may change the product specifications, for example to allow for more competitive products or to meet the requirements of multiple state agencies.

It is important that vendors be made aware of any changes to the criteria used for bid evaluation, e.g., the addition of energy-efficiency specifications. In Tennessee, pre-bid conferences are always held before statewide contracts are bid out, and that could be one time that new energy-efficiency specifications could be introduced and explained to the vendors. Often, however, these conferences are poorly attended. Of course, the Invitation to Bid would itself contain any new energy-efficiency specifications.

TOPS is to be used by agencies to order products that are already on contract. Thus, energy-efficient products must be in the TOPS system before agencies can begin ordering them.

Capital Projects

A new capital project begins when the owner-agency provides data and information about its need, and estimated construction costs, to the Division of Capital Projects and Real Property Management. The Division of Capital Projects and Real Property Management refines these data, including the agency's cost estimates, and then meets with the State Architect to present the project. The budget for the project is set, on a preliminary basis, at this pre-agenda meeting which occurs before approval is requested from the State Building Commission. Thus, any additional cost that would arise from the use of energy-efficient concepts should be included in this early planning stage.

The Energy unit, now part of the Division of Capital Projects and Real Property Management, was located in the Purchasing Division until about a year ago. When it was in the Purchasing Division, it was able to help promote energy-efficiency for products bought by that Division or from contracts negotiated by it. In its new location, it is positioned to educate and influence the State architects and engineers involved with new building construction and building renovation, but it has less direct influence over the Purchasing Division.

The State of Tennessee entered into the EPA's EnergyStar® Buildings Program earlier this year.

VI. Importance of Energy-Related Products

Procurement

As shown by the table in the immediately following section, EnergyStar® related products represent about 5% of the Division's total annual purchases. Over 70% of these energy-related purchases were for microcomputers, which are mostly energy-efficient. Another 20% were for copiers that were rented rather than purchased,

although energy-efficiency could of course be a specification for rented as well as purchased products.

After microcomputers and copiers, the next largest category of energy-related products is lamps and ballasts, which represent slightly more than 5% of energy-related purchases. The Division of Purchasing, working with the Energy group in the Division of Capital Projects and Real Property Management, has made available EnergyStar® lamps and ballasts. The Energy group specified EnergyStar® products, and provided the Division of Purchasing with two representative brands and models, as required by procedures. The Department of Corrections, using free labor, replaced many of its lighting fixtures in one of its prisons with these energy-efficient products as a test. Furthermore, the Parks Department has also begun buying EnergyStar® lamps and ballasts from this state contract. While this does not represent a complete conversion to EnergyStar® lighting products, it is a major step and presents the opportunity for other agencies to follow these examples.

Capital Projects

No information is available on the annual dollar amount spent on energy-using products as part of new construction and renovation projects. It is likely, however, that the amount is considerable.

VII. Profile of Past Years Energy Related Purchases

For the period 7/1/98 to 5/1/99, which is the period for which the most recent data are available, the following dollar amounts of energy-related products were purchased under contracts negotiated by the Division of Purchasing:

Product	Dollar amount purchased	Percent of total
Air conditioners	$ 37,462	0.3%
Copiers (rented, not purchased)	2,352,304	21.2
Floor machines	50,234	0.5
Ice making machines	9,803	0.0
Lamps and ballasts	581,383	5.3
Microcomputers and peripherals	7, 885,831	71.0
Refrigerators/freezers	3,464	0.0
TV sets	135,472	1.2
Vacuum cleaners	41,386	0.4
Washers and dryers	14,753	0.1
Water coolers	2,584	0.0
Total	$11,114,676	100.0%

The $11 million in the table above is 10 months' worth of purchases so, assuming that purchases are evenly distributed throughout the year, a reasonable estimate of the yearly total of EnergyStar® related purchases is $13.3 million.

It should be observed that, during the period noted above, there were some EnergyStar® products that the Division of Purchasing did not buy at all under contract. These included non-residential HVAC, electric motors, transformers, dishwashers, ovens, ranges, and water heaters.

The above numbers do not include purchases of energy-using products made in connection with building construction or renovation. While these numbers are unavailable, it is virtually certain that they are far greater than the $13 million delineated above.

B. Findings - Procurement Process

I. Guiding Regulations

Procurement

The key document for the buyers in the Purchasing Division is the *Agency Purchasing Procedures Manual, Revision Six*, which was approved by the Board of Standards on November 28, 1998. The manual requires that contracts be awarded to the lowest responsive and responsible bidder, and it allows for, but does not require, inclusion of the "total cost of operation" in the definition of "lowest responsible bidder." This means that life cycle cost, and thus energy-efficiency, are consistent with the *Agency Purchasing Procedures Manual* as it exists today. The *Manual* also states that product specifications must be "open and competitive," and that the Purchasing Division may modify them, with the change approved by the requisitioning agency.

The *Agency Purchasing Procedures Manual* further states that, if the long-term performance of some brands is unknown or questionable, then life cycle cost should be used.

The *Manual* also allows for single source purchases when the product is patented, unique, or superior to all other similar products. In that case, prior approval of the purchase is required from the Commissioner of General Services.

Capital Projects

The primary document governing the construction operations of the Division of Capital Projects and Real Property Management is the *Designers' Manual*, revised January 1998. The *Manual* describes the phases by means of which construction projects are carried out. Both in-house and third party architects, engineers, and consultants must follow it. Energy-efficiency is mentioned in three project phases. In the Schematic Design Phase, one step is to *review the conceptual energy analysis, if required*. In the

Design Development Phase, one step is to undertake an *energy use analysis, if required.* Finally, in the Construction Documents Phase, one step is to *confirm the energy analysis.* None of the steps relating to energy-efficiency appears to be mandatory, and in most cases these steps are apparently not being carried out on current projects.

The *Designers' Manual* is currently being revised to introduce energy-efficient facility design requirements, and the revision may be broadened to also require the use of energy-efficient products, as well. Consistent with this, the Capital Projects organization may require that building designers provide a life cycle cost estimate, in addition to the standard construction cost estimate.

II. Other Internally Required Analyses/Procedures

Some years ago, the Division of Purchasing was required to use life cycle cost in buying washers and refrigerators. At that time, there were no guidelines, the process was very time-consuming, and little information was available about energy-efficient products. Furthermore, vendors reportedly complained that the decision process was unfair. Eventually, the program was abandoned.

III. Final Criteria/Bases for Product Selection

Procurement

On product purchases, the State must accept the bid from the lowest responsive and responsible bidder, although it is permissible that the definition of lowest be determined by life cycle cost. All bid evaluation criteria must be explained clearly in the Invitation to Bid, and no other criteria may be used in the evaluation and selection process.

For one-time purchases, the state agency requiring the product gives the Division of Purchasing the specifications that must be satisfied. The Division of Purchasing can encourage the agency to include an energy-efficiency specification, but it cannot require that this be done.

On state contracts, the Division of Purchasing determines the specifications, often with the help of the state agencies that require the product. Thus, in these cases, energy-efficiency specifications could be included without the approval of other state agencies. If the first cost of energy-efficient products is only slightly higher than costs for products previously purchased, agencies might not notice, or not be concerned with, the increase.

Currently, the Purchasing Division has no energy efficient specifications for office equipment. The biggest category is microcomputers and these also have no energy efficiency specifications. The Division has no way of knowing if microcomputer users disable the sleep mode when it is available. The Office for Information Resources is primarily responsible for developing specifications for computers, monitors, printers,

network devices, etc. The Division of Purchasing could, however, suggest that the Office for Information Resources include energy efficiency in its specifications, and the two organizations could work together to implement the change. It is likely that the Office for Information Resources would begin the process by suggesting the idea at one of its monthly meetings with the agencies' information resources personnel.

Capital Projects

With respect to new or renovated buildings, the facility designer essentially determines the products that will be purchased as part of a construction or renovation project, and the cost of those products is part of the overall project cost. Normally, designers build "off-the-shelf" products into their design specifications and cost estimates. For new buildings and building renovations, the increase in first cost from using energy-efficient products and designs might be noticeable and thus could become an issue.

IV. Planning Cycle/Timing of Decisions

The State of Tennessee is on a fiscal year that runs from July 1 to June 30. No budget, and no contract, can extend for longer than 12 months. If a state contract appears to be for a longer period, it is really resigned every 12 months. Similarly, departmental and agency budgets are only established for 12 months, and less thought may be given to future periods than to the current one.

The Division of Purchasing often has limited time to plan for and complete a statewide contract, and the decision criteria must be explained to vendors and included in the Invitation to Bid. Thus, time can definitely be a factor if changes to purchasing procedures or product specifications are contemplated.

Similarly, capital projects often have time constraints as well. Both the internal state architects/engineers and third-party consultants are often under time pressure to complete their work.

V. Standard Inputs/Information Sources

Procurement

Most statewide and agency contracts are not new, i.e., they are renewed regularly. Thus, a prior period's contract provides information for the new contract. When a new product is to be put under contract, or purchased on a one-time basis, the Division of Purchasing should receive specifications from the requisitioning agency, along with two compliant brands/models. If the agency can only find one such brand/model, then the Division of Purchasing assists it in finding others.

The Division of Purchasing has access to the Worldwide Web, and that is one source for information. Another source is the list of registered vendors that the Purchasing Division maintains.

Capital Projects

The Division of Capital Projects and Real Property Management does not normally specify energy-using products directly. That is done by third party consultants, architects, and engineers. These parties usually plan to utilize “standard” products at “standard” costs.

VI. Personnel Involved

Procurement

In a typical commodity purchase, only the requisitioning agency, the Purchasing Division, and vendors are involved. In some special cases, such as for computer equipment, approvals are required from other agencies before the purchase may be made. The Director of Purchasing may change the product specifications in statewide contracts without approval from other organizations, although in practice those changes would be confirmed with the procurement units in the departments that are the major users of the products.

Capital Projects

In a standard construction project, the requesting agency, the Division of Capital Projects and Real Property Management, the State Architect, the Board of Standards, and third party architects, engineers and construction organizations are involved.

VII. Sign-off Responsibility and Thresholds – Flow Diagram

As shown on Exhibit 5, state departments, agencies, and institutions identify a need for a product. These state organizations have authority to purchase from another state agency, and this must be done if there is a state agency that supplies the desired product. In addition, almost all statewide contracts and agency contracts include Direct Purchase Authority. This means that the user agency may purchase any amount of products from those types of contracts, e.g., they may issue a purchase order directly to the vendor specified in the contract.

For purchases of products that are not available from a state agency, and for which there is no statewide or agency contract, the procedure depends on the amount of the purchase. State agencies have Local Purchase Authority to make purchases entirely on their own if the amount is under $400.00. In this case, no purchase order is required, and competitive bidding need not be used. If the purchase will be for more than $400.00, but no more than $2,000.00, then the agency may still make the purchase on its own. However, in this case, a purchase order is required and there must be competitive bidding (with three or more bids whenever possible).

For purchases over $2,000, the requesting agency must submit a requisition to the Purchasing Division. The agency should include the number of units it requires, its product specifications, and two brands and models that meet those specifications. Then the Purchasing Division prepares and issues an Invitation to Bid. The Division secures and evaluates the bids. These bids may be informal (telephone bids or informally written) if the purchase amount is no more than $10,000.00. The Purchasing Division then awards the bid to the lowest responsible and responsive bidder whose bid meets the requirements and criteria set forth in the Invitation to Bid. It does not appear that one-time purchases are made on a life cycle cost basis. They are normally done on a low first-cost basis.

In very special and limited circumstances, a state organization may ask for Agency Delegated Purchase Authority. This might be requested, for example, if the agency needs to repair some specialized equipment in a remote location. The agency must request that the Purchasing Division approve this authority, and the Board of Standards must concur. In this case, the agency obtains a list of registered vendors from the TOPS system, issues an Invitation to Bid, evaluates the results, and selects a vendor.

Finally, state organizations may circumvent the usual procedures to make Emergency Purchases, after first receiving approval from the Purchasing Division. In situations, such as after hours or on weekends, when the Purchasing Division is not immediately available to give its approval, the agency may make an Extraordinary Emergency Purchase, which the Purchasing Division approves after the fact.

The State of Tennessee does not yet use procurement cards. They are likely to be introduced in the near future.

VIII. Financial Parameters

The State of Tennessee is averse to borrowing money, and its bond rating is quite good. Normally, the State will not purchase an item unless it is able to pay for it immediately. Reportedly, changing this attitude might be difficult to accomplish.

IX. Potential Efficiency Gains

Procurement

While efficiency gains within the Division of Purchasing are still possible, it appears that they would not be major. The vast majority of energy-using purchases are for microcomputers, and they are already mostly energy-efficient. Copiers are rented, although energy-efficiency could still be specified. The next largest energy-using product category is lamps and ballasts, and the Division already has EnergyStar® products on a statewide contract, although usage of that contract could be promoted. Thus, while further energy-savings are possible within the Purchasing Division, they may not be sizable.

Capital Projects

The Planning and Procurement unit is preparing an RFP for an Energy Savings Performance Contract. The Energy unit will assist in overseeing the contract and the Energy Service Company (ESCO) when it is hired. The ESCO will implement energy saving infrastructure projects and be reimbursed from the energy savings resulting from the project. Once the contract is over and the ESCO has been reimbursed, all future energy savings will accrue to the State. Mid Tennessee State University is the likely site for the first ESCO contract, in part because there already is an individual in place there to help manage the effort.

The Capital Projects organization recently renovated the Tennessee Tower, one of the State's largest office buildings. One of the goals of the renovation was to make the building more energy efficient, and it is believed that energy costs for the building will be reduced by as much as 50%.

Mid Tennessee State University recently implemented an energy efficiency project that resulted in considerable savings in energy costs. However, the savings from that project are going back into the State's general fund, and Mid Tennessee State University's energy budget will be reduced as well.

The Energy unit in the Division of Capital Projects and Real property Management believes that it can reasonably expect a 40% - 60% reduction in the State's $80 million energy bill after all buildings have been retrofitted for energy efficiency.

X. Comments/Suggestions Regarding the EnergyStar® Purchasing Toolkit

Most interviewees had not yet reviewed the EnergyStar® Purchasing Toolkit at the time they were interviewed. However, one interviewee who had reviewed the Toolkit did mention that all of the products in it should also be on the included Excel spreadsheet.

Several interviewees also mentioned that, for each EnergyStar® product or product category, the Toolkit should contain information showing the amount of money that can typically be saved by switching to the EnergyStar® product.

XI. Other

Some potential barriers to buying energy-efficient products became apparent during the site visit:

Procurement

The State's cost of electricity is relatively low, so energy savings, at least at the moment, may appear to be less important than in other parts of the country where electricity costs are higher. Also, some people believe that negotiating even a modest decrease in the price per kWh of energy would produce savings in excess of those

generated by energy-efficient products. One obvious response to this is to note that both actions can, and should, be taken. Also concrete examples of energy savings from buying efficient products would help as well.

Some vendors might complain, to the Commissioners and others, if energy-efficiency specifications are introduced. Many products are bought from distributors who may not know the energy-using characteristics of their products. They would need to get them from the manufacturer. For example, one interviewee was unaware if energy usage is readily available for the many brands of copiers on the market. However, about ten years ago, the Division of Purchasing began using life cycle cost over five years as one of the specifications for window air conditioners. Thus, for this product, they awarded the contract to the lowest responsive and responsible bidder based on life cycle cost. There was no difficulty in implementing the statewide contract in this new manner, and there were no complaints from vendors at the time of the changeover.

Any new procedures for incorporating energy-efficiency into product specifications must be simple, mechanical and quick. The bid specifications should contain very precise data requirements for energy usage, and the system should be devised in such a way that clerical support can be used to input the data received from vendors. In that way, the buyers would have to do minimal extra work if life cycle cost is implemented.

The Purchasing Officers in the various state agencies will have to be educated about the economic benefit of energy-efficient products. Agencies must buy from a statewide contract if one exists for the product, and they often call to complain that, for example, Wal-Mart's prices are lower. Without education, some agencies will not care about energy savings in future years.

It can be somewhat difficult and time-consuming to get energy-efficient products on statewide contracts. There must be enough perceived volume, it must be possible to find at least two compliant brands/models (and more if possible) that meet the specifications, and those specifications must be fair and yet not too broad to defeat their purpose. For example, the State has LED exit signs on a statewide contract, but many building managers have not been using them.

Capital projects

It is difficult to isolate and measure energy savings, and it can also be difficult to isolate and measure the costs incurred in achieving them, especially if the energy efficiency program is part of a larger effort, such as a building renovation.

Some of the State's architects and engineers may not be knowledgeable about, or interested in, energy-efficient products and, when under time pressure, they may not specify them, or even consider them.

The third-party designers hired by the State are appointed by the State Building Commission and may not be interested in energy-efficiency concepts. The State

Building Commission is given 3 recommended design firms from which to choose, but it can either pick one of the three or choose another firm. Furthermore, the designer's fee is solely a function (a decreasing logarithmic function) of the project's construction budget, no matter how complex or difficult the design work may be. (The construction work, on the other hand, must be bid.)

C. Recommendations

I. Host Organization

The Purchasing Division and the Capital Projects and Real Property Management Division have both made many significant steps toward implementing energy efficiency programs. In particular, the major hurdle of generating interest in, and support for, energy efficiency, has clearly been overcome. These two Divisions have already begun implementing some of the recommendations listed below, and are most likely aware of the need to carry out many of the rest.

Overall

The State's outlook, like its budget, is "one fiscal year at a time." Work toward achieving acceptance of a life cycle viewpoint when doing financial analyses. When faced with potentially higher initial product costs, educate agencies on the value of energy-efficient products based on other benefits, such as reduced maintenance and increased user comfort and convenience, in addition to life cycle cost savings.

Although every state building has its own electric meter, the State currently has a *facilities revolving fund* that is used to pay for energy costs, janitorial services, maintenance, etc. related to state buildings managed by the Department of Finance and Administration. There is only one rate, and it is charged to every agency on a per square foot basis. If energy efficiency programs reduce energy costs in a building, it would reduce the overall costs covered by the *facilities revolving fund* only slightly, and it is unlikely that the State would reduce the per square foot rate at all. Devise a means to measure energy-efficiency cost savings, and to let state agencies keep some of the energy savings that they generate as an incentive for their participation in energy efficiency procurement and facility construction programs.

Procurement

Assign an individual from the Energy unit to work with the Division of Purchasing (even though the Energy unit no longer reports within that Division). This may require adding an additional person to the Energy unit. In this way, the Energy unit can help the Purchasing Division introduce more energy-efficient products and, importantly, communicate the benefits of energy-efficient products to the using agencies of the State.

Continue the process of educating the buyers in the Purchasing Division to the benefits of energy-efficient products. Begin the process of educating the State Board of Standards, as well. Finally, educate the Procurement Officers in the agencies about the value of buying EnergyStar® products.

Begin getting more EnergyStar® products on TOPS. One obstacle that must be overcome in order to get energy efficient products on statewide contracts is the need for enough volume to justify the contract. This is something of a chicken-and-egg issue. Request that the Board of Standards allow lower volume statewide contracts in these cases.

Use the EnergyStar® Toolkit and other information sources to develop clear and precise energy-efficiency product specifications.

Capital Projects

Continue the process of educating the architects/engineers in the Technical Services and Design/Construction units of Capital Projects and Real Property Management regarding the benefits of using energy efficient specifications in new building designs and renovations. Begin the process of introducing energy-efficiency concepts to the State Architect and the State Building Commission.

Educate state agencies about the concept of energy-efficient facility construction and the value of using EnergyStar® products in facility construction and renovation. "Sell" energy efficient products not only on cost savings, but also on benefits such as reduced maintenance cost and increased tenant comfort.

Educate the third party consultants, architects, and engineers about EnergyStar® products and their value. Very often, the State's in-house architects/engineers may listen to their outside consultants rather than to an internal sponsor of energy efficient products. These external organizations tend to be conservative, in part because they do not want to exceed time or cost budgets, but also because of concerns about major problems and their liability for them. One possibility suggested is to develop a "certification" program for third party architects and engineers that would ensure they are conversant with energy-efficient products and knowledgeable in designing energy-efficient buildings.

Implement the idea of revising the *Designers' Manual* to require the use of energy-efficient products. Consistent with this, require that building designers provide a life cycle cost estimate, in addition to the standard construction cost estimate.

Get the Energy unit involved in capital projects very early in their planning. Currently, the unit involves itself after the pre-planning phase, and this may be too late to inject energy-efficiency concepts into the project. When budgets are established, they are usually set using predictably average costs for materials and products. If higher costs will be incurred, recognize them in the budget from the beginning or the designers will

not be able to build them into the plan. Also, budget energy-efficiency requirements in such a way that they will not be sacrificed first when budget cuts are required on the project.

Construction projects must be approved by the State Building Commission, so that group must be in agreement as well. Consider presenting two different budgets to the State Building Commission for the same project. One budget would be for a conventional, i.e., non-energy efficient, building, and the other would be for an energy efficient building. In each case, present the first cost (for building construction), the ongoing annual cost of the building, and a present value of the life cycle cost over a reasonable life span for the structure. Then let the State Building Commission choose the alternative it prefers. It would be beneficial if the first such presentation to the State Building Commission could include an example of a similar, but energy-efficient, building already constructed in another jurisdiction and for which the energy savings were documented and available. This first proposal should include assurances that reports would be produced on a regular basis after construction was complete to document the actual energy savings achieved.

II. Other Similar Organizations

Other states with organizations similar to those in Tennessee could benefit from implementing most of the recommendations listed above. For completeness, they are listed here in summary form:

- Establish energy-efficiency “sponsors” and “ombudsmen”
- Educate both procurement and facility construction personnel about the benefits of energy-efficient products
- Educate user agencies about energy-efficiency benefits
- Develop a “life cycle” viewpoint rather than a “fiscal period” viewpoint
- Ensure that user agencies will share in the energy cost savings that they help to generate
- Begin using some EnergyStar® products, e.g., lamps and ballasts, as “test cases”
- Introduce EnergyStar® product specifications into Invitations to Bid and other procurement documents
- Investigate contracting with an ESCO under a performance contract to redo an existing facility for energy-efficiency
- Educate third party architects and engineers about the value of using energy-efficient products in construction and renovation projects
- Propose both a conventional budget and an energy-efficient budget for construction of a new “test case” facility

III. Purchasing Initiative - Necessary Procurement Tools and Aids

Two initiatives could best be undertaken on a nationwide, rather than state-by-state, basis:

First, develop a web site that has detailed descriptions of energy-saving success stories tailored to state governments, e.g., a correctional facility, a state office building, a fire or police training center, etc.

Second, develop and implement a program to educate and qualify third-party architects, engineers and consultants with respect to energy-efficient products and designs.

D. Implementation Plan

The following table lists the major steps of an implementation plan the State of Tennessee could follow to build upon the considerable energy-efficiency work it has already done:

Step	Status	Time Frame
Use life cycle financial analyses	Just begun	½ to 2 years
Develop a mechanism to share cost savings with state agencies	Not yet begun	½ to 2 years
Develop an interest in energy-efficiency; find "sponsors" and "ombudsmen"	Completed	n/a
Assign an individual from Energy to work in procurement	Not yet begun	2 months
Make more energy-efficient products available in TOPS on a "test" basis; develop energy-efficient product specifications	Ongoing	1 year
Educate employees in the procurement and capital projects functions	Begun	½ to 1 year
Educate users and customers in state agencies about the benefits of energy-efficiency	Not yet begun	1 to 2 years
Revise the *Designers' Manual* and plan for energy-efficiency in an early project phase	Not yet begun	1 to 2 years
Educate third parties, i.e., vendors, architects, engineers, consultants	Not yet begun	1 to 3 years
Submit both a "conventional" and an "energy-efficient" budget for a new facility as a "test"	Not yet begun	½ to 1 year

E. Results

Both of the Divisions discussed above are internally self-motivated to purchase energy-efficient products. The interest and involvement of senior managers has been critical to

the Divisions' successes to date, and it will be key to their future successes as well. Because of its self-motivation, the past successes in Tennessee will no doubt be matched or exceeded by future successes, although they will be more difficult to achieve because the audience for them is more diverse and disinterested. Thus, Tennessee is the case study of a state that is well down the path to energy-efficiency, but that still has some significant roadblocks and challenges to overcome.

Other states can learn from the steps that Tennessee has taken, and how it has addressed obstacles in its path. On the other hand, some states may have already overcome the same internal challenges still facing Tennessee, and learning how this was done would be helpful. External barriers, e.g., educating third party architects, could be met most efficiently by means of a broad-based, concerted effort. In summary, though, Tennessee has made an excellent start toward energy-efficiency, and it will surely continue its successes in the future.

Exhibit 6

List of Interviewees

Department of General Services
Purchasing Division

Bill Amonett, Purchasing Agent Supervisor

Jim Bryant, Purchasing Agent Supervisor

Phil Campbell, Purchasing Agent Supervisor

Reed Cooper, Buyer

Ken Hackett, Purchasing Administrator

Sondra Howe, Purchasing Administrator

Ronnie Staudt, Buyer

George Street, Director

Bryan Sweeney, Purchasing Agent Supervisor

Department of Finance and Administration
Division of Capital Projects & Real Property Management

David Edmunds, State Building Energy Management

Don Graham, Architect/Project Manager

Mary Charlotte Hall, Planning & Procurement

Ludmella Lubarsky, State Building Energy Management

R. Douglas Roberts, Jr., Principal Architect/Project Manager

Ken Scalf, Director, Technical Services Management

Herb Stonebrook, State Building Energy Management