

**City of Portland
Procurement Research and Assessment of Options
for Energy Efficient Purchasing**

**Final Report
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**For
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Executive Summary

The purpose of this project was to conduct a pilot study at the City of Portland to assess existing procurement processes and identify and recommend enhancements for encouraging energy efficient purchasing. To increase our understanding of purchasing within the City, we interviewed City staff, reviewed purchasing guidelines, formed an advisory committee, and worked in cooperation with the City of Portland Energy Office and Bureau of Purchases. Based on this increased understanding, an implementation plan incorporating recommended strategies for encouraging energy efficient purchasing was developed by City staff.

Background

The City of Portland is widely regarded as a leader among its peer organizations. It is one of the largest local governments in the Pacific Northwest. Its progressive environmental orientation makes it a good candidate for adopting practices to encourage the purchase of more energy efficient products. These are some of the reasons Portland was selected for this project.

The City of Portland operates under a modified commission form of government, unusual for cities as large as Portland. In this arrangement, the mayor and city council members set City policy, enact and enforce City laws and act as the direct administrators of bureaus assigned to them.

The primary function of City government is to create a livable city for the people that live and work in Portland. In terms of level of effort and expenditures, the primary functions of City government are public safety and public utilities (water and sewer).

The total City budget (net of internal transfers, including contingency and debt retirement) for the 1998-99 fiscal year is \$1.24 billion dollars. The City spent approximately \$185 million on purchasing in 1998. Major construction accounted for almost three-quarters of these purchases and construction and professional services cover 95 percent of the total purchases.

The City of Portland spends almost \$10 million/year on energy (electricity, natural gas and petroleum fuels). Almost a third of this expenditure is on energy used in buildings. About a quarter is spent on energy for street lighting. The remainder is split between fuel for vehicles, the wastewater plant, and the water utility.

Energy consuming products are essential for carrying out the functions of City government. In buildings the major energy using functions are interior lighting, heating, ventilating and air-conditioning, and office equipment. Outdoor lighting for street lighting and around facilities and parks is another major energy user. Motors operating pumps and wastewater processing equipment are the major energy consuming pieces of equipment for the wastewater plant and the water utility. Vehicles are the other major energy consuming products for the City.

The City of Portland has reduced annual energy costs by \$1 million by implementing a variety of energy efficiency projects as part of the City Energy Challenge Program. The City has not conducted a comprehensive analysis of the remaining energy savings potential in City facilities. We believe that a five- percent reduction in energy costs (\$500,000/year) is a reasonable target for an energy efficient procurement initiative.

Overview of Purchasing

The City of Portland has a central purchasing bureau. The City charter delegates authority to the Bureau of Purchases to manage purchasing for the City. The Bureau establishes purchasing policies and procedures for purchasing that comply with the City Code and Oregon State Law.

The principal mandated goal of the Bureau of Purchasing is "to obtain goods and services the City needs to the City's best advantage." There are four basic principles that guide purchasing policy (City of Portland Purchasing Manual, 1994).

1. Maintaining a competitive environment for purchase of goods and services.
2. Assuring that as many vendors as possible have the opportunity to provide goods and services to the City.
3. Maximizing Minority and Woman Owned Business participation and utilization.
4. Assuring that the basis of award is clear to all parties and applied evenly. Award will be to the lowest responsible and responsive bidder, taking into account life cycle costs, compatibility, service and other factors that figure into total cost.

The specific procedures that apply for a particular purchase are determined by the purchase amount. Purchases over \$41,041 must meet formal purchasing requirements. Purchases equal to or below this amount can use informal purchasing procedures. The informal purchasing procedures are further differentiated between purchases of \$5,000 or less and those between \$5,000 and \$41,041.

For purchases of \$5,000 or less, bureaus make purchases on their own. A limited purchase order is issued or a City credit card is used. The Bureau of Purchases is not involved in these purchases. When making these purchases, bureaus are "responsible for complying with City purchasing policies and state contracting statutes for obtaining the best value for each dollar spent." These requirements include obtaining three quotes for purchases, seeking quotations from qualified women and minority-owned businesses, and buying only from vendors that are certified EEO/Affirmative Action Employers.

For purchases over \$5,000 and under \$41,041 the bureau develops a purchase requisition which is sent to the Bureau of Purchasing. The buyer (in the Bureau of Purchasing) then obtains competitive quotes for the requested product by phone or in writing (a good faith effort is made to obtain quotes from women and minority owned businesses). The buyer selects a vendor (accounting for EEO/affirmative action and

insurance requirements) and produces a purchase order for the product, which is then obtained.

There are some alternative ways to meet the competitive requirements for informal purchases. The city has around 200 annual supply contracts for materials, supplies, or services bought in large quantities or needed by more than one bureau. These annual supply contracts are developed by purchasing as a service to make it easier for bureaus to obtain what they need. They can purchase products from these annual supply contracts and meet competitive requirements.

The City of Portland can also use State of Washington and the State of Oregon purchasing contracts through a cooperative agreement. Purchasing off of these contracts will also meet the competitive requirements. The buyer will look at these various tools available to the City and determine the best way to meet the users need and get the best value for the City.

Purchases over \$41,041 must go through a competitive sealed bid process. Construction projects over \$25,000 must go through this formal process.

The process is different for new construction projects and major renovations. In this case the bureau will hire a design team and develop a complete construction package including the specification of the various components in the building. This package is sent to the Bureau of Purchasing. Purchasing then assembles the construction information from the bureau into a bid package and conducts the formal bid process. Once the winning contractor is selected and any outstanding issues or protests are handled, purchasing is no longer involved. It is the responsibility of the winning contractor to purchase all the products for the building according to the specifications in the construction package. These purchases, which account for the majority of energy consuming product purchases in the City, are purchased outside of the City's purchasing process.

Each individual bureau may establish purchasing procedures or guidelines in addition to those required by the Bureau of Purchases. These may include authorization and processing procedures, internal standards or guidelines for particular products, or certain internal analysis procedures. Given the decentralized nature of City Government, these other procedures are usually specific to a particular bureau.

City staff in the bureaus or project designers develop the product specifications or select the specific products which will be purchased. The key factors that influence which products are selected include maintainability, lifetime, performance (will it meet the performance needs of the application), safety, availability, and price. The significance of each of these factors varies depending on the type of product and whether the product is for new construction or an existing facility. Energy efficiency is not directly considered in these decisions unless there is another reason to select the energy efficient product (such as a utility incentive or improved performance), or if energy efficiency is included in a bureau standard for the particular product.

There are many actors involved in the purchasing process. No one individual is the primary decision-maker in the process. These purchase decisions are not generally isolated, one-time decisions, but usually are influenced by decisions made by others at various points in time. Many actors rely heavily on their peers and on the network of relationships they have established for information.

For example, the development process for new construction can take place over many years with multiple decision points involving a variety of players. A series of tradeoffs and negotiations occur throughout this process in response to changing circumstances, the involvement of different parties, and budget constraints. At the other extreme is the replacement of a failed system in an existing building where a purchase decision may be made in a matter of hours. However, this purchase decision is influenced by the existing piece of equipment, staff experience with the equipment, the presence of any standards for the particular product, and the recommendations of trusted vendors and peers.

Available budgets can constrain the purchase of energy efficient products. Factors such as high bids for new construction or emergency equipment failures can further constrain the purchase of energy efficient products. However, the City has successfully made investments in energy efficiency, both with and without utility rebates. City Energy Policy states the City should promote cost-effective energy efficiency improvements with paybacks of ten years or less. This policy is not aggressively promoted.

A small number of City staff were given the Energy Star Purchasing Toolkit late in our project. For the most part they had not taken the opportunity during the short duration of the project to apply any information from the Toolkit to the work they do. Most City staff deal with commercial type equipment and the standards and product listings for commercial type equipment (such as HVAC equipment) are not as detailed as for some of the residential Energy Star products. A purchasing official suggested that the most important consideration is getting the Toolkit into the hands of individuals that do a lot of purchasing of these types of products. Managers of the central stores for some of the bureaus may be key potential users.

Recommendations

The purchasing process at the City of Portland involves a number of different people in different bureaus purchasing a variety of products using a number of different methods. Creating change within this somewhat complicated framework towards the purchase of energy efficient products is a challenge. Change will take time. Simple isolated strategies are not likely to be successful. It is not sufficient to simply provide more information or a better analysis tool.

Our research has identified some strategies that we believe will effectively encourage energy efficient purchasing at the City of Portland. These strategies are based on our

understanding of purchasing at the City of Portland and the opportunities and needs we identified in our research.

Getting Out the Message – Awareness Raising Activities. Our research suggests that there is a relatively strong environmental ethic within the City of Portland and that staff are aware of and have experience with energy efficient products. However, energy efficiency is not usually considered in most purchase decisions involving energy consuming products. We believe this is due in part to a lack of awareness of how energy efficient products deliver value to the City beyond just energy savings. Thus our first recommendation focuses on raising awareness about the value of energy efficient products.

Goals:

1. Link energy efficiency to things of value
2. Link energy efficiency to environmental benefits
3. Raise awareness of the proper application of energy efficient products

Activities:

- **Get the word out on the relevance of energy efficiency.** Identify product benefits that are important besides energy such as safety, reliability, improved performance, better comfort, reduced maintenance, and other environmental factors. These are the benefits that make energy efficient products relevant.
- **Work with other environmental initiatives in the City.** There are a number of environmental initiatives happening in the City. Incorporating energy efficiency in broader environmental initiatives allows benefits to be leveraged and expands the political base supporting energy efficiency.
- **Develop forums to exchange knowledge and experience with products among City staff.** City staff have a lot of good knowledge and experience to share about products they have used, proper maintenance procedures, how to specify certain equipment, and what guidelines and standards they use. City staff are one of the best resources for raising awareness about the value and application of energy efficiency products.

Encouraging the Purchase of Energy Efficient Products. Our second key recommendation is aimed at making it easy for City staff to purchase energy efficient products. Staff told us that they do not have a lot of time to seek out information on new products such as energy efficient products. There is a tendency to purchase products they are familiar with and that they can get easily through the standard purchasing channels. Staff need to know which energy efficient products they need to consider and they need to know how to easily identify and purchase those products.

Goals:

1. Identify specific energy efficient products that deliver value to the City
2. Get product information about these products to users throughout the City

3. Support the purchase of these energy efficient products

Activities:

- **Analyze the benefits of various energy efficient products and identify those specific products that deliver value.** Identify specific energy efficient products that might benefit the City. The result of this activity would be a specific list of product types (such as LED exit signs) where the purchase of energy efficient products is clearly justified on a life cycle cost basis.
- **Provide information and support to make it easy to buy energy efficient products.** Identify specific brands and model numbers that meet the necessary performance requirements and that the City has had good experience with. Identify where and how to buy these products and work with vendors to make these products available. Develop performance language and specifications that can be used or given to designers or vendors.
- **Develop energy efficiency standards or guidelines for specific products.** Since energy efficiency is not often considered in purchase decisions, some form of standard can be an effective way to ensure that beneficial energy efficient products are considered. Standards or guidelines should be developed for those energy efficient products identified in the previous activities that benefit the City.

We believe that some of the strategies identified for the City of Portland can be successfully applied at other organizations. However, the City of Portland is further along the learning curve towards environmental purchasing as a result of its strong environmental ethic, its experience with energy efficiency, and the presence of a City Energy Office.

We suspect that most organizations would need to lay some groundwork to reach the level the City of Portland is currently at. This would include assessing and developing support for environmental and energy efficiency initiatives, developing experience with energy efficiency products through demonstrations, and identifying responsibility for the energy management function in the organization. Unique opportunities where energy efficiency can meet an important need or solve a problem need to be identified.

In addition to efforts internal to organizations, a broader purchasing initiative is necessary to address the external groups that influence purchasing. Our research has shown that individuals and organizations external to the City of Portland have significant influence on the products purchased by City staff. These individuals and organizations include peer associations, vendors, manufacturers, utilities, and design professionals. These groups influence purchases through the relationships they have with City staff, the information they provide, the products they develop and make available, the programs they offer, and the specifications they develop.

We suggest the following goals for a broad purchasing initiative.

- Make sure energy efficient products can be easily identified and purchased by public organizations through their normal purchasing channels.
- Make sure that complete performance information (including relevant information besides energy efficiency) for energy efficient products is readily available in a form that is useful for users in public organizations.
- Developing purchasing networks to build the demand for environmentally efficient products and create a critical mass of environmental purchasers

Implementation Plan

As part of this project, the City of Portland Energy Office drafted an Implementation Plan for Energy Efficient Purchasing. This plan identifies strategies that lead to the proposed goal of buying energy consuming equipment that is rated in the top 25% in terms of energy efficiency for a particular product category.

The strategies are organized around three common obstacles to the purchase of energy efficient products at the City of Portland: lack of a clear directive from City management, lack of information on how to identify and value energy efficient products, and an emphasis on first cost in the purchasing process.

Information Barrier Strategies: A central element of these information strategies is to clearly establish a City preference for high-efficiency products by adopting “Energy Star or equal” as the standard product requirement when purchasing energy consuming products. This would be implemented by placing energy efficiency language into City procurement documents and guidelines. Training and information resources would be made available to staff along with forums to exchange information. Vendors will be contacted with information about the City's preference for energy efficient products and will be encouraged to respond with product lists and performance information. When possible, the City will take advantage of utility, state, and Federal programs that support energy efficiency.

First Cost Strategies: The central element of the first cost strategies is to authorize and direct that purchasing decisions be based on life cycle cost principles rather than first cost alone. Bid document language will be developed for energy efficient products. Lists of energy efficient products will be developed to make purchasing easier. Vendors will be encouraged to support City staff with life cycle cost analysis. The plan proposes that the City develop a policy that requires construction budgets to include a dedicated set-aside to fund energy design, efficient products and other green building designs that support sustainable principles and exceed code.

Clear Direction from Management Strategies: An important first step is a citywide statement of value or commitment from bureau management that communicates support for decisions to buy high-efficiency products. Individual meetings need to be held with City Commissioners, key bureau managers, and the new director of the Bureau of Purchases. Purchasing energy efficient products can be addressed as part

of the implementation of the Building a Greener Portland Initiative. For construction projects, there need to be high level directives communicated at the beginning of the project that specify the incorporation of energy efficient design and Energy Star rated products.

Next Steps: The City Energy Office will take the lead on refining and developing support for the implementation plan.

Results

The primary result of this effort is the Draft City of Portland Implementation Plan for energy efficient purchasing. This plan is a solid starting point for encouraging energy efficient purchasing at the City of Portland.

We believe that the strong environmental orientation and the existing environmental initiatives within City government provide a positive framework for developing a successful initiative to encourage energy efficient purchasing. The Building a Greener Portland study provides a unique opportunity for energy efficient purchasing to contribute to improving environmental practices in the City. There are plans to rewrite the City purchasing guidelines. This provides an opportunity to incorporate guidelines that encourage the purchase of resource efficient products.

It is our expectation that the purchase of energy efficient products will become one important element in the efforts by the City of Portland to improve environmental practices. By developing more consistent purchasing practices which encourage the purchase of high quality, efficient products, the City will benefit at a number of levels. We believe a reasonable energy saving target for an energy efficient purchasing initiative is \$500,000/year for the City of Portland. However, the benefits of the initiative will go well beyond energy savings.

Introduction

The purpose of this project was to conduct a pilot study at the City of Portland to assess existing procurement processes and identify and recommend enhancements for encouraging energy efficient purchasing. The project began in mid-January, 1999 and ran through April.

We used four primary approaches for meeting the goals of the project.

- Review Existing Materials and Procedures: We reviewed the purchasing manual for the City of Portland, the adopted City budget for 1998-99, City-wide Annual Supply Contracts, and the City web site.
- Key Informant Interviews: At the beginning of the project, interviews were conducted with five individuals. Four of these individuals work in purchasing positions in the Bureau of Purchasing and one is the manager in the department stores for one of the large City bureaus.
- In-depth ethnographic interviews: We conducted 12 interviews with staff at various levels of purchasing. Individuals interviewed included a facility manager, a project engineer, a project manager, maintenance supervisors, and individuals responsible for electrical and mechanical system maintenance.
- Participatory Research: An advisory group of fourteen city staff met on February 17 to discuss energy efficient purchasing, to share experiences with energy efficiency, and to discuss ideas for next steps. The advisory group reconvened on March 16 to follow up on the action items from the February meeting and to discuss strategies for encouraging energy efficient purchasing.

Two individuals, one in the City of Portland Energy Office and one in the Bureau of Purchases, were the key City contacts and partners in this project. These individuals helped organize project events and involve City staff in the project.

The principle products for the project are this detailed project report, a two-page case study summary, and an action plan for encouraging energy efficient purchasing. The action plan was developed by the City of Portland Energy Office and Bureau of Purchases and is summarized in this report. Implementation of the action plan will result in an increase in the purchasing of energy efficient products.

The first section of this report provides background on the City of Portland and why it was selected for this project. Section B describes the purchasing process at the City of Portland. Section C discusses recommendations for encouraging energy efficient purchasing. Section D summarizes the implementation plan developed by the City of Portland for encouraging energy efficient purchasing and Section E identifies the expected results from this project.

A. Background and Perspective

The City of Portland is located in northwestern Oregon. It is the largest city in Oregon and the second largest city in the Pacific Northwest. Portland has a population of 508,500 and is the center of commerce, industry, transportation, finance, and services for an immediate metropolitan area with a population of 1.40 million.

Portland has experienced significant growth over the last ten years, primarily as a result of an aggressive annexation program. The area served has increased by 11 percent with residents served increasing 19 percent. Over the next two decades the Portland Metro area is expected to add half a million new residents.

The City of Portland is widely regarded as a progressive city with a strong environmental orientation. The City recently completed an extensive environmental review of city practices. The review identified a lot of positive things happening within city government in regard to environmental practices, but there is still plenty of opportunity for improvement. Currently, the City is identifying action steps for improving environmental practices, which will be submitted to the city council. The city council is providing strong support for this effort. Energy efficient purchasing is clearly one action step that could be taken.

The City has also formed a Sustainable Portland Commission that will be developing recommendations for the City Council. The City recently joined the Natural Step, an international movement to increase sustainable practices. Several City staff have participated in Energy Star Purchasing Workshops. The City has an active Energy Office that organizes a variety of activities to improve energy efficiency in Portland including the City Energy Challenge Program that has reduced annual energy bills by \$1 million due to energy efficiency improvements.

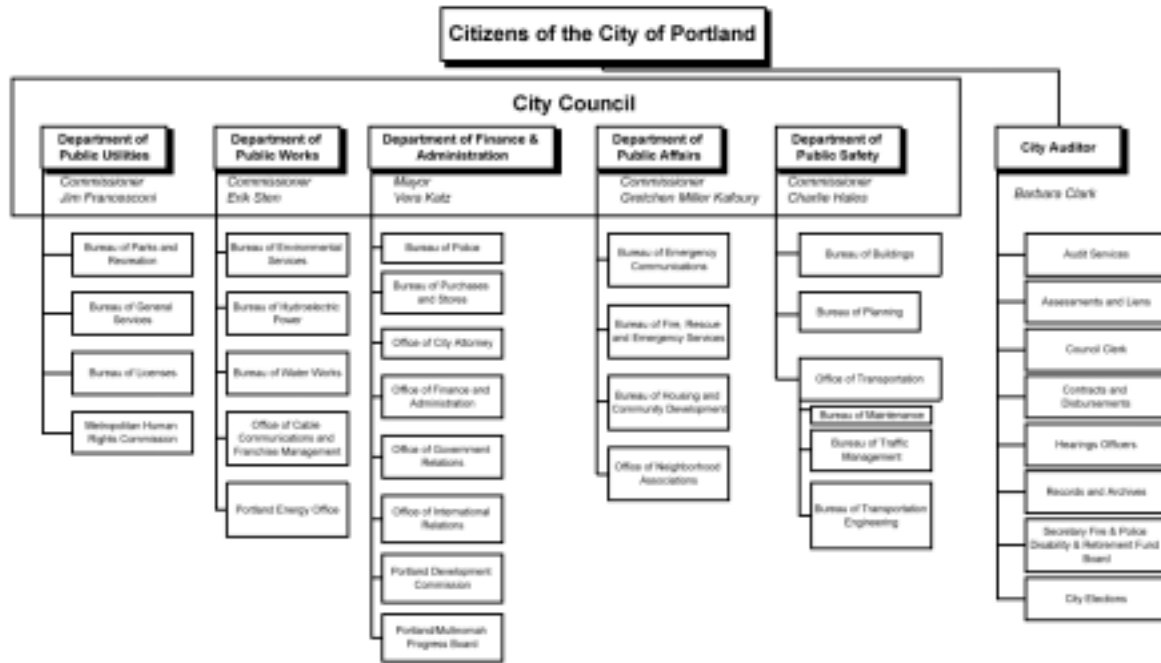
The City of Portland is widely regarded as a leader among its peer organizations. It is one of the largest local governments in the Pacific Northwest. Its progressive environmental orientation makes it a good candidate for adopting practices to encourage the purchase of more energy efficient products. These are some of the reasons Portland was selected for this project.

I. Organization

The City of Portland operates under a modified commission form of government, unusual for cities as large as Portland. Four city council members and the mayor are elected at large to rotating four-year terms. The mayor and commissioners act as legislators and administrators. They are responsible for enacting City laws, enforcing City laws, and administering bureaus under their supervision. The mayor assigns each of the commissioners the responsibility for managing one of five departments: Finance and Administration, Public Affairs, Public Safety, Public Utilities, and Public Works. The mayor also assigns the management of various bureaus to each commissioner. The

mayor can change these assignments at any time. Figure 1 shows the current organizational chart and bureau assignments.

Figure 1. City of Portland Organization Chart



As a result of this form of government decision making in the City of Portland tends to be dispersed. The more than 25 bureaus act relatively independently. Policies may not be applied consistently across all bureaus. Shifts in leadership can result in changes in policy direction within departments and bureaus.

II. Staffing Levels

The City of Portland has 5,200 employees. On a per capita basis Portland has approximately 10.2 employees/1000 population.

City employees are distributed across 38 City offices. The largest offices in order of authorized positions are police; fire, rescue and emergency services; transportation; water; environmental services; parks; and buildings. The first two public safety functions account for almost 40 percent of the authorized positions and the top seven offices listed account for 80 percent of the positions.

III. Primary Function

The motto for the City of Portland is "The City that Works!" The primary function of City government is to create a livable city for the people that live and work in Portland. In

terms of level of effort and expenditures, the primary functions of City government are public safety and public utilities (water and sewer).

The City Council has developed a set of goals that were validated through a citizen involvement process to guide City decision making. These goals are:

- Build a livable city through good planning and well-managed growth
- Support quality education to produce well educated citizens
- Promote economic vitality and access to quality jobs for all citizens
- Maintain a financially stable city
- Ensure a safe peaceful community
- Maintain and improve our parks, green spaces, water and air sheds
- Promote the inclusion of under-represented neighborhoods and groups to participate in city activities and services
- Keep the central city vital
- Build a multi-modal transportation system
- Grow as an international city
- Become a more effective partner in the region
- Ensure decent, affordable housing

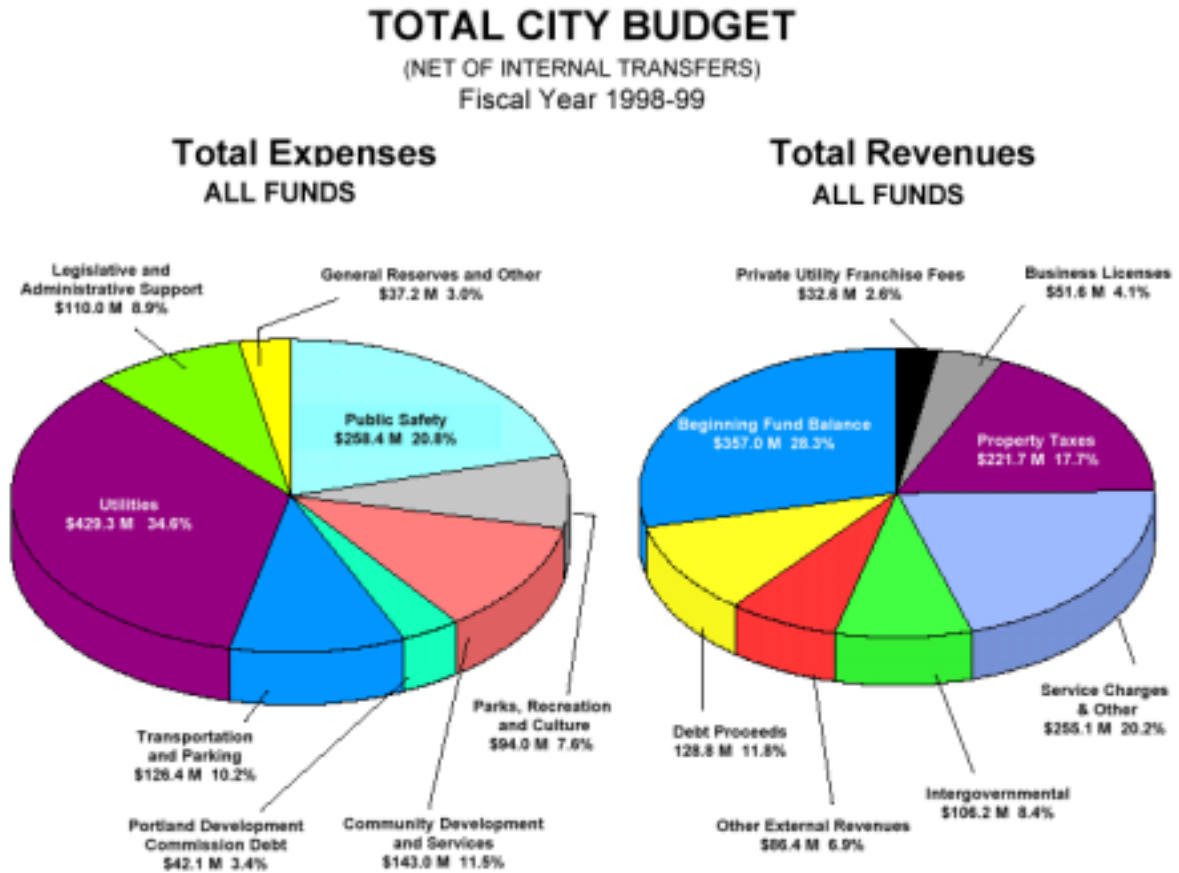
The environmental orientation of the City is reflected in the goals for a livable city, well-managed growth, maintaining and improving parks, green spaces, water, and air sheds, and building a multi-modal transportation system.

IV. Annual Capital and O&M Budgets

The total City budget (net of internal transfers, including contingency and debt retirement) for the 1998-99 fiscal year is \$1.24 billion dollars. Utilities and public safety account for the majority of expenditures (Figure 2). The 1998-99 budget amount is very similar to the previous year revised budget.

The operating budget is \$691 million and the capital budget is \$215 million. Public utilities account for over half the capital expenditures and public safety accounts for over a third of the operating budget.

Figure 2. City of Portland Budget Expenditures



V. Highlight of the Procurement Function

The City of Portland has a central purchasing bureau. The City charter delegates authority to the Bureau of Purchases to manage purchasing for the City. The principle mandated goal of the Bureau of Purchasing is "to obtain goods and services the City needs to the City's best advantage." There are four basic principles that guide purchasing policy (City of Portland Purchasing Manual, 1994).

1. Maintaining a competitive environment for purchase of goods and services.
2. Assuring that as many vendors as possible have the opportunity to provide goods and services to the City.
3. Maximize Minority and Woman Owned Business participation and utilization.
4. Assuring that the basis of award is clear to all parties and applied evenly. Award will be to the lowest responsible and responsive bidder, taking into account life cycle costs, compatibility, service and other factors that figure into total cost.

The City of Portland Purchasing Manual outlines the following responsibilities for the Bureau of Purchases.

- Establish clear, uniform and comprehensive procedures and regulations governing purchasing. These will be written, current, and in the possession of users.
- Procure items that will meet Bureau needs at the least total cost to the City.
- Determine appropriate procedures for various types of purchasing that will best serve the interest of the City.
- Select vendors and issue orders for the purchase of items.
- Authorize emergency purchases.
- Coordinate the bid process on purchases requiring formal bids; include plans and an available list of contractors.
- Recommend to Council the acceptance or rejection of bids on contract purchases.
- Maintain prospective bidders lists, a record of previous purchases, current prices, and other pertinent data (e.g. history of service, quality of product, etc.)
- Provide regulations on vendor-bureau contact for each type of procedure.
- Provide regulations on the detail and comprehensiveness of the specs required.
- Review technical specs when they appear to circumscribe the possibility of competitive purchasing. The Bureau of Purchases will not unilaterally alter specs. Specs can only be changed with the agreement of the user.
- Maintain good relations with vendors and with City bureaus.
- Institute outreach programs to encourage Minority and Women Owned Business participation.
- Conduct orientation and familiarization sessions periodically with bureaus.
- When specs or some other items are incomplete or incorrect, advise the bureau of what is required to correct it. When a vendor returns a purchase order as inadequate, the bureau will be contacted.

There are five buyers¹ (four of these are senior buyers) in the Bureau of Purchasing. Buyers tend to handle different bureaus. One buyer deals with technical services. One buyer is located at the Environmental Services Bureau and does purchasing for the wastewater treatment plant. One buyer handles annual supply contracts (these are multi-year contracts for products or services needed on a regular basis).

Note that the Bureau of Purchases is currently undergoing reorganization. A new director for the Bureau was recently hired.

VI. Importance of Energy Related Products to the Organization's Function

The City of Portland spends almost \$10 million/year on energy (electricity, natural gas and petroleum fuels). Almost a third of this expenditure is on energy used in buildings.

¹ The term buyer is used in this report to identify purchasing officials in the Bureau of Purchases that buy products for the City.

About a quarter is spent on energy for street lighting. The remainder is split between fuel for vehicles, the wastewater plant, and the water utility.

Energy consuming products are essential for carrying out the functions of City government. In buildings the major energy using functions are interior lighting, heating, ventilating and air-conditioning, and office equipment. Outdoor lighting for street lighting and around facilities and parks is another major energy user. Motors operating pumps and wastewater processing equipment are the major energy consuming pieces of equipment for the wastewater plant and the water utility. Vehicles are the other major energy-consuming product for the City.

VII. Profile of Past Years Energy Related Purchases

The City of Portland spent approximately \$185 million on purchases through the Bureau of Purchases in 1998. Major construction accounted for almost three-quarters of these purchases and construction and professional services cover 95 percent of the total purchases (Table 1).

Table 1. Purchasing by the City of Portland in 1998 by Major Category

Type of Purchase	Amount (millions of dollars)
Informal Construction under \$50,000	1.6
Formal Construction over \$50,000	136
Annual Supply Contracts	5.8
Equipment	1.4
Professional Services	40

Note: These values only include purchases handled by the Bureau of Purchases

Energy related purchases occur within each of these categories.

- Construction: Energy consuming systems in buildings include lighting, heating, ventilating and air-conditioning systems, motors, and control systems. For utility system construction projects, energy systems include pumps, motors, and related sewage treatment systems. Given the high cost of many infrastructure development projects, the portion of total construction expenditures for energy consuming equipment is likely to be relatively small, on the order of five to ten percent. However, this is still a substantial amount of money and construction is where the majority of energy consuming products are purchased.
- Annual Supply Contracts: These purchases cover those products and supplies bought on a regular basis or in large quantities. For the most part, these items are not energy consuming. Energy consuming products bought through annual supply contracts include street lighting, and electrical and hardware equipment purchased through companies under contract such as the W.W. Grainger Company. We expect that energy-consuming products account for less than 5 percent of the total annual supply contract purchases.

- **Equipment:** This equipment includes such things as trucks, cars, and computers. We expect that a significant portion (30 to 50 percent) of these equipment purchases may be for energy consuming equipment. However, equipment purchases make up a small portion of total purchases.
- **Professional Services:** These services include architects and engineers hired to develop the designs and specifications for new facilities and renovations of existing facilities.

The purchase volumes in Table 1 include only purchases that go through the Bureau of Purchases. Purchases for amounts of \$5,000 or less are not handled by the Bureau of Purchases (see section B.1). The City estimates that approximately \$20 million/year is spent on these small purchases. A large portion of the energy consuming products purchased for existing facilities are for amounts less than \$5,000.

There are other purchases, such as professional service contracts, development agreements, and projects exempted from competitive bidding, that are not handled by the Bureau of Purchases. We do not believe these purchases involve energy consuming equipment to any significant degree.

The City of Portland has made significant energy system improvements in their facilities. Most of these improvements occurred between 1992 and 1997. These improvements resulted in a significant investment in energy efficient equipment. The local utility provided rebates of \$424,000 to the City for these projects.

B. Findings - Procurement Process

The City of Portland has a central purchasing bureau that establishes the policies and procedures for purchasing by the City. The procedures vary depending on the product and its price. There are a variety of ways that users can meet the purchasing requirements of the City and obtain the products they need. Many purchases involving energy consuming products (such as products for new construction) do not go through the Bureau of Purchases.

Many players are involved in the purchasing process. The players vary depending on the product and whether the product is for new construction or existing facilities. These players rely heavily on their own experience and their network of relationships for information on the products they select. The decisions influencing the selection of a particular product often occur at different points in time and may be made by different individuals.

The factors identified by City staff as important in the selection of products include maintainability, lifetime, performance (will it meet the performance needs of the application), safety, availability, and price. The significance of each of these factors varies depending on the circumstances of the purchase. Energy efficiency is not directly considered in these decisions unless there is another reason to select the energy efficient product (such as a utility incentive or improved performance), or if energy efficiency is included in a bureau standard for the particular product.

This section discusses how purchasing happens at the City of Portland. It reviews the guidelines and requirements for purchasing, the processes and factors that influence which products are selected, the timing of decisions, the roles of the different players in the process, the information and input sources used, some of the financial parameters involved, the potential for energy efficiency improvements, and input received on the Energy Star Purchasing Toolkit.

I. Guiding Regulations

The Bureau of Purchases is the designated purchasing authority for the City of Portland. It establishes purchasing policies and procedures for purchasing that comply with the City Code and Oregon State Law. The procedures for purchasing are delineated by purchase amount. Purchases of over \$41,041 must meet formal purchasing requirements. Purchases equal to or below this amount can use informal purchasing procedures.

The City Charter and the City Code define procurement responsibilities for the City and delegate purchasing authority to the Bureau of Purchases. The Bureau is required to comply with Oregon State Law. The Bureau of Purchases establishes procedures within this legal framework. The City of Portland Purchasing Manual provides users with the procedures, operations, and policies for purchasing in the City.

All City purchases are intended to take place within a competitive process and awards are to be made to the lowest responsive and responsible bidder. A good faith effort is to be made to seek quotations from qualified women and minority-owned businesses. Purchases can only be made from vendors that are certified EEO/Affirmative Action Employers.

The basic procedures for purchasing are delineated by the purchase amount (Table 2). Purchases over \$41,041 must go through a formal purchasing process. Purchases equal to or less than this amount can use informal purchasing procedures. The informal purchasing procedures are further differentiated between purchases of \$5,000 or less and those between \$5,000 and \$41,041.

Purchases Under \$5,000

For purchases under \$5,000 a limited purchase order (LPO) is completed, the appropriate signature approvals are obtained in the bureau, a specific product and vendor are selected, the product is purchased, and the invoice and LPO go to accounting for payment. These purchases can also be made with a City credit card. Note that these purchases are handled within the bureau making the purchase and do not involve the Bureau of Purchases. When making these purchases, bureaus are "responsible for complying with City purchasing policies and state contracting statutes for obtaining the best value for each dollar spent." These requirements include obtaining three quotes for purchases, seeking quotations from qualified women and minority-owned businesses, and buying only from vendors that are certified EEO/Affirmative Action Employers.

Purchases Between \$5,000 and \$41,041

Purchases over \$5,000 and under \$41,041 also fall under informal purchasing procedures. In this case the bureau develops a purchase requisition which is sent to the Bureau of Purchasing. The buyer (in the Bureau of Purchasing) then obtains competitive quotes for the requested product by phone or in writing (a good faith effort is made to obtain quotes from women and minority owned businesses). The buyer selects a vendor (accounting for EEO/affirmative action and insurance requirements) and produces a purchase order for the product, which is then obtained.

Purchases Over \$41,041

Purchases over \$41,041 must go through a competitive sealed bid process. Construction projects over \$25,000 must go through this formal process.

Table 2. Basic Purchasing Procedures by Purchase Amount

Amount	Uses	Procedures
\$100 or less per line item	Misc. supplies and off-premises services.	Petty Cash: Bureau draws from its own petty cash account; document with receipt to reimburse account.
\$5,000 or less	Materials, services and supplies (not for professional services).	Limited Purchase Order: Bureau issues LPO with appropriate approval
\$41,041 or less	Labor, materials, supplies, construction, misc. services and equipment, and professional services (up to \$10,000 only).	Purchase requisition/Purchase Order: Bureau submits PR electronically or on paper to BOP containing required information: specifications, cost estimates, delivery time required, recommended vendor, and other vendor information. BOP reviews PR, selects vendor and issues PO. PO serves as their contract (except where the Purchasing Agent determines a formal written contract is in the best interests of the City).
	Large quantities of regularly required materials, supplies or services needed by one or more bureaus.	Annual Supply Contracts/Contract Release Authorization: BOP locates vendor making offer most advantageous to City and signs contract fixing cost of items and other terms. Bureau may then buy approved items as required with a contract release authorization. No monthly limit. No invoice limit.
	To obtain goods/services immediately due to emergency circumstances.	Emergency Purchase Requisition/Order: During working hours the bureau must contact BOP, certify an emergency, receive an EPO number; it may then purchase the required item or service. During non-working hours the bureau does not require an EPO number. It may purchase the item or service and submit a written justification within 4 hours.
Over \$41,041	Labor, materials, supplies, construction equipment.	Formal Purchasing: Go to bid with appropriate operating bureau approval. Bureau requirements for bid package are described in the Purchasing Manual with award for bid. Contract goes to Council for approval.
	To obtain goods and services required immediately due to emergency circumstances.	Emergency Purchase Requisition/Order: Bureau obtains approval of Commissioner in charge. BOP assigns EPO number and makes purchase. Ordinance must be passed before confirming PO is issued. Outside of working hours, when normal business hours are resumed, EPO is assigned and an Ordinance must be passed before confirming PO is issued.

Note: This table is from the City of Portland Purchasing Manual, June 1994, pages 1-6 and 1-7.

These are the basic purchasing procedures established to meet the principles identified in Section A.V. Tables 1-3 in Section B.VII provide more details on the procedures for these purchases. These procedures provide guidance. In practice there are variations and there are alternative ways to meet the requirements of these procedures. There are certain types of purchases such as the purchase of products for new construction projects that fall outside of the scope of City purchasing requirements. The following subsections review some of these variations and additional requirements that need to be met.

II. Other Internally Required Analyses/Procedures

Each individual bureau may establish purchasing procedures or guidelines in addition to those required by the Bureau of Purchases. These may include authorization and processing procedures, internal standards or guidelines for particular products, or certain internal analysis procedures. Given the decentralized nature of City Government, these other procedures are usually specific to a particular bureau.

Individual bureaus may develop internal purchasing processes in addition to those developed by the Bureau of Purchases. For example, some bureaus such as the Water Bureau and wastewater treatment plant (part of the Environmental Services Bureau) have central stores where products used on a regular basis are stocked. For these bureaus, purchase requests are required to go through the central stores. The central stores manager approves all purchases. LPO's and purchase requisitions are handled by staff in the central stores and purchase requisitions are forwarded to the Bureau of Purchases.

Guidelines and standards exist for the purchase of some products. For the City of Portland, these standards are generally pretty informal. For example, electronic ballasts have become the standard for lighting fixtures at several bureaus. In the Water Bureau, they only buy energy efficient motors. The wastewater treatment plant has developed standards for a variety of products, although these standards are viewed more as guidelines rather than requirements. The Park Bureau has developed product specific lighting standards.

For certain products there are codes or professional standards that must be met. These apply to building systems, water and wastewater systems, and to outdoor lighting. There are standard engineering analysis procedures used to develop the designs and specifications for these systems.

Life cycle costing or other forms of energy analysis are unusual and are not required. Life cycle costing is used for the purchase of vehicles. Life cycle costing is used at the wastewater treatment plant for motor replacements. There is a City ordinance that allows life cycle costing to be used as a criteria for purchase. There is little evidence this ordinance is applied.

There is another City ordinance that allows users to spend up to five percent more for items with recycled content. This ordinance is not widely used by City bureaus to purchase recycled content products.

III. Final Criteria/Basis for Product Selection

City staff in the bureaus or project designers develop the product specifications or select the specific products which will be purchased. There are a variety of ways these products can be selected and purchased and still meet City purchasing requirements. The Bureau of Purchasing is not involved in the product selection process for many of these purchases. The key factors that influence which products are selected include maintainability, lifetime, performance (will it meet the performance needs of the application), safety, availability, and price. The significance of each of these factors varies depending on the type of product and whether the product is for new construction or an existing facility. Energy efficiency is not directly considered in these decisions unless there is another reason to select the energy efficient product (such as a utility incentive or improved performance), or if energy efficiency is included in a bureau standard for the particular product.

The process and criteria used for product selection varies by type of product and whether the product is for new construction or for an existing facility. This subsection reviews the processes used to select energy consuming products for new construction, existing facilities, office equipment, and utility systems.

New Construction

For new construction projects and major renovations, the bureau responsible for the project will hire a design team and develop a complete construction package including the specification of the various components in the building. Engineers (hired professionals) and project managers (City employees) develop the specifications for new construction projects. Users influence what is specified and in some cases are actively involved in making the decisions. Building standards also have an influence, although the standards that exist at the City of Portland are largely informal.

The construction package is sent to the Bureau of Purchasing. Purchasing then assembles the construction information from the bureau into a bid package and conducts the formal bid process. Once the winning contractor is selected and any outstanding issues or protests are handled, purchasing is no longer involved.

It is the responsibility of the winning contractor to purchase all the products for the building according to the specifications in the construction package. The contractor does not have to meet City purchasing requirements. The City project manager has input on the products selected and reviews the selections the contractor makes to ensure they meet the specifications in the design.

Some form of "value engineering " is often applied to new construction projects. This is necessary when project bids come in over budget (which is not uncommon). Value engineering is used to cut costs and bring projects back under budget. It involves identifying alternative, lower cost items that will perform satisfactorily, but not necessarily identically to what was originally specified. Every new construction project involves a variety of subjective tradeoffs. It is in this process of value engineering and subjective tradeoffs that less energy efficient equipment can be substituted into a project. A more energy efficient product is replaced with one that meets the energy code. This is an important aspect of the decision making process for new construction.

It is important to recognize that the process of selecting the features and products that go into a building is a negotiation process that involves a number of different parties and interests. Energy efficient products and features may compete with other environmental improvements (such as a wastewater recovery system), features that improve the quality of the work environment (such as ergonomic furnishings), or features that impact the life and maintenance of the structure (such as a metal roof). There may be advocates for each of these features. The negotiation process takes place over an extended period of time and decisions do change over that time in response to changing circumstances and different players becoming involved in the process. Within this process energy efficiency is of secondary importance. If energy efficiency is incorporated into a building, it is often for many reasons in addition to saving energy. These factors might include financial incentives from the local utility or the desire to use a higher quality piece of equipment that is easier to maintain, lasts longer, and offers improved performance. Another reason might be that the standard product the City uses in its buildings is energy efficient (for example electronic ballasts and T-8 lamps).

Existing Building Systems

The energy consuming elements of existing building systems primarily involve lighting and heating, ventilating, and air-conditioning equipment and their associated controls. For purchases that involve the replacement of this equipment in existing buildings (usually these purchases are under \$5,000), City staff generally just replace the failed equipment with the same or a similar unit. A specification is not written. They tend to identify a specific product. The factors they are interested in are maintainability, lifetime, performance (will it meet the performance needs of the application), safety, availability, and price.

Staff rely heavily on their own experience and the experience of their colleagues with various products in determining which products they buy. They know which products have worked well for them and which have not. Staff will often go to local supply houses where they have established relationships to get information on the products available that will meet the needs of their particular application. Another source used by City staff to identify products that meet their needs are sales catalogs and products such as the Sweets Catalog series. They use vendors to get information on new products or on specific products the vendors offer.

For products under \$5,000, City staff can directly buy the model they need using a City credit card. There are several places they may go to make these purchases.

- Local supply houses where they have received good service and good prices.
- The annual supply contract the City has with the W.W. Grainger Company. City staff can buy any product offered in the Grainger catalog at a specified discount (the discount is determined in a competitive bidding process). A wide variety of products are available through the Grainger catalog including electrical equipment and small HVAC systems at prices that are often difficult to beat.
- Annual supply contracts the City has for specific products such as high-pressure sodium vapor lamps and luminaries and maintenance services.
- State of Oregon or Washington purchasing contracts can also be used to make City purchases. City staff noted that they often use these contracts to purchase fluorescent lamps. The state contract prices for fluorescent lamps are significantly lower than standard prices. Local supply houses will often meet the state contract prices.

Purchases above \$5,000 for the replacement of existing building equipment are unusual. These types of purchases would generally involve the replacement of a major building system component like a chiller. For these types of system replacements, some type of engineering design is often required. As a result, these types of system replacements often resemble a new construction or major renovation project where systems are designed and specified and then put out to bid to a contractor for installation.

Energy efficiency is not a direct consideration in the selection of equipment in existing buildings. The primary considerations are maintainability, lifetime, performance (will it meet the performance needs of the application), safety, availability, and price. In many situations, a replacement needs to be made relatively quickly. Facility staff do not often have the time to seek out new information and analyze different options. Energy efficiency is considered to the extent the existing equipment was efficient (they often try to replace existing equipment with similar equipment), or if they have developed a standard to only buy a certain type of product. The standard may include energy efficiency, although that is likely not the only reason the standard exists.

Office Equipment

Energy consuming office equipment includes computers, copiers, printers, fax machines, and combinations of this equipment. This research project focused primarily on computers and copiers.

Personal computers are generally purchased by individual bureaus and they conform to the standards set by the information technology group for each particular bureau. The City does not have an annual supply contract for computers. Computers are bought as needed and the purchase must conform to the purchasing guidelines for the value of the purchase (purchases over \$5,000 go through the Bureau of Purchases and quotes are

obtained). They will refer to the State of Oregon contract for computers to check prices, but the City is often able to get better prices on their own.

The Printing and Distribution Offices (part of the Bureau of General Services) provides 350 to 375 copiers to City bureaus and Multnomah County. Printing and Distribution purchases the copiers and provides them to City offices that pay an inception fee to join the program and a monthly fee based on use.

Printing and Distribution purchases copiers from the state of Washington or Oregon contracts. In the past they wrote up specifications for copiers and put them out to bid. They no longer do this. They have found they can get better prices on the equipment through the state contracts.

The factors they consider in the purchase decision are (1) user friendliness; (2) reliability; and (3) customer needs. Most purchases are replacement of like machines. History with a particular brand of copier is important. They have had good luck with a particular brand of copier, so they stick with that brand. They are able to purchase this brand from the state contract. Note that this purchase meets competitive purchasing requirements because the state contracts were established through a competitive process.

Energy efficiency is not a factor in the purchase decision for copiers. They are aware of the Energy Star label, but do not seek it out. They assume that the copiers they are buying meet Energy Star requirements. They would not consider energy efficiency unless their customers asked. Their customers are not asking.

Printing and Distribution staff recognize that the sleep mode on copiers is an energy saving feature and they do explain this to their customers. If their customers request it, they will increase the idle time for sleep mode to begin from the preset value of 30 to 60 minutes to two hours.

Printing and Distribution recently purchased 73 digital copiers to replace older analog machines. Digital copiers are the wave of the future. These machines are multi-function. They can act as copiers, printers, fax machines and scanners. These machines offer significant operational cost savings, particularly when they operate as printers. Printing and Distribution believes digital copiers offer a number of benefits to their customers and thus sees the purchase of the 73 digital copiers as a good business investment.

From an energy standpoint, digital copiers are much more efficient than analog copiers. They also switch between sleep mode and active mode as quickly as a computer, making them much more convenient to use.

The City of Portland has made a significant investment in the trend to digital copiers. These copiers will provide significant benefits to the City, including energy savings.

Utility Systems

The Bureau of Water Works and the Bureau of Environmental Services manage the utility system that provides water to Portland and treats wastewater. This utility system utilizes motors to drive pumps that move water and wastewater and that drive the processing equipment that treats wastewater.

Both the Bureau of Water Works and the Bureau of Environmental Services consider energy efficiency when they make motor purchases by buying motors that meet NEMA energy efficiency standards. In the Bureau of Water Works, the specification of energy efficient motors is based on an informal mandate from the chief engineer. In the Bureau of Environmental Services there is a set of guidelines that specify energy efficient motors (these guidelines are voluntary).

At the wastewater treatment plant, when they need to replace an existing piece of equipment (like a motor), plant staff consider how critical the piece of equipment is and how long they can be without it. If it failed, they ask if they should change the installation. If there is time, they try to update to a better, more up-to-date product. They routinely look to upgrading motors.

When a motor fails, the easiest solution was to just rewind the motor. At the wastewater treatment plant, maintenance staff use the Motormaster program to determine when it is more cost-effective to replace the motor with a more energy efficient model rather than doing a motor rewind. With Motormaster, the repairperson can pull up the plant motor inventory, pick the failed motor, and Motormaster determines if it is more cost effective to replace the motor. It provides specific brands and model numbers for a suitable replacement. Plant staff can use this information to call supply houses and check on motor availability. The result is that motor replacements have become easier and more common.

IV. Planning Cycle/Timing of Decisions

The planning cycle and timing of purchasing decisions varies significantly between new construction projects and purchases for existing buildings. Planning cycles for new construction can take place over many years with multiple decision points involving a variety of players. At the other extreme is the replacement of a failed system in an existing building where a purchase decision may be made in a matter of hours. These purchase decisions are not generally isolated, one-time decisions, but usually are influenced by decisions made by others at various points in time.

This subsection discusses the variation in the planning cycle and timing of purchasing decisions for new construction, existing facilities, and office equipment.

New Construction

The planning and development process for a new building often takes many years. The first step is identification of the need for additional space and the decision to construct a

new building. A budget is established for an initial planning stage where the vision and specific requirements for the building are established. Next, a budget for building design is created and a professional design team is hired to begin designing the facility. At the City of Portland a project manager is assigned to the project and works closely with the design team. During the design phase, the characteristics of the building systems are established. These decisions have a significant influence on the products that are installed in the building.

Once the design is complete a construction package is prepared and the project is put out to bid by the Bureau of Purchasing. The winning contractor is responsible for constructing the building according to the requirements in the building design. During the construction process change orders, redesign, or value engineering can all result in building products being selected and installed that are different than those originally specified in the building design. These decisions often need to be made fairly quickly and they ultimately determine what gets installed in the building. The City project manager is involved in these decisions.

The City of Portland typically uses this “design-bid” approach for new construction projects. There are alternative approaches, such as “design-build” which are intended to speed up the construction process. These alternative processes generally give more autonomy to the contractor for selecting the various products that go into the building, although the building owner can set clear and specific performance standards that the contractor must meet.

For small construction projects, City engineering staff may do the project design (this is particularly true of utility system projects). The timelines for these projects can be relatively short (on the order of months) compared to large projects. The decisions made by engineering staff during design significantly influence what products are ultimately installed for these projects.

Existing Facilities

The timeline for making decisions for product purchases in existing facilities depends on the situation. If a critical piece of equipment has failed, City facility staff will make a decision very quickly. If the failed equipment is not critical, then more time may be available to consider alternatives. In either case, decisions are made relatively quickly and it is likely that the replacement equipment will be similar to the original equipment. The exception to this is when a piece of equipment fails prematurely, in which case the need for redesign or a different type of product will be considered.

It is important to recognize that these often very rapid decisions can be influenced by other decisions that were made over much longer time frames. For example the decision and development of a standard for a particular product occurs over a period of time and has a significant influence over the selection of certain replacement products for existing buildings.

In situations where a piece of equipment is being upgraded or is being replaced to avoid failure or improve performance more time is spent identifying the appropriate replacement product. This may involve some engineering design or analysis. For large upgrade projects, a project budget may be specifically established for the project as part of the budget planning cycle. In this case, the decision making process is similar to a small construction project.

Office Products

The purchase of office equipment is often planned in order to increase or maintain City staff performance levels. Decisions identifying the need for the purchase of this equipment are usually made over a period of time. Budgets are usually created for these purchases in the budget planning cycle. However, the decision for which product is purchased is usually made over a relatively short period of time.

V. Standard Inputs/Information Sources

There are many actors involved in the purchasing process. The standard inputs and information sources used by these actors vary depending on who they are and the function they serve. It is important to recognize that one information source will not reach every actor. Many actors rely heavily on their peers and on the network of relationships they have established for information.

This subsection discusses some of the sources of input and information used by purchasing officials, facility staff, and project engineers and managers.

Procurement Officials

Purchasing professionals do tend to be involved with their peers. They exchange information on specifications for various products and on things they are doing to improve the efficiency of purchasing in their organizations. They go to conferences and exchange ideas. The associations they are part of include the National Institute of Government Purchasers (NIGP) and the National Contracts Management Association (Federal, state, and local government contractors with more of a Federal slant). Some of the buyers with the City of Portland are active with the local chapter of NIGP (the Columbia Chapter) and with the Oregon Public Purchasing Association.

They do use the Internet as a source of information, although the level of use varies among the buyers at the City of Portland. NIGP has a web site that provides information such as specifications. The Thomas Register, which is a comprehensive source for products, is available on the Internet. The Columbia Chapter of NIGP has a web site that includes products available on cooperative purchasing contracts that can be used by governments that have paid to use these contracts. Likewise, the state of Oregon and Washington purchasing contracts are available on the Internet.

The City buyers are following progress on E-commerce, but it is not something they are actively pursuing. The Bureau of Purchases has a web site that provides contacts and information on open bids. They are discussing using the web more extensively to

provide specifications and more details on open bids, but there are size and capacity issues.

Facility Staff

Facility staff rely on two primary sources for information on the products they purchase - catalogs and by talking with their peers and vendors. They frequently use catalogs to find out about available products to meet their needs. The W.W. Grainger catalog was mentioned specifically by several City staff interviewed.

This group of people likes to get information by “just talking to people in the business.” They rely on local vendors for information, particularly staff at local supply houses they have developed a relationship with. The experience of City operations staff with the performance of existing equipment is another important input.

The local utility was mentioned as a good source for information, particularly in regard to lighting products. The utility is a neutral source of information. City facility staff have used the local lighting laboratory to see various lights in action.

They do rely on manufacturers, vendors, and sales representatives for specific information on products. This performance information is useful for developing specifications or identifying products that meet their specific needs.

Periodicals were not a common source of information mentioned by this group, although some do a lot of reading. Likewise, this group did not mention peer associations as a common source of information (one facility manager belongs to the International Facility Managers Association).

The Internet is used as a tool by some facility staff to get specific product information, although they do not tend to use it heavily. One individual noted they do not use the Internet as well as they should. Another indicated the Internet was not extremely helpful because it mostly is just a reconstruction of what is in catalogs.

Project Engineers/Managers

Project engineers rely on applicable codes and on professional engineering standards as key sources of information for developing the designs and performance specifications for building and utility systems. Professional societies are common sources for this type of information.

Professional staff such as engineers or project managers are more likely to be involved in an association (an engineer in the Water Bureau mentioned the American Waterworks Association).

Sources such as the Construction Specification Institute or MasterSpec provide detailed specifications that can be used to develop building specifications

Guidelines/Standards

Both facility staff and project engineers/managers rely on internal guidelines and standards as important sources of information. The wastewater treatment plant has a set of guidelines for a variety of electrical and control systems (including lighting and motors). The Parks Bureau has lighting standards. Informal standards also exist within other bureaus for energy efficient motors and for electronic ballasts.

VI. Personnel Involved

No one individual is the primary decision-maker in the purchasing process. A variety of individuals play roles in this process. The influence of each role on the purchase decision varies depending on the nature of the purchase.

There are a number of individuals at the City of Portland and external to the City that are involved in the purchasing process. In this section the roles of purchasing officials, design professionals, project managers, project engineers, facility staff, vendors/supply houses, manufacturers, and end-users are reviewed. Tables 3-5 in section B.VII below highlight some of these roles.

Purchasing Officials

A large part of what the buyer (in purchasing) does is guide the user through the purchasing process and help the user identify what they want. The buyer has flexibility in how they go through the purchasing process to best meet the user's needs and get them a product that meets their requirements. Some of the roles of buyers are to review purchase requisitions and specifications, solicit bids, select a vendor, issue a purchase order, and conduct formal bids.

Design Professionals

Bureaus hire design professionals to develop designs for new construction projects and major renovation or repair projects. These professionals, working with City staff, establish the specifications for the equipment in these projects.

Project Managers

Project managers employed by the City (for example there is a project management division in the Bureau of General Services) manage new construction projects for the City. They work with the design professionals on developing the project design and specifications to meet the needs of the City and they work with the construction contractor to ensure the project meets the requirements of the project design. The project manager is the interface between City staff and the project design and construction team.

Project Engineers

Project engineers employed by the City develop the designs and specifications for some facility construction and renovation projects. This is most common for utility system projects and projects that are not large or complicated.

Facility Staff

Facility staff play the primary role in selecting the equipment to replace existing building systems. For new construction projects or major renovations, facility staff play an input and review role. They provide input to project designers on what products they believe will be most reliable and easiest to maintain based on their operating experience. They also review the designs produced by engineers for compliance with bureau standards and for any maintenance issues.

Vendors/Supply Houses

Vendors and supply houses play an important role in assisting City staff with identifying specific products that meet their needs, determining availability of products, obtaining product performance information, and collecting price information on different products.

Manufacturers/Sales Representatives

Manufacturers and sales representatives provide staff with information on new products that they have available and with performance information on their specific products.

End-Users

City staff that occupy City buildings have limited influence on building systems that are selected for the buildings. End-users may be involved in identifying the needs for a particular building product and the comfort requirements that need to be provided. For new construction, there may be an advisory group of end-users that provides input into the design process on their needs and preferences for the new building.

End-users are often more involved in the selection of office equipment. In some cases, they may purchase this equipment directly. In the case of copiers, the end-users work directly with Printing and Distribution to select a copier.

VII. Sign-off Responsibility and Thresholds

The City of Portland Purchasing Manual specifies the purchasing procedures and responsibilities for different purchasing amount thresholds. As the thresholds increase, the procedures become more detailed and sign-off responsibility moves up to higher levels in the organization. The purchase of many energy consuming products in existing facilities falls within the lowest threshold level and the purchase of specific products for new facilities do not fall within these procedures.

This section reviews the purchasing procedures as specified in the City of Portland Purchasing Manual for limited purchase orders, purchase requisitions/purchase orders, and for formal purchases.

Limited Purchase Order

Purchases that are \$5,000 or less must meet limited purchase order procedures (Table 3). This type of purchasing process is commonly used for the purchase of energy consuming equipment in existing facilities. City employees purchasing products have a

great deal of responsibility and autonomy in this purchasing process. They are responsible for obtaining signature approval from the appropriation head in their unit

Table 3. Limited Purchase Order Procedures

Responsibility	Action
Employee	1. Obtains approval signature on limited purchase order from the Appropriation Unit head or his designated representative before going to the vendor
Employee	2. Must complete and sign the limited purchase order
Vendor	3. Whenever possible, the vendor should issue an invoice at time of purchase, indicating items purchased and their cost.
Employee	4. Forwards the appropriate copies of the form along with vendor invoice at time of purchase, indicating items purchased and their cost.
Accounts Payable	5. Pays only those invoices accompanied by copies of LPO.
Bureau of Purchases	6. Reviews IBIS accounting period reports to insure that purchases have been according to policy.

Note: This table is from the City of Portland Purchasing Manual, June 1994, page 4-8.

Purchase Requisition/Purchase Order

Purchases between \$5,000 and \$41,041 go through a purchase requisition/purchase order process (Table 4). Signature approvals rest within the requesting bureau. The signature approval unit signs the purchase requisition and forwards it to the Bureau of Purchases. The buyer reviews the purchase requisition for compliance and executes the requisition. Upon receiving the product, the requesting bureau signs the purchase order indicating if the purchase has been completed.

Formal Purchasing

Purchases over \$41,041 must go through a formal purchasing process (Table 5). In this case the bureau director must sign the transmittal letter that accompanies the bid specification package that is forwarded to purchasing. The Bureau of Purchases reviews the bid specification package for clarity and completeness and then carries out the bid process. Once the winning bidder is selected, the City Council must award the contract to the winning bidder by passing an ordinance. The City auditor obtains the contract signatures and the approval of the City Attorney. Finally, the Bureau of Purchases issues a purchase order and encumbers the necessary funds to pay the contract.

Table 4. Purchase Requisition/Purchase Order Procedures

Responsibility	Action
Requesting Bureau	1. Enter a purchase requisition into the electronic system and route to the appropriate signature approval unit within the Requesting Bureau.
Signature Approval Unit	2. Reviews and approves the purchase requisition. Electronically forwards the requisition to appropriate buyer in BOP.
Purchases & Stores	3. The buyer: (a) checks requisitions for completeness; (b) obtains competitive quotes by phone or in writing; (c) selects a vendor; (d) reviews requisitions for compliance with lease/rental, capital equipment, insurance, EEO and signature requirement for professional, technical or expert services; (e) prices the requisition; (f) creates and prints a purchase order. 4. Distributes the Purchase Order. Original copy is sent to the vendor. A copy is sent to the requesting bureau. The Purchasing copy is filed in the Purchasing Division.
Vendor	5. Delivers item to the requesting bureau and submits an invoice in duplicate to the Requesting Bureau.
Requesting Bureau	6. Inspects the delivered items to determine if the order is complete and correct. (a) If the order has been completed properly, the receiving person signs and dates a photocopy of the purchase order and checks the "Final Receiving" box to certify completion. This copy is forwarded to the designated person in the Requesting Bureau to enter the receiving into the system. (b) If the order is not complete the receiving person signs and dates a photocopy of the Purchase Order and checks the "Partial Receiving " box to indicate items received and sends this form to the designated system receiving person. Upon completion of the order, another photocopy of the Purchase Order is forwarded as in (a) above. (c) If the quality is not correct, or the quantity is not correct, it should not be accepted and BOP should be immediately advised.
Accounts Payable	7. Matches vendor invoice with purchasing and receiving documents in the system and reviews prices and extensions.
Computer Services	8. Generates warrants and reports based on the data received. Warrants and reports are forwarded to Accounts Payable.
Accounts Payable	9. Reviews warrants for accuracy and sends the original warrant and its corresponding documents to the City Auditor. Accounts Payable copies are forwarded to Data Entry for filing.
City Auditor	10. Sends warrants to vendors in payment of goods and/or services received.

Note: This table is from the City of Portland Purchasing Manual, June 1994, pages 4-11 to 4-13.

Table 5. Formal Purchasing Procedures

Responsibility	Action
Responsibility Unit	1. Prepares a bid specification package and submits it to the appropriation unit. (Bid specification package is described in the Purchasing Manual)
Appropriation Unit	2. Reviews the bid specification package for accuracy, completeness, clarity and budget authority and forwards it to the Commissioner-in-charge of the requesting bureau.
Bureau Director	3. Reviews the bid specification package, indicates approval by signing the Transmittal Letter, and forwards all documents to Purchasing.
Purchasing	4. Reviews the bid specification package for clarity and completeness. Makes certain that specifications do not unnecessarily limit competition. Reviews for objective basis of award, code compliance and omission/contradiction. Notifies bureau of specifications which need revision or justification. 5. Prepares advertisement and advertises for bids. 6. Receives, opens, tabulates and evaluates bids. 7. Prepare Report to Council recommending award of contract to the lowest responsible bidder. Advises bureau and provides chance to review bids. Sends Report to City Auditor for placement on the Council Calendar. 8. Sends copies of bid tabulation and Report to Council and to requesting bureau.
Responsibility Unit	9. Completes a system purchase requisition and electronically forwards it to Purchasing. 10. Prepares an ordinance to authorize contract with successful bidder. Sends ordinance to City Auditor.
City Auditor	11. Schedules the Report to Council and requesting bureau's ordinance for Council action. Report and ordinance must be received in Auditor's office by 10:00 a.m. Friday morning in order to be scheduled for Council action the following week.
City Council	12. Awards contract by accepting Report to Council and approving ordinance.
City Auditor	13. Notifies successful bidder and Purchasing of the award.
Purchasing	14. Prepares contract and delivers it to City Auditor.
City Auditor	15. Obtains contract signatures and approval of City Attorney and any required documents (insurance, performance bond, wage certification). NOTE: Successful bidder must return signed contract and required documents within 15 days. 16. Numbers the contract and distributes copies to Purchasing, requesting bureau and contractor.
Purchasing	17. After receiving numbered contract, processes requisition and completes a purchase order to encumber the necessary funds for payment of the contract.

Note: This table is from the City of Portland Purchasing Manual, June 1994, pages 5-26 to 5-27.

VIII. Financial Parameters

The specific procedures that apply for a particular purchase are determined by the purchase amount. Available budgets can constrain the purchase of energy efficient products. Factors such as high bids for new construction or emergency equipment failures can further constrain the purchase of energy efficient products. However, the City has successfully made investments in energy efficiency, both with and without utility rebates. City Energy Policy states the City should promote cost-effective energy efficiency improvements with paybacks of ten years or less. This policy is not aggressively promoted.

The procedures used for the purchase of products are determined by the purchase amount of the product as described in Section B.1 and Table 2. The purchase of products is also constrained by the amount of funding available for the purchase. The additional first cost of many energy efficient products is commonly identified as a barrier to the purchase of these products.

The funding available to purchase products is established within City budgets. Budgets for the purchase of products are usually set for general program areas rather than the purchase of a specific product. Thus there is flexibility in the amount of funding available to purchase a specific product.

For new construction, an overall budget for the project is established prior to the bidding of the project. After the contract is awarded a final construction budget for the project is established. The construction team strives to stay within this budget and tradeoffs and value engineering will occur throughout the construction process if necessary to stay within the project budget.

The incorporation of energy efficiency innovations in a project design can potentially drive up project bids to a greater degree than anticipated. In building markets with lots of work like Portland, builders are inclined to increase their bids significantly to cover the risks associated with approaches or technologies they are not familiar with. This can make innovations that initially appeared cost-effective to not be.

Local market conditions where there tends to be more work than contractors also can work against energy efficiency. Busy contractors produce high bids. High bids mean project costs need to be cut, likely leading to things like energy efficiency being eliminated.

For the maintenance and operation of existing buildings, budgets are established for general program areas. For the Bureau of General Services, which operates and maintains many City buildings, a maintenance and operation budget is established for each building and they strive to stay within that budget. The Bureau of General Services is not a General Fund agency. They are dependent on revenues earned from services they provide. In cases where this is an emergency and a large piece of equipment fails, requiring a large unanticipated expenditure, funds need to be found in

other budget areas. For emergency requests over \$41,041, the City Council must pass an ordinance authorizing the expenditure.

The City of Portland has successfully applied utility rebates to the completion of energy efficiency projects. These rebates played an important role in supporting the success of the City Energy Challenge Program. A total of \$424,000 for 26 energy efficiency projects was received. However, a similar number of energy efficiency projects were completed as part of the Energy Challenge without any rebates from the local utility.

The City of Portland Energy Policy states that the City will promote cost-effective energy savings in City-owned buildings. Cost effective is defined as a payback of ten years or less. This policy is not aggressively promoted.

The City of Portland has not tried energy service performance contracting or other alternative approaches for financing energy efficiency projects.

IX. Potential Efficiency Gains

The City of Portland has reduced annual energy costs by \$1 million by implementing a variety of energy efficiency projects as part of the City Energy Challenge Program. The City has not conducted a comprehensive analysis of the remaining energy savings potential in City facilities. We believe that a five-percent reduction in energy costs (\$500,000/year) is a reasonable target for an energy efficient procurement initiative.

The City of Portland launched a City Energy Challenge Program in 1990 to reduce annual energy costs by \$1.5 million by 2000. This goal represented a little more than a 15 percent reduction in annual energy costs. Through 1997 annual energy cost reductions have reached \$1.3 million dollars. Almost \$1 million of these savings were achieved through energy efficiency savings and a little more than \$300,000 was achieved through the use of experimental utility rate schedules.

Over half the energy efficiency savings were achieved by the Bureau of Environmental Services. The largest savings came from the installation of fine bubble aerators (savings of \$350,000/year) and variable frequency drives (savings of \$50,000/year) at the wastewater treatment plant in 1994 and 1997 respectively. Other large savings came from street lighting retrofits (savings of \$94,000) and building lighting retrofit projects in a variety of buildings.

There are an additional \$300,000 of annual savings identified as part of the City Energy Challenge Program. Some of these projects have been postponed and some will not be completed.

A comprehensive estimate of energy savings potential for all City facilities has not been conducted. Note that the dispersed nature of city government has resulted in some lack of consistency across government units for achieving efficiency gains. Even though the

City has done a great deal to improve the energy efficiency of its major energy consuming facilities, there is more that could be done.

The City is adding some new buildings including the "Development Building" and some new fire halls. These new buildings will increase overall City energy consumption, but also offer the potential for energy efficiency improvements.

The total annual energy bill for the City of Portland is almost \$10 million. Even a modest improvement in efficiency of 5 percent from the purchase of more energy efficient products would produce \$500,000/year in annual savings. We believe this is a reasonable target for a multi-year energy efficient product purchasing initiative.

X. Comments/Suggestions Regarding the Energy Star Purchasing Toolkit

City of Portland staff receiving the Energy Star Purchasing Toolkit for the most part had not taken the opportunity during the short duration of the project to apply any information from the Toolkit to the work they do. Most City staff deal with commercial type equipment and the standards and product listings for commercial type equipment (such as HVAC equipment) are not as detailed as for some of the residential Energy Star products. A purchasing official suggested that the most important consideration is getting the Toolkit into the hands of individuals that do a lot of purchasing of these types of products. Managers of the central stores for some of the bureaus may be key potential users.

Five Energy Star Purchasing Toolkits were provided to City of Portland staff at the end of this research project. We received limited input from several staff on the Toolkit, but most of the staff receiving the Toolkit had not had time to look at the Toolkit and apply it to their jobs during the short duration of this project.

One staff person in particular has been trying to use Energy Star standards for the equipment his bureau requests. This person views the Energy Star Toolkit as a guide and he has also gone to the Energy Star website to copy more specific product information. He used the Toolkit to identify standards and equipment meeting those standards for a residential style heating system renovation at a residential home used as a community center. He is hopeful they will accept his recommendations and install equipment meeting Energy Star standards.

However, most of the products and projects he is involved with are for commercial systems. He was not able to find standards or product listings for the commercial HVAC equipment he deals with. He indicated he needs more specific information on commercial products like those available for residential equipment. He wants to be able to go into a meeting with the project designers and be able to point and say this is what we want and these are the ratings we need. He needs documentation that justifies the use of this equipment.

Another individual said he found information in the Toolkit that he plans to use in the local newsletter to raise the awareness of staff about energy efficiency. Information on things like horizontal axis washing machines and compact fluorescent fixtures are things that staff can do at home. They bring these experiences back to work and this results in increased awareness and new ideas to increase facility energy efficiency.

However, at this point he has not been able to identify anything in the toolkit that they could use at the plant. Basically, for motors and lighting they are already purchasing energy efficient products and evaluating their options. They have the information they need.

A purchasing official noted that the challenge is getting the Toolkit into the right person's hands. This purchasing official is primarily involved in large construction projects and does not deal with purchases at the product level, so the Toolkit is not particularly useful for her. She noted that it might be most valuable for the managers of the stores departments at the bureaus. These individuals are involved with the purchase of a lot of products that are used regularly in City facilities.

Another individual said the most important thing that needs to be done is raising awareness. The communications materials with the Toolkit may be useful for this purpose.

C. Recommendations

The purchasing process at the City of Portland involves a number of different people in different bureaus purchasing a variety of products using a number of different methods. While there are clear guidelines that establish a framework for purchasing, users do have a variety of purchasing options. Many factors influence which products are ultimately specified and purchased. There is not a single individual making a purchase decision at a specific point in time.

Creating change within this somewhat complicated framework towards the purchase of energy efficient products is a challenge. Change will take time. Simple isolated strategies are not likely to be successful. It is not sufficient to simply provide more information or a better analysis tool.

Our research has identified some strategies that we believe will effectively encourage energy efficient purchasing at the City of Portland. These strategies are based on our understanding of purchasing at the City of Portland and the opportunities and needs we identified in our research.

We believe that some of the strategies identified for the City of Portland can be successfully applied at other organizations. We discuss our recommendations for similar organizations and the organizational characteristics that need to be considered. In addition, we suggest strategies that might be part of a broader purchasing initiative.

It is important to recognize that the strategies recommended work together. Any one strategy is unlikely to be successful in isolation of other supporting strategies. For example, awareness raising activities will not be successful unless the energy efficiency products are available, can be easily identified, and can be easily purchased.

I. Host Organization Recommendations

Our research suggests that there is a relatively strong environmental ethic within the City of Portland and that staff are aware of and have experience with energy efficient products. However, energy efficiency is not usually considered in most purchase decisions involving energy consuming products. We believe this is due in part to a lack of awareness of how energy efficient products deliver value to the City beyond just energy savings. Thus our first recommendation focuses on raising awareness about the value of energy efficient products.

Our second key recommendation is aimed at making it easy for City staff to purchase energy efficient products. Staff told us that they do not have a lot of time to seek out information on new products such as energy efficient products. There is a tendency to purchase products they are familiar with and that they can get easily through the standard purchasing channels. Staff need to know which energy efficient products they need to consider and they need to know how to easily identify and purchase these products.

Getting Out the Message – Awareness Raising Activities

This recommendation focuses on getting out the message about the value of energy efficient products. This will result in the recognition that energy efficient products respond to important City needs.

Goals:

1. Link energy efficiency to things of value
2. Link energy efficiency to environmental benefits
3. Raise awareness of the proper application of energy efficient products

Activities:

- ***Get the word out on the relevance of energy efficiency.*** According to City of Portland staff, the way to sell energy efficient products is to point out the real benefits - not just energy savings. Identify product benefits that are important besides energy such as safety, reliability, improved performance, better comfort, reduced maintenance, and other environmental factors. These are the benefits that make energy efficient products relevant.

It is important to personalize energy efficiency by identifying energy efficiency ideas that staff can do at home. Staff bring these ideas back to work and apply them in their jobs.

Mechanisms to get the word out include putting articles in city bureau newsletters and developing materials, presentations, and demonstrations that get the word out on the relevance of energy efficiency and the value of purchasing energy efficient products.

- ***Work with other environmental initiatives in the City.*** There are a number of environmental initiatives happening in the City. The opportunity to get environmental purchasing on the policy agenda through these environmental initiatives needs to be considered.

Energy efficiency needs to be identified as an effective way to practice environmental purchasing. Incorporating energy efficiency in broader environmental initiatives allows benefits to be leveraged and expands the political base supporting energy efficiency. Within a broader framework of environmental initiatives, the potential for change increases.

- ***Develop forums to exchange knowledge and experience with products among City staff.*** One of the positive benefits of forming the advisory group for this project was the opportunity for City staff to share their experiences. City staff have a lot of good knowledge and experience to share about products they have used, proper maintenance procedures, how to specify certain equipment, and what guidelines and standards they use. However, due to the decentralized nature of City government, much of this knowledge is not shared.

City staff are one of the best resources for raising awareness about the value and application of energy efficiency products. Providing mechanisms for sharing this experience and documenting this knowledge for use by other City staff is an effective strategy for getting the word out on energy efficient products.

The City Energy Office is positioned to coordinate getting the word out about energy efficient purchasing. City staff have the expectation that this is the type of activity the Energy Office does. Links need to be made with environmental initiatives in the City, some of which the Energy Office is already involved with. The Bureau of Purchases and the City Council need to be involved in developing policy on environmental purchasing. The Energy Office can utilize and further develop its network of relationships to provide an opportunity for staff to share their experiences.

Encouraging the Purchase of Energy Efficient Products

This recommendation focuses on making it as easy as possible for City staff to consider and purchase energy efficient products. The result should be the identification of specific energy efficient products to consider along with supporting information, documentation, and standards for making these purchases.

Goals:

1. Identify specific energy efficient products that deliver value to the City
2. Get product information about these products to users throughout the City
3. Support the purchase of these energy efficient products

Activities:

- **Analyze the benefits of various energy efficient products and identify those specific products that deliver value.** Collect the existing City experience with energy efficient products and document the benefits from those products. Identify additional energy efficient products that might benefit the City, conduct life cycle cost analysis, collect performance information, and determine which products the City would benefit from.

The result of this activity would be a specific list of product types (such as LED exit signs) where the purchase of energy efficient products is clearly justified on a life cycle cost basis. This effort should initially focus on those products already being successfully used by some bureaus.

- **Provide information and support to make it easy to buy energy efficient products.** For those products where the purchase of energy efficient products is clearly justified, develop lists of energy efficient products and specific brands and models that the City has had good experience with. For other energy efficient products that would benefit the City, identify specific brands and model numbers that meet the necessary performance requirements.

Identify where and how to buy these products and work with vendors to make these products available. Develop performance language and specifications that can be used or given to designers or vendors.

- ***Develop energy efficiency standards or guidelines for specific products.*** Since energy efficiency is not often considered in purchase decisions, some form of standard can be an effective way to ensure that beneficial energy efficient products are considered. Energy Star performance requirements, as well as the experience of staff with energy efficient products provide a good basis for developing standards or guidelines. These standards can take the form of informal guidelines or recommendations or they can be more formal. Standards or guidelines should be developed for those energy efficient products identified in the previous activities that benefit the City.

Standards and guidelines provide other benefits to the City besides energy efficiency. They can result in more consistency in products and operating procedures, which reduces maintenance and operation costs. In some cases the City may be able to standardize on specific energy efficient products.

The Energy Office should work closely with City staff to identify and analyze energy efficient products. Existing experience and guidelines need to be collected and documented. The Bureau of Purchases needs to identify appropriate mechanisms for making energy efficient products available for purchase. City staff are responsible for developing product standards and guidelines. The Energy Office can be a resource in this effort.

Note that resources for the Energy Office or others to carry out these activities are not specifically allocated. Funding would need to be identified for this work.

II. Other Similar Organizations

We believe that the strategies suggested for the City of Portland are relevant for similar organizations. It is our experience that energy efficiency is not commonly considered in the purchasing decisions at most organizations. Raising awareness about the value and relevance of energy efficient products is one mechanism for responding to this need.

Likewise, staff in other organizations experience the same obstacles to purchasing energy efficient products as those at the City of Portland. Staff need to know which energy efficient products they need to consider and they need to know how to easily identify and purchase these products.

However, the City of Portland is further along the learning curve towards environmental purchasing as a result of its strong environmental ethic, its experience with energy efficiency, and the presence of a City Energy Office.

When generalizing the City of Portland results to other organizations, we believe it is important to consider the following factors.

1. Organization size
2. Organization form
3. Policy-level support for environmental initiatives and energy efficiency
4. Managerial-level support for environmental initiatives and energy efficiency
5. Context for environmentalism in the surrounding community (how prevalent are "green" sentiments in the surrounding community--this influences both the political will and the motivations of actors within the organization)
6. Centralization of the purchasing function
7. Existence of an energy office or similar group (e.g., sustainability czar or environmental policy agency) with appropriate organizational mandate and resources to promote and support efforts across agencies

The City of Portland is a relatively large organization with a very unusual form of government. There is strong support for the environment at a policy-level and within the community and this is reflected at the managerial level. Portland has a central purchasing agency and a well-established Energy Office. The Energy Office provides a convenient focal point for an energy efficient purchasing initiative, but it is an uncommon feature in most public organizations.

We suspect that most organizations would need to lay some groundwork to reach the level the City of Portland is currently at. This would include assessing and developing support for environmental and energy efficiency initiatives, developing experience with energy efficiency products through demonstrations, and identifying responsibility for the energy management function in the organization. Unique opportunities where energy efficiency can meet an important need or solve a problem need to be identified.

III. Purchasing Initiative - Procurement Tools with Broad Application and Benefit

Our research has shown that individuals and organizations external to the City of Portland have significant influence on the products purchased by City staff. These individuals and organizations include peer associations, vendors, manufacturers, utilities, and design professionals. These groups influence purchases through the relationships they have with City staff, the information they provide, the products they develop and make available, the programs they offer, and the specifications they develop.

In addition to efforts internal to organizations, a broader purchasing initiative is necessary to address the external groups that influence purchasing. This section discusses strategies for encouraging and supporting energy efficient purchasing that are external to the host organization.

It is important to recognize that this research project focused only on one organization. Thus it has limited ability to identify initiatives that would apply to many organizations. However, we do believe our experience at the City of Portland gives us insights on some broader purchasing initiatives that are necessary to support energy efficient purchasing in organizations like the City of Portland.

We suggest the following goals for a broad purchasing initiative.

- Make products easily available for purchase by public organizations through their normal purchasing channels
- Make people aware of product performance
- Develop purchasing networks and a critical mass of environmental purchasers

Energy Efficient Products are Easily Available

This initiative focuses on making sure energy efficient products can be easily identified and purchased by public organizations through their normal purchasing channels.

Goals:

1. Make energy efficient products available through major local supply houses in major markets.
2. Make energy efficient products available through major catalog and retail vendors.
3. Make energy efficient products available through cooperative purchasing contracts.
4. Work with manufacturers to develop energy efficient products that meet public organization needs.

City staff tend to go to their typical sources to purchase products. If those sources do not provide or otherwise identify energy efficient products it is unlikely an energy efficient product will be purchased.

Energy efficient products need to be offered to public organizations through the normal supply paths that they use. Initiatives need to ultimately develop and use existing supply mechanisms. Critical to the effort of developing these supply paths is demonstrating to suppliers that a demand exists for these products. The effort to develop supply paths goes hand and hand with efforts to develop a critical mass of environmental purchasers.

One potential strategy for developing good supply paths is to have groups of public organizations conduct cooperative bids for energy efficient products. This serves both to create a significant demand for these products as well as creating competition that may lead to better prices for these products.

Information on Product Performance is Readily Available

The purpose of this initiative is to make sure that complete performance information (including relevant information besides energy efficiency) for energy efficient products is readily available in a form that is useful for users in public organizations.

Goals:

1. Make sure that performance information is available that highlights the advantages of energy efficient products in addition to energy efficiency.
2. Make sure that purchasers do not have to go to several sources to get the performance information they need about energy efficient products.
3. Make sure that energy efficient product performance information is available from reliable and trusted sources.

City staff are most interested in product performance information related to application needs, maintainability, and safety. These are the factors that will sell the product. Energy efficiency is usually of secondary importance. The performance characteristics of energy efficient products in these areas need to be emphasized and readily available.

City staff rely on trusted sources for product information and recommendations. These sources need to have access to energy efficient product information. Many of these sources, such as vendors and supply houses have little interest in energy efficiency information unless their customers are asking for it (which they are not).

Some form of electronic media seems most appropriate for meeting the goals of this objective. Activities might focus on the most appropriate means for doing this and if there are existing mechanisms that could be used.

Develop a Critical Mass of Environmental Purchasers

This initiative focuses on developing purchasing networks to build the demand for environmentally efficient products. This is perhaps the most critical element for ensuring that these products are readily available.

Goals:

1. Link energy efficient purchasing with broad environmental initiatives in public organizations.
2. Network within purchasing organizations to promote environmentally efficient purchasing.
3. Develop a network of environmentally efficient purchasers in public organizations.
4. Establish collaborative efforts to purchase environmentally efficient products.

There is evidence of environmental initiatives and efforts to purchase recycled content products in public organizations like the City of Portland. Purchasing organizations are interested in supporting these efforts if it is a service their clients demand.

Our experience at the City of Portland suggests that champions for environmental purchasing can be somewhat isolated. Creating networks of these champions between organizations is one way to overcome this isolation and to promote the exchange of

ideas and strategies between organizations. Ultimately this can lead to collaborative efforts that leverage the resources of several organizations.

Activities need to network among these organizations and identify the most effective ways to build these networks and establish collaborative purchasing efforts.

D. Implementation Plan

The City of Portland Energy Office drafted an Implementation Plan for Energy Efficient Purchasing. This plan identifies strategies that lead to the proposed goal of buying energy consuming equipment that is rated in the top 25% in terms of energy efficiency for a particular product category.

The plan focuses on addressing three common obstacles to the purchase of energy efficient products at the City of Portland.

1. Lack of information on how to identify and recognize the value of an energy efficient product. The plan addresses ways to link information resources with the buyer/specifier.
2. An emphasis on first cost and an inability to account for the long-term value of energy efficient products. The plan identifies some strategies to provide tools and support to address the first cost barrier.
3. There is a lack of a clear directive that is regularly communicated to City staff regarding the value to the City of energy efficiency, even though the City Energy Policy directs the City to make these purchases.

The implementation plan identifies action steps to overcome these obstacles for three types of purchases:

1. Purchases up to \$5,000 that are purchased using a limited purchase order or credit card that are executed at the bureau level. Bureau staff are often supportive of energy efficiency, but have concerns about unfamiliar technologies and impacts on day-to-day maintenance and performance.
2. Purchases over \$5,000 that utilize a purchase requisition, annual supply contract, cooperative purchasing contract, or formal bid. The Bureau of Purchases is involved in these purchases. Buyers (in purchasing) do not specify products, but do have the opportunity to offer guidance and provide support for the purchase of energy efficient products.
3. Purchases for construction projects occur under the supervision and influence of City project managers. Energy using products for these projects are purchased outside of the City's purchasing process. The City project manager is the key liaison between the City and construction contractor with responsibility for budget, performance, and timelines.

Information Barrier Strategies

A central element of these strategies is to clearly establish a City preference for high-efficiency products by adopting "Energy Star or equal" as the standard product requirement when purchasing energy consuming products. This would be implemented by

- adding energy-related instructions on LPO's,
- including Energy Star Guidelines in the Purchasing Manual,

- integrating the City preference for high-efficiency products into purchasing documents such as bid documents and vendor instructions,
- developing standard language for requests for qualifications and proposals that direct engineers and architects to specify high-efficiency equipment, and
- integrating energy efficient purchasing language into the boilerplate sections of city construction standards.

In addition, targeted training and information resources are suggested to better inform staff. A sustainability roundtable is proposed to discuss specifications, product performance, purchasing opportunities, successes and problems. Vendors will be contacted with information about the City's preference for energy efficient products and will be encouraged to respond with product lists and performance information. When possible, the City will take advantage of utility, state, and Federal programs that support energy efficiency.

First Cost Strategies

The central element of the first cost strategies is to authorize and direct that purchasing decisions be based on life cycle cost principles rather than first cost alone. Bid document language will be developed for energy efficient products. Lists of energy efficient products will be developed to make purchasing easier. Vendors will be encouraged to support City staff with life cycle cost analysis. The plan proposes that the City develop a policy that requires construction budgets to include a dedicated set-aside to fund energy design, efficient products and other green building designs that support sustainable principles and exceed code.

Clear Direction from Management Strategies

An important first step is a citywide statement of value or commitment from bureau management that communicates support for decisions to buy high-efficiency products. Individual meetings need to be held with City Commissioners, key bureau managers, and the new director of the Bureau of Purchases. Purchasing energy efficient products can be addressed as part of the implementation of the Building a Greener Portland Initiative. For construction projects, there need to be high level directives communicated at the beginning of the project that specify the incorporation of energy efficient design and Energy Star rated products.

Next Steps

The City Energy Office will take the lead on refining and developing support for the implementation plan. The draft plan will be reviewed by the Bureau of Purchasing and other key staff and any necessary revisions will be made. It will be presented to the Sustainable Portland Commission to be included in the City's sustainability initiatives. Ideally, it is hoped the plan will be incorporated into the Building a Greener Portland Study that is now underway.

E. Results

The purpose of this project was to conduct a pilot study at the City of Portland to assess existing procurement processes and identify and recommend enhancements for encouraging energy efficient purchasing. The primary result of this effort is the Draft City of Portland Implementation Plan for energy efficient purchasing. This plan is a solid starting point for encouraging energy efficient purchasing at the City of Portland.

We believe that the strong environmental orientation and the existing environmental initiatives within City government provide a positive framework for developing a successful initiative to encourage energy efficient purchasing. The Building a Greener Portland study provides a unique opportunity for energy efficient purchasing to contribute to improving environmental practices in the City. There are plans to rewrite the City purchasing guidelines. This provides an opportunity to incorporate guidelines that encourage the purchase of resource efficient products.

The formation of the advisory group for this project provided some near term benefits. Staff were able to share some of their experiences with different products. Staff became more aware of what their counterparts in other bureaus were doing. Several staff exchanged guidelines and standards they had developed for their particular bureau.

The assessment of purchasing at the City of Portland increased the understanding of purchasing in the City by the project participants. This helped to identify opportunities to encourage the purchase of energy efficient products and supported the development of the implementation plan. In addition, insights were gained which can be used to develop effective strategies for a broader procurement initiative beyond the City of Portland.

It is our expectation that the purchase of energy efficient products will become one important element in the efforts by the City of Portland to improve environmental practices. By developing more consistent purchasing practices which encourage the purchase of high quality, efficient products, the City will benefit at a number of levels. We believe a reasonable energy saving target for an energy efficient purchasing initiative is \$500,000/year for the City of Portland. However, the benefits of the initiative will go well beyond energy savings.

Appendix A.

**Purchasing Energy Efficient Products
Draft Implementation Plan for the
City of Portland**

April 29, 1999

City of Portland Energy Office

I. Introduction

Saving energy is good public policy.

Local government has a great opportunity to save energy and reduce electric and natural gas bills by choosing to buy high-efficiency equipment for publicly owned facilities. The added cost of the equipment is modest (sometimes zero) but the savings are potentially huge. Return on investment ranges from 5 to 50 times the extra cost to buy high efficiency. Performance, maintenance and equipment-life equal or exceed that of standard efficiency products. Other benefits go beyond just saving energy. Air pollution is reduced as less fossil fuel is burned, and with some products indoor air quality is improved. Employee productivity is often enhanced. In short, investing in energy efficiency is a visible demonstration of our city's commitment to responsible government that values the environment and reduces costs.

II. Barriers to Purchasing Energy Efficient Products.

This implementation plan recognizes three leading barriers within our municipal operations. First is the lack of information. What defines efficiency for a given product? Some buyers aren't aware that most major name brands have high efficiency models as well as basic efficiency ones. Are they available? What are the savings potential? And what is the life-cycle cost of the efficient product versus the standard efficiency product? The basic resources are already available to help answer these key information questions. This plan will address ways to link information resources with the buyer/specifier.

Second is the first cost barrier. This barrier is easier understood by distinguishing between the initial purchase price of equipment (first cost) and the lifetime cost of owning and operating equipment. When the true cost of owning the equipment is analyzed – including the purchase price, energy bills and maintenance over the expected life of that product – the energy-efficient model usually outpaces the value of the standard product by a wide margin. Easy to use tools are available in print, on disk and on the web to assist product specifiers in analyzing a products total life cycle cost.

The third barrier is the lack of a clear directive. The 1990 City Energy Policy directs the city to make efficiency investments. Sometimes, however, the decision to buy a highly profitable energy product is overlooked because this priority isn't clearly and regularly communicated to the staff or consultants specifying the products. This plan proposes some first steps to overcome this barrier.

III. Three General Points for Purchasing.

This implementation plan categorizes city purchases into three areas of job related responsibility. The first grouping is field staff who use Local Purchase Orders (LPO's), Procurement Card or a similar billing procedure with the authorization of their supervisor. The product is chosen by the end user, has a cost of less that \$5,000 and requires supervisor approval. In addition, several bureaus (Parks, Maintenance, Water, and Environmental Services) maintain central storerooms that stock frequently used

products. Storekeeper's stock products requested by field staff. Because of the \$5,000 threshold, much of the energy consuming equipment used in city-owned facilities is purchased at this level. Examples of products include motors, pumps, lighting fixtures, lamps, ballasts, exit lights, energy management controls, computers, copiers, fax machines, and some heating and cooling equipment.

A second point for purchases is through the Bureau of Purchases and Stores. Products purchased cost greater than \$5,000 cover a wide range of products, including annual supply contracts for many goods. Here, the end-user determines what product is needed, then sends a Purchase Requisition Form to the Bureau of Purchases who solicits competitive bids from private sector vendors. The level of detail used to specify a particular product ranges widely, from very general to precise specification of brand and model. Examples of energy products purchased include larger quantities of lighting products, larger pumps and motors, variable frequency drives, energy management systems, mainframe computers, large copiers, and heating and cooling equipment like heat pumps, gas boilers and rooftop HVAC.

The third point of product specification falls under the supervision and influence of city Project Managers who oversee complicated construction projects. They frequently have responsibility for all phases of the project -- from design, through construction, to final inspection. Here energy using products will be specified by a professional engineer or architect from within the city bureau, or an outside architect team hired to design the facility, or by the general contractor under a design-build agreement. Often the energy using products are parts of complicated, interactive systems like a series of pumps and motors to lift water, or whole buildings with many related systems including heating, cooling, ventilation, air quality, fire suppression, lights, system controls and plug loads like computers and office equipment.

IV. Implementation Plan.

The following implementation plan suggests action items within each of the three categories of purchaser described above and for the three general categories of barriers previously described. This is a draft plan, and as such will undergo multiple reviews and edits by purchasers and managers of many bureaus. In order to keep the plan brief and to allow for changes, we have chosen the outline format that follows.

Purchasing Goal: To buy only energy using equipment rated in the top 25 percent of ratings for energy consumption. When applicable, the US EPA's Energy Star labeling criteria or ratings will define eligible brands and models.

Field Staff and Storeroom Purchases

General. Portland's Energy Policy for city-owned buildings states that the city will promote cost-effective energy savings actions with paybacks of ten years or less. This policy is generally known but isn't promoted aggressively.

Field employees are frequently supportive of energy efficiency strategies because they intuitively agree with the energy cost reduction and maintenance savings benefits. If

there is resistance to efficient products, it is related to concerns about unfamiliar technology, the impacts on day to day maintenance and/or performance.

A. Clear Direction from Management Strategies

Strategies.

1. A statement of value or commitment from bureau management or a citywide statement that communicates support for decisions to buy high-efficiency products would be a powerful first step. Purchasing energy consuming products can be addressed at the same time that the Building a Greener Portland Initiative is implemented. Responsibility: City Council, Sustainable Portland Commission and/or the upper management of individual Bureaus. Then communicated to field staff by their supervisors.
2. Individual meetings with City Commissioners and key bureau facility to emphasize energy efficiency's importance and Council's past commitment. Sustainability issues can be addressed as well

B. Information Barriers

Strategies.

1. Adopt "Energy Star or equal" as the standard product requirement when purchasing energy consuming products.
2. Communicate the value statement or commitment to buy premium efficiency products through bureau newsletters, at employee meetings, through supervisor's directives and printed material posted in workspaces. Responsibility: Individual Bureau, supported by Energy and Purchasing.
3. Offer training and energy related presentations to field and stores staff.
 - Target storekeepers
 - Target selected maintenance personnel who maintain energy using equipment
 - Electricians
 - HVAC technicians
 - Pump station maintenance technicians
 - Building Mechanics
4. Assemble and distribute information on resources available.
 - Energy Star web site.
 - Energy Star Purchasing tool kit.
 - Energy Office staff availability.
 - Product information. Performance, non-energy benefits, availability
5. Contact key local vendors and inform them of city's desire to buy energy star products only. Ask them to help respond to product requests with products on the Energy Star list. Encourage them to offer life cycle cost analysis services when city staff research competing brands, model and their price.

6. Initiate a Sustainability Roundtable. Organize a quarterly round table to discuss specifications, product performance, purchasing opportunities, successes and problems. Under the theme of sustainability discussions would cover other “green” topics including air quality, recycled content products, toxics and alternatives, waste reduction, vehicle use and more. Use the roundtable to discuss the development and use of standards for purchasing products.
7. Add energy-related instructions on LPO’s. A written instruction, logo, or question, etc. on LPO’s would remind the field staff that they should buy efficient products. This could be an asset to staff who infrequently buys energy products. The instructions could also include a reminder to buy earth friendly products.

C. First Cost Barrier

General. Since city field staff is generally making purchases below \$5,000, buying less costly standard efficient equipment takes place because it’s common practice, not due to the lack of funds. Our challenge is to shift the way staff approach the purchase, giving them the authorization and encouraging them to pay a slightly higher price when savings in operating cost and maintenance justify the price.

Strategies.

1. Authorize and direct that purchasing decisions be based on life cycle cost principles rather than cost alone. Include the expected life of the product, annual maintenance and energy cost with some level of consideration to green features or the lack of. Energy Office staff can provide technical assistance when needed.
2. Encourage facility managers to develop lists of standard products to be used in building maintenance. For example, set the standard that all replacement lighting fixtures shall be rated as Energy Star, or equal.
3. Identify the most frequently used vendors, and then communicate to them the city policy to buy only energy star or equivalent products when bids are solicited. Encourage them to support city staff with life cycle cost analysis if appropriate.

Bureau of Purchases -- Purchase Requisitions, Annual Supply Contracts and Group Purchasing Contracts

General. Staff within the Bureau of Purchases actively support making energy efficient purchases and have participated in the process to develop this action plan. As professional buyers, Bureau of Purchasing staff don’t specify products, rather they facilitate an open and fair purchasing process to get a product that meets the need at a competitive price. At times, buyers do have the opportunity to advise and guide staff from bureaus requesting the purchase. The following strategies are opportunities for this central bureau to help support energy efficient purchasing.

A. Clear Direction from Management

Strategies

1. The Bureau of Purchases has a new Director as of April 1998. We recommend a meeting with Susan Klobertanz to update her on current policies for energy and sustainability and the recent study of opportunities for purchasing energy products. This should include an invitation to participate in the Building a Greener Portland study.
2. Obtain commitment from the Purchasing Bureau to support energy efficient purchases and green building products.

B. Information Barrier

Strategies

1. Incorporate Energy Star purchasing guidelines into the Environmental and Energy section of the Purchasing Guidelines Manual. A revised edition is planned for 1999.
2. Integrate a city preference for high-efficiency products in purchasing into written documents from the Bureau of Purchases, like bid documents and boiler plate instructions to vendors.
3. Introduce city preference for high-efficiency products when buyers communicate with city staff and vendors. Consider developing a one-page handout for distribution by buyers.
4. Include energy and sustainable purchasing topics in trainings offered by the Bureau of Purchases to Project Managers and other city staff.

C. First Cost

Strategies

1. Adopt bid document language that directs bidders to propose energy consuming products that meet Energy Star labeling when ratings are available, or fall within the top 25 percent of available like products.

Project Manager Construction Projects

General. Construction Project Managers frequently shepherd major projects from conceptual design to start-up. Frequently outside architectural and engineering firms are employed to complete the design and thus specify the energy using equipment. When the project is bid out and constructed by the private sector, the project manager is the key liaison between the bureau and construction contractor with responsibility for budget, performance and timeline.

A. Clear Direction from Management

Strategies

1. The city's preference for energy efficient products must be communicated very early in design processes. Bureau management should direct architects and

engineers to incorporate energy efficient design and Energy Star rated products as required elements of the project.

B. Information Barrier

Strategies

1. Develop standard language for use in Requests for Qualifications (RFQ) and Requests for Proposals (RFP) that directs architects and engineers to specify efficient products in city projects.
2. Integrate energy efficient purchasing language into boilerplate sections of city construction standards.
3. Use design assistance programs offered by outside organizations like utilities, state and federal program. For example, Portland General Electric's Commercial Earth Smart Program.

C. First Cost

Strategies

1. Develop a city policy that requires construction budgets to include a dedicated set-aside to fund energy design, efficient products and other green building designs that support sustainable principles and exceed code. The fund could be as much as five percent of the budget and should remain protected from value engineering processes and budget reductions.
2. Promote sustainable building design and systems that lead to lower overall costs. For example, orientation and design to harvest natural daylight reducing the cost of the lighting system and the size of cooling equipment, potentially lowering the overall cost of construction.

V. Next Steps

The City Energy Office will take the lead on refining and developing support for the implementation plan. The draft plan will be reviewed by the Bureau of Purchasing and other key staff and any necessary revisions will be made. It will be presented to the Sustainable Portland Commission to be included in the City's sustainability initiatives. Ideally, it is hoped the plan will be incorporated into the Building a Greener Portland Study that is now underway. This study is exploring potential roles the city should consider to promote sustainable building practices in the city. One part of the study will address green building practices in city-owned facilities and is certain to include purchasing high efficiency equipment as well as other green products. The city may utilize resources from the Consortium for Energy Efficiency as this topic advances.