

ENERGY STAR[®] Procurement Toolkit for Municipalities

Fall 2005

Report Prepared For:

Greater Toronto Area Clean Air Council (GTA-CAC)

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A Report Prepared for the GTA Clean Air Council

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CAP would like to thank Natural Resources Canada Office of Energy Efficiency and the GTA Clean Air Council for their funding and support of this work and the Toronto Atmospheric Fund for its ongoing financial support.

For information on the ENERGY STAR initiative in Canada, visit the website of Natural Resources Canada's Office of Energy Efficiency (OEE), located at <http://energystar.gc.ca>, or call the OEE toll-free publications line at 1 800 387-2000.

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Dear GTA Clean Air Council members:

On behalf of the Clean Air Partnership, I am pleased to provide you with a copy of this ENERGY STAR® Procurement Toolkit for Municipalities. In it you will find helpful information to get you started down the road to saving money through more energy-efficient purchases. This report was prepared with the support of the GTA Clean Air Council and Natural Resources Canada's Office of Energy Efficiency as part of a commitment made through the Toronto and Region 2004 Inter-governmental Declaration on Clean Air, Article 3.2, which states:

Explore and promote the benefits of adopting an ENERGY STAR® corporate procurement policy by GTA-CAC members, which would require that procurement of new computer technology, appliances and other applicable office and operations equipment be ENERGY STAR certified.

We put together this Toolkit for Municipalities because we believe that your purchases can save you money in reduced energy costs and result in reduced environmental impact. The purchasing power of large organizations such as municipalities, other government agencies, and large institutions is an important market force. Even a few municipalities making strategic energy-efficient purchases can influence the market. The more purchasers of ENERGY STAR qualified products, the more the market will move toward greater energy-efficiency.

By learning about the ENERGY STAR initiative and the benefits that can result from purchasing ENERGY STAR qualified products, municipalities will save money and our communities will become healthier and more sustainable. We have published this document in print and online so that municipalities and organizations across the country can benefit from the ideas and information contained herein.

We look forward to hearing about your achievements and any challenges you have encountered! Please don't hesitate to contact us at: gtacac@cleanairpartnership.org.

Sincerely,

A handwritten signature in black ink, appearing to read 'Eva Ligeti'. The signature is fluid and cursive, written in a professional style.

Eva Ligeti
Executive Director
Clean Air Partnership

Executive Summary

This procurement toolkit was designed to help member municipalities of the Greater Toronto Area Clean Air Council (GTA-CAC) purchase energy-efficient ENERGY STAR[®] qualified products that will save them money through reduced energy use.

Purchasing energy-efficient products can be challenging without having adequate information. The results of a survey of GTA Clean Air Council member municipalities in 2004 revealed three specific needs of municipal staff.

These were:

1. **Adequate information about ENERGY STAR qualified products,**
2. **Clear examples of procurement language that municipal staff can modify and use in their own procurement contracts, and**
3. **Information about where to purchase ENERGY STAR qualified products.**

With this in mind, this Toolkit was designed to address these specific needs, and to help municipalities start saving money. The Toolkit is divided into sections, each section making the case for energy and financial savings.

The **Background** section outlines the ENERGY STAR initiative along with the environmental and financial reasons you should consider an ENERGY STAR procurement policy in your jurisdiction.

The **Procurement and Implementation** section provides tips on ENERGY STAR procurement, a timeline for implementation that you can adapt for your jurisdiction and suggestions for promoting your municipality's initiative.

The **Products** section provides an updated list of the types of products that are ENERGY STAR qualified and explains the energy-efficiency characteristics to look for in those products.

To show you that it can be done, the Toolkit also provides a section called "**Pictures of Success**" – stories of municipalities who have realized the environmental and economic benefits of increasing their efficiency through their procurement practices.

The final sections link to further useful resources and publications, and sample procurement language.

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1.0 ENERGY STAR Background

Municipalities spend a lot of money on the energy that is needed to operate their facilities. From computers, photocopiers and fax machines in their offices, to boilers and air conditioners in their buildings, energy costs are a significant amount of municipal budgets. This toolkit is meant to address ways in which municipalities can lower these energy costs through the purchase of ENERGY STAR® qualified products. The savings in energy costs can then be directed to other municipal programs. What's more, since ENERGY STAR qualified products also help the environment, municipal employees can take pride in knowing that their employer is striving to provide them with a healthier work environment.

How to use this toolkit

We've tried to provide enough pointers to additional information in the toolkit so that you can always learn more when you require it. But we recognize that people who make purchasing decisions are often juggling many tasks. Each section is designed to provide clear and useful information. It is not necessary to read the entire toolkit from start to finish – simply go directly to the section that interests you the most.

Throughout the guide, the following icons indicate what you are looking at:



Our hope is that this guide will be a quick reference that municipal staff can use to make purchasing decisions, and over the long term, develop procurement policies that include ENERGY STAR qualified products. We hope that you find this toolkit useful.

Legal Disclaimer

This toolkit was created using the best information available at the time of writing. Users of this toolkit should verify that the information used to make purchasing decisions is the most up-to-date by consulting the numerous other resources referenced throughout this document.

1.1 What is ENERGY STAR?



ENERGY STAR® is an internationally recognized symbol for energy efficiency.

The ENERGY STAR symbol helps consumers easily identify the most energy-efficient products.¹ Manufacturing companies shall ensure that the products that they make meet strict energy-efficient criteria before they can use the ENERGY STAR logo.

The History of ENERGY STAR

ENERGY STAR is an initiative that was originally created by the United States Environmental Protection Agency (U.S. EPA). In 1992, the U.S. EPA introduced a voluntary labelling program designed to promote energy-efficient products.

The first products that were labelled were computers and computer monitors. The program has since expanded to include many other product categories and partnerships in the private and public sectors. The ENERGY STAR label can now be found on photocopiers, heating and cooling products, lighting, and other electronic devices.^{2, 3}

ENERGY STAR is now an international initiative. Major manufacturers, retailers, utilities, and governments from Australia to Europe recognize the benefits of ENERGY STAR to consumers and have joined in promoting the symbol.

In Canada, Natural Resources Canada's Office of Energy Efficiency promotes the international ENERGY STAR symbol in Canada and monitors its use.⁴ Natural Resources Canada is a leading organization in helping Canadians save energy and reduce greenhouse gases.


Rising energy costs and growing evidence of climate change and other environmental problems associated with the combustion of fossil fuels have many Canadians thinking hard about their energy choices. ENERGY STAR qualified products help Canadians to identify and purchase products that are "top of their class" in terms of energy efficiency.

ENERGY STAR and EnerGuide

EnerGuide is a Canadian initiative that requires “EnerGuide labels to be affixed to major household appliances to help the Canadian buying public compare the energy consumption of products sold in Canada.”⁵ The ENERGY STAR logo however signifies that a product is one of the most energy-efficient products in its class. The two initiatives are complementary in Canada, and both allow consumers to make wise choices about their purchases.

EnerGuide for Industry

EnerGuide for Industry is a Government of Canada initiative aimed at helping Canada meet its Kyoto Protocol targets. The energy rating program uses the familiar EnerGuide name and interactive tools to help energy-wise industries make the right choice when purchasing "off the shelf" equipment such as motors, heating and cooling equipment, lighting products, refrigeration products, boilers, compressors, and pumps.⁶

	EnerGuide for Industry
	For more information on EnerGuide for Industry see: http://oee.nrcan.gc.ca/egi/english/index.cfm
	ENERGY STAR Qualified Product Manufacturers in Canada
	For information about organizations that have become participants and are promoting and using the ENERGY STAR symbol in Canada see: http://oee.nrcan.gc.ca/energystar/english/participants/onboard_part.cfm

1.2 Why Choose ENERGY STAR?

Energy costs are rising, and this trend is expected to continue. It makes sense for municipalities to choose ENERGY STAR® qualified products for two very important reasons:

1. To save money



Energy costs are rising. Electricity rates in Ontario have increased, and the costs of electricity production from nuclear and fossil fuel power plants continue to rise. Investing in more energy-efficient equipment saves dollars and makes sense.

Buying ENERGY STAR qualified products could save a municipality thousands of dollars in energy costs every year. The money saved by lowering energy costs can be directed to other municipal programs.

This toolkit will highlight the energy and financial savings of ENERGY STAR qualified products compared to standard products. The savings calculators referenced in Section 1.3 provide detailed examples of energy and financial savings.

2. A healthier environment and healthier communities

A lot of electricity is still generated by burning fossil fuels such as coal, oil, and natural gas. Burning these fuels releases carbon dioxide (CO₂), nitrous oxides (NO_x), and sulphur dioxides (SO_x) into the atmosphere and contributes to climate change, urban smog, and acid rain.⁷

Choosing products that are more energy-efficient means that less fossil fuels are burned, and our air is filled with less greenhouse gases, acid rain, and smog.⁸ By changing purchasing practices, everyone can help contribute to a healthier environment and healthier communities.

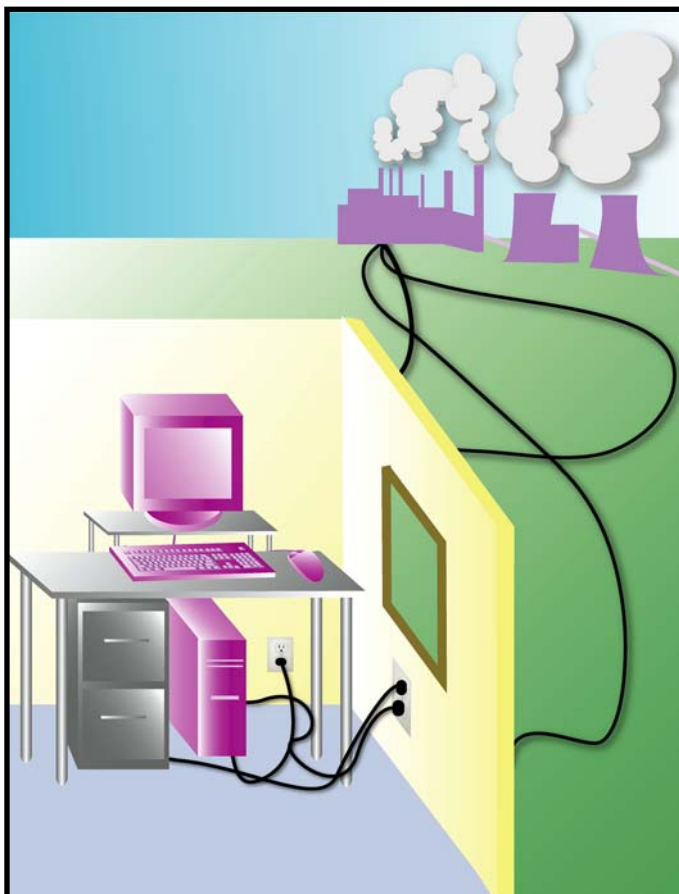
Many organizations, businesses, and municipalities have begun to implement ENERGY STAR into their procurement practices and have realized significant savings. Please see Section 5 for examples.



Reducing Greenhouse Gases

An ENERGY STAR® procurement strategy supports federal and provincial goals associated with the ratification of the Kyoto Protocol, and may help municipal commitments to environmental protection programs such as the Federation of Canadian Municipalities Partners for Climate Protection Program.⁹

The Province of Ontario and the City of Toronto have both committed to reducing their energy use in the coming years. Ontario has set a goal of reducing energy use in its buildings by 5% by 2007 and by 10% by 2010.¹⁰ Ontario municipalities already play an important part in reducing greenhouse gases, and this toolkit can help them play an even bigger role.



1.3 How do ENERGY STAR Qualified Products Save Money?

To see if your municipality will save money by purchasing ENERGY STAR[®] qualified products, consider the following example:

A municipality in Canada learns that the photocopiers in its offices are consuming more energy than similar ENERGY STAR qualified photocopiers. To calculate the savings that could be expected from purchasing ENERGY STAR qualified photocopiers to replace the existing photocopiers, a procurement officer uses the Natural Resources Canada Office of Energy Efficiency Savings Calculator.

The Savings Calculator is actually an Excel Workbook that helps calculate the potential savings from purchasing ENERGY STAR qualified products.¹¹ The ENERGY STAR Savings Calculator is available for download at:

<http://oee.nrcan.gc.ca/energystar/english/participants/procurement/calculator.cfm?>

Savings Calculator Example for Medium-Speed Photocopiers

Medium-speed Photocopiers	Regular Photocopier	ENERGY STAR Qualified Photocopier
Number of units	20	20
Watts per unit in "off" mode	14	7.5
Initial cost per unit (estimated retail price)	\$7,500	\$7,500
Assumed product lifetime (years)	6	6
Operating Costs for 200 medium-speed copiers		
Annual Operating Costs		
Energy cost	\$1,866	\$1,296
Energy consumption, kWh (annual)	15,487	10,757
Maintenance cost	\$0	\$0
Total annual operating costs	\$1,866	\$1,296
Life-Cycle Costs		
Lifetime operating cost (energy and maintenance)	\$8,128	\$5,645
Energy costs (lifetime)	\$8,128	\$5,645
Energy consumption, kWh (lifetime)	92,921	64,540
Maintenance costs (lifetime)	\$0	\$0
Purchase price for 1000 unit(s)	\$150,000	\$150,000
Total life-cycle costs	\$158,128	\$155,645
Annual cost savings		\$570
Approximate savings over product lifetime		\$2,482
Total CO ₂ equivalent savings, kg (annual)		2,564

(Adapted from <http://oee.nrcan.gc.ca/energystar/english/participants/procurement/calculator.cfm?>)

In the example above, purchasing 20 new ENERGY STAR Photocopiers will save the municipality \$2,482 and reduce CO₂ by 2,564kg over the next 6 years!

1.4 How do ENERGY STAR Qualified Products Save Energy?

Municipalities know capital costs of equipment are not the only thing that needs to be considered in a procurement strategy.¹² The total costs of operating equipment include the energy used while products are operating and while idle, as well as such things as the increased demand for air conditioning in summer months due to heat generated by office products. ENERGY STAR[®] qualified products must achieve industry-accepted energy-efficient technical specifications. By purchasing energy-efficient products, municipalities can save in their energy costs and use their savings to fund other municipal programs.

1.5 How do ENERGY STAR Qualified Products Help the Environment?

In the United States in 2004, the United States Environmental Protection Agency estimated that Americans saved enough energy through energy-efficient purchases to power 24 million homes.

As well, they avoided producing greenhouse gas emissions equivalent to those from 20 million cars. What's more, the estimated financial savings was \$10 billion.¹³



2.0 ENERGY STAR Qualified Products for Municipalities



Energy represents 30% of a typical office building's operating costs – the largest cost of operating the building.¹⁴ Offices are just as important to the environment as they are to the economy, with computers and other office equipment among the fastest-growing electricity uses in North America.¹⁵ Since computers, printers, photocopiers, fax machines and scanners are all essential equipment in modern offices; the energy demands of offices can be significant.¹⁶



Municipalities typically have hundreds or thousands of offices in which their employees work. Each purchase that municipalities make can have a significant effect on its bottom line, as well as on the environment. ENERGY STAR® may be a new consideration for some municipalities, but buying more energy-efficient products only makes sense.

Many ENERGY STAR qualified office products are readily available for purchase in Canada. These products have the ability to switch into “sleep” or low-power mode if they are not being used, and the energy savings can be significant, especially for large organizations.¹⁷ Municipalities that choose ENERGY STAR qualified products save money and help the environment without sacrificing style or performance. So how do you begin to switch your offices over to ENERGY STAR? The following section will get you started.

This toolkit will help you choose ENERGY STAR qualified products. After you know where to look for them (see following sections and Appendix 4) you will be able to recognize ENERGY STAR qualified products by looking for the ENERGY STAR symbol (at right).



How do products qualify for the ENERGY STAR symbol?

ENERGY STAR qualified products must meet or exceed technical specifications endorsed by the Government of Canada. Requirements vary from one category to another, but typically the product must be from 10 to 50 percent more efficient than standard products to be allowed to carry the ENERGY STAR symbol. For example, an ENERGY STAR qualified refrigerator must be at least 15 percent more efficient than the standard/base model.

New ENERGY STAR qualified products are added on a continual basis. Please consult the ENERGY STAR Website for the most up-to-date listing of products and categories and qualifying specifications.

For more information, please visit: <http://www.energystar.gc.ca>



ENERGY STAR Qualified Products in Canada

Natural Resources Canada's Office of Energy Efficiency web site lists ENERGY STAR qualified products.


See <http://oee.nrcan.gc.ca/energystar/english/consumers/products.cfm?>

2.1 Types of ENERGY STAR Products

You may have asked yourself, “what other types of products are available?” The answer to this question is likely “everything that you need.” In Canada, the following types of products are labelled and promoted with the ENERGY STAR[®] symbol – and you will find that the number of products is growing all the time:

- **Office equipment:** Computers, monitors, photocopiers, multi-functional devices, printers, fax machines, combination printer/fax machines, scanners, bottled-water coolers, mailing machines
- **Residential appliances:** Clothes washers, refrigerators, freezers, refrigerator-freezers, dishwashers, bottled- water coolers
- **Heating, ventilating and air conditioning equipment:** Room and central air conditioners, residential gas furnaces, residential boilers, air-to-air and ground-source heat pumps, dehumidifiers, ventilating fans and ceiling fans, programmable thermostats
- **Consumer electronics:** TVs, VCRs, DVD players, combination units, home audio products, cordless telephones/answering machines
- **Lighting and signage:** Compact fluorescent lights, exit signs, traffic signals
- **Windows, doors and skylights:** Windows, doors and skylights
- **Commercial and industrial products:** Commercial clothes washers, solid door refrigerators and freezers

2.2 Specifications of ENERGY STAR Qualified Office Products

	Specifications for ENERGY STAR[®] Qualified Office Products
Equipment	ENERGY STAR Specification
Computers	<ul style="list-style-type: none"> • Automatically enter a low-power "sleep" mode after a period of inactivity. • Efficiency specifications based on power supply.
Monitors	<ul style="list-style-type: none"> • Automatically enter two successive low-power modes of 15 W and 8 W after 15 to 30 minutes of inactivity.
Copiers	<ul style="list-style-type: none"> • Depending on copier speed, automatic powerdown and shut-off – 5 to 20 W or less after 30 to 90 minutes or less of inactivity. • Separate specifications available for large-format copier models. • Recommended: automatic double-sided copying
Multifunction Devices	<ul style="list-style-type: none"> • Automatic power-down to 25 to 105 W after 15 to 120 minutes of inactivity, depending on equipment speed. • Automatic double-sided copying on machines that copy at 45 images per minute or faster.
Printers	<ul style="list-style-type: none"> • Automatic power-down to between 10 and 75 W, depending on print speed.
Fax Machines	<ul style="list-style-type: none"> • Automatic power-down to between 10 and 15 W after 5 minutes of inactivity, depending on fax speed.
Mailing Machines	<ul style="list-style-type: none"> • Depending on product speed, automatically powers down to sleep mode of 10 to 85 W or less after 20 to 60 minutes of inactivity.
Scanners	<ul style="list-style-type: none"> • Automatic power-down to 12 W or less when not in use.
Bottled-Water Coolers	<ul style="list-style-type: none"> • Cold-only and cook-and-cold bottled units – energy use is equal to or less than 0.16 kWh / day. • Hot-and-cold bottled units; energy use is less than or equal to 1.20 kWh/day.

(Table adapted from <http://oee.mcan.gc.ca/energystar/english/participants/procurement/products.cfm>; See <http://www.energystar.gc.ca> for the most up-to-date product specifications)

2.3 ENERGY STAR Qualified Products

Note: Every effort has been made to provide up-to-date and accurate information. However, it is up to the reader to check the sources of information for updates and further details. Please also refer to Appendix 2 for definitions of energy terms.

The following section provides more detail on ENERGY STAR[®] qualified products that municipalities may wish to purchase. These items include:

- A. Photocopiers
- B. Computers and monitors
- C. Lighting and signage
- D. Traffic signals
- E. Heating, ventilating, and cooling products (HVAC)

A. Photocopiers

Photocopiers are the most energy-intensive type of office equipment because they sit idle for long periods of time.¹⁸ Photocopiers contribute more than 10% to the overall energy budget of the office. More surprising is that most of the 90% of this is consumed when the copiers are not even being used!¹⁹

Because most copiers are left on 10 hours a day, power management features are important for saving energy and an easy way to reduce air pollution.²⁰ Fortunately, many modern photocopiers have excellent energy-saving features.

A lot of energy can also be saved by turning off photocopiers when they are not in use - the idea that leaving them on saves more energy is a myth.²¹ You may even wish to consider a copying schedule for your employees, if it is realistic for your office.



Specifications for ENERGY STAR Qualified Standard Photocopiers & Large-Format Photocopiers

Standard Photocopiers

Copier Speed in copies per minute (cpm)	0-20	21-44	45 or more
Low-Power Mode (watts)	None	3.85xcpm + 5	3.85xcpm + 5
Low-Power Default Time	N/A	15 minutes	15 minutes
Recovery Time of 30 Seconds	N/A	Yes	Recommended
Off Mode (watts)	≤ 5	≤ 15	≤ 20
Off-Mode Default Time	≤ 30 minutes	≤ 60 minutes	≤ 90 minutes
Automatic Duplex Mode	No	Optional	Optional

Large-Format Photocopiers

Copier Speed in copies per minute (cpm)	0-40	41 and more
Low-Power Mode (watts)	N/A	3.85 x cpm + 5
Low-Power Default Time	N/A	15 minutes
Recovery Time of 30 Seconds	N/A	Recommended
Off Mode (watts)	≤ 10	≤ 20
Off-Mode Default Time	≤ 30 minutes	≤ 90 minutes
Automatic Duplex Mode	No	No



See Appendix 5 for Sample Procurement Language for ENERGY STAR Qualified Photocopiers

(Table adapted from <http://oee.nrcan.gc.ca/energystar/english/participants/procurement/copiers.cfm>; See <http://www.energystar.gc.ca> for the most up-to-date product specifications)

B. Computers and Monitors

Most large municipalities may need to purchase hundreds of computers, and at the current rate of technological advance, are likely to replace them often. Depending on the needs of employees, some municipalities may wish to provide their employees with notebook computers. To make your purchasing decisions, you should understand the differences in energy use.


Desktop Computer versus Notebook Computers


Energy consumption is a critical factor in notebook computer design since their portability demands that their batteries are not drained quickly. Notebook (or “laptop”) computers therefore have “the most energy-efficient displays (LCD), adapters, hard disks and CPUs that are available.”²² In fact, an ENERGY STAR[®] qualified laptop computer can use up to 70% less electricity than computers without enabled power management features.²³

Municipalities may wish to give their employees a choice between desktop and laptop. This should involve consultation with staff, because some people find notebook computers uncomfortable to use from an ergonomic perspective. Laptops are also more expensive to replace, more complex to repair, and harder to update. Ultimately, the best solution is one that best suits employees while providing energy-saving features.



The information below compares desktops and laptop computers.

	A Comparison of Typical Desktop and Notebook Computers			
	Component	Desktop	Notebook	Energy Savings
	CPU	120 Watts	30 Watts	90 Watts
	Monitor	80 Watts	(included above)	80 Watts
	Total	200 Watts	30 Watts	170 Watts

	Did You Know?
	<p>“Comparing the 30W for a powerful notebook (including LCD screen) ... with the 120W desktop PC plus the 80 W CRT screen, savings could really be up to 80%. And even in the notebooks intended as 'desktop replacement', with a larger screen (up to 16-17") and less aggressive power management settings, the savings are still well over 50%.”²⁴</p>

(Table adapted from http://www.eu-energystar.org/en/en_022.htm)



Specifications for ENERGY STAR Qualified Computers

There are the two guidelines – A and B – under which a computer can be ENERGY STAR® qualified.

Guideline A refers to:

- Computers that are shipped with the capability to be on networks such that they can remain in their low-power/sleep mode while their network interface adapter retains the ability to respond to network queries.
- Computers that are shipped with no network interface capability.
- Computers shipped to a non-networked environment.

Guideline B refers to:

- Computers that are shipped with the capability to be on networks that currently require the computer's processor and/or memory to be involved in maintaining its network connection while in sleep mode.
- Computers that can maintain identical network functionality in and out of sleep mode.

Guideline	Power Supply (watts)		Power Consumption in Sleep Mode (watts)
Will enter a sleep mode within 30 minutes of inactivity. If shipped with network capability, will sleep on networks and respond to wake events.	Guideline A	≤ 200 $> 200, \leq 300$ 0 $> 300, \leq 350$ 0 $> 350, \leq 400$ 0 > 400	≤ 15 ≤ 20 ≤ 25 ≤ 30 ≤ 10 percent of power supply's maximum continuous output rating
	Guideline B		≤ 15 percent of power supply's maximum continuous output rating



See Appendix 5 for Sample Procurement Language for ENERGY STAR Qualified Computers and Monitors

(Table adapted from <http://oee.mcan.gc.ca/energystar/english/participants/procurement/computers.cfm>; See <http://www.energystar.gc.ca> for the most up-to-date product specifications)

Computer Monitors

It has been estimated that 60% of the energy used by a typical desktop computer is used to power the monitor.^{25,26}

Municipalities should encourage their employees to turn off their monitors when they are not using them.


Although screen savers were once believed to help extend the life of the monitor, they are no longer necessary because of marked advances in monitor technology in recent years. In fact, screen savers consume more energy than if the monitor were set to power down when not in use.



Cathode Ray Tubes (CRTs) versus Liquid Crystal Displays (LCDs)

Cathode Ray Tube monitors are large and square and take up a lot of desk space. Liquid Crystal Display monitors are flatter, and take up less space on the desk. More importantly, LCDs use less energy.

“When it's time to change your computers, look for energy-efficient systems and monitors. Flat-panel monitors are all the rage today, but be careful - the most energy-efficient ones are liquid crystal display (LCD) monitors. They use 80 to 90 per cent less energy than cathode ray tube (CRT) monitors. Look for electronic products designated as ENERGY STAR—they save up to 75 per cent of the energy typically consumed by their conventional counterparts.”²⁷

 Specifications for ENERGY STAR® Qualified Computer Monitors		
Low-Power Model	First Low-Power (Sleep) Mode	Second Low-Power (Deep Sleep) Mode
Maximum Watts in Low-Power State	≤ 15	≤ 8
Low-Power Model	First Low-Power (Sleep) Mode	Second Low-Power (Deep Sleep) Mode



(See <http://www.energystar.gc.ca> for the most up-to-date product specifications)

C. Lighting and Signage

Compact Fluorescent Light Bulbs

Compact fluorescent light bulbs (CFLs) have really caught on with homeowners and apartment dwellers as they learn about their potential financial and energy savings. Advanced technology enables CFLs to use 70 to 75% less energy than a standard incandescent bulb and last up to 10 times longer. That means that by replacing just five regular incandescent bulbs with ENERGY STAR[®] qualified CFL bulbs in areas that require more than three hours of light a day you can save approximately \$30 a year (NRCan).

Workplaces such as the hospitality industry and nursing homes have started to make great use of compact fluorescent lighting. CFLs are a great choice for task lighting in the workplace. ENERGY STAR qualified CFLs provide the same amount of light as incandescent bulbs, but use much less energy.

 <p>Key Differences between Standard Incandescent Light Bulbs and ENERGY STAR Compact Fluorescent Light Bulbs</p>		
Standard Incandescent Bulb (watts)	ENERGY STAR Qualified CFL (approximate equivalent watts)	Minimum Light Output (lumens)
40	10	450
60	15	800
75	20	1100
100	29	1600
150	38	2600
 <p>Compact Fluorescent Lighting Cost-Savings Example</p>		

Lighting	Non-ENERGY STAR Life-Cycle Energy Costs	ENERGY STAR Life-Cycle Energy Costs	ENERGY STAR Energy Cost Savings Over Product's Estimated Life	CO ₂ Emissions Equivalent of Removing Cars From Road (number per year)
200 Compact Fluorescent Lamps	\$11,080	\$2,770	\$8,310	2

(Table adapted from <http://oee.nrcan.gc.ca/energystar/english/consumers/reference-card.cfm?> and <http://oee.nrcan.gc.ca/energystar/english/participants/procurement/lighting.cfm>; See <http://www.energystar.gc.ca> for the most up-to-date product specifications)

Other types of lighting


Beyond replacing task lighting, you may find many other opportunities in your municipal buildings to save energy by replacing existing lighting. For example, in warehouses, standard 8-ft. 75-W fluorescent lamps with standard magnetic ballasts can be replaced to pairs of 4-ft. T-8 fluorescent lamps with electronic ballasts for considerable financial and energy savings.²⁸

Exit signs

Exit signs can add considerable costs to the energy budget of municipalities, because the lamps inside are not always the most energy-efficient. By replacing standard exit sign lamps with Light Emitting Diode (LED) lamps, considerable financial and energy savings can be achieved.

D. Traffic signals

ENERGY STAR traffic signals use “90% less energy than conventional signals, while providing reliable, long-lasting, and low-maintenance performance.”²⁹ The following specifications are provided to help you make informed decisions about lighting selection for your municipality.

 Specifications for ENERGY STAR® Qualified Lighting and Signage Products																							
Compact Fluorescent Lamps <ul style="list-style-type: none"> Two-year warranty on residential bulbs; one-year warranty on commercial bulbs. Bare lamps: <table border="0"> <tr> <td>Less than 15 W:</td> <td>45 lumens/W</td> </tr> <tr> <td>15 W or more:</td> <td>60 lumens/W</td> </tr> </table> Covered lamps: <table border="0"> <tr> <td>Less than 15 W:</td> <td>40 lumens/W</td> </tr> <tr> <td>15-19 W:</td> <td>48 lumens/W</td> </tr> <tr> <td>19-25 W:</td> <td>50 lumens/W</td> </tr> <tr> <td>More than 25 W:</td> <td>55 lumens/W</td> </tr> </table> 			Less than 15 W:	45 lumens/W	15 W or more:	60 lumens/W	Less than 15 W:	40 lumens/W	15-19 W:	48 lumens/W	19-25 W:	50 lumens/W	More than 25 W:	55 lumens/W									
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19-25 W:	50 lumens/W																						
More than 25 W:	55 lumens/W																						
Exit Signs <ul style="list-style-type: none"> Operate on 5 W or less per face. <table border="1"> <thead> <tr> <th>Module Type</th> <th>Maximum Watts</th> <th>Nominal Watts</th> </tr> </thead> <tbody> <tr> <td>12" Red ball</td> <td>17</td> <td>11</td> </tr> <tr> <td>8" Red ball</td> <td>13</td> <td>8</td> </tr> <tr> <td>12" Red arrow</td> <td>12</td> <td>9</td> </tr> <tr> <td>8" Green ball</td> <td>12</td> <td>12</td> </tr> <tr> <td>Orange hand</td> <td>16</td> <td>13</td> </tr> <tr> <td>12" Green arrow</td> <td>11</td> <td>11</td> </tr> </tbody> </table>			Module Type	Maximum Watts	Nominal Watts	12" Red ball	17	11	8" Red ball	13	8	12" Red arrow	12	9	8" Green ball	12	12	Orange hand	16	13	12" Green arrow	11	11
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(Table adapted from <http://oee.nrcan.gc.ca/energystar/english/participants/procurement/traffic.cfm>; See <http://www.energystar.gc.ca> for the most up-to-date product specifications)



See Appendix 5 for Sample Procurement Language for ENERGY STAR® Qualified Lighting and Signage Products.



ENERGY STAR – Lighting and Signage

<http://oee.nrcan.gc.ca/energystar/english/consumers/light.cfm>

ENERGY STAR Compact Fluorescent Lighting Questions and Answers




<http://oee.nrcan.gc.ca/energystar/english/consumers/questions-answers.cfm>

Change a Light, Change the World (U.S. ENERGY STAR site)

http://www.energystar.gov/index.cfm?c=lighting.pr_lighting

E. Heating, Ventilating, and Cooling Products

Large municipalities are often the custodians of hundreds of buildings. These buildings need to have comfortable environments in which to work, and therefore require adequate heating, ventilating, and cooling equipment, also known as “HVAC” for short. This type of equipment can attain ENERGY STAR certification if it meets the specifications that follow. Remember to consider ENERGY STAR qualified HVAC products for new buildings and retrofits of existing buildings.

	<p>Specifications for ENERGY STAR® Qualified Heating, Ventilating and Air Conditioning (HVAC) Products</p>
<p>Equipment</p>	<p>ENERGY STAR Specification*</p>
<p>Furnaces (Fossil Fuel)</p>	<ul style="list-style-type: none"> • At least 90 Annual Fuel Utilization Efficiency (AFUE).
<p>Room Air Conditioners</p>	<ul style="list-style-type: none"> • At least 15 percent more energy-efficient than the minimum federal government standards. • Depending on the size, between 10.7 and 9.4 EER.
<p>Programmable Thermostats</p>	<ul style="list-style-type: none"> • Capability of maintaining at least two separate programs (to address the different comfort needs on weekdays and weekends) and at least four temperature settings for each program.
<p>Dehumidifiers</p>	<ul style="list-style-type: none"> • Standard capacity (10 to 35 L/day) has an energy factor greater than or equal to 1.20 to 1.50 L/kWh. • High capacity (36 to 57 L/day) has an energy factor greater than or equal to 2.25 L/kWh.
<p>Geothermal Heat Pumps</p>	<ul style="list-style-type: none"> • Open loop – greater than 3.6 Coefficient of Performance (COP) (heating), greater than 16.2 EER (cooling). • Closed loop – greater than 3.3 COP (heating), greater than 14.1 EER (cooling). • Direct expansion – greater than 3.5 COP (heating), greater than 15 EER (cooling).
<p>*For an explanation of HVAC energy terms, please refer to Appendix 2</p>	
	<p>See Appendix 5 for Sample Procurement Language for ENERGY STAR HVAC Products</p>
	<p>Global Green USA Heating, Cooling and Ventilation http://www.eere.energy.gov</p> <p>ENERGY STAR Boilers (U.S.) http://www.energystar.gov/index.cfm?c=boilers.pr_proc_boilers</p>

(Table adapted from <http://oee.rncan.gc.ca/energystar/english/participants/procurement/products.cfm>)

3.0 ENERGY STAR Procurement & Implementation Plan

3.1 ENERGY STAR Procurement



Purchasing ENERGY STAR® qualified products may seem like a daunting task if the suppliers that your municipality usually deals with do not offer the ENERGY STAR qualified products that you want. By using the information in this toolkit, it is hoped that those who make procurement decisions will be able to move their municipalities toward choosing vendors who do offer ENERGY STAR qualified

products.

A lot of work goes into a procurement policy, and such policies are sometimes difficult to change. However, since ENERGY STAR qualified products are widely available, procurement policies should be reviewed to make sure municipalities save both money and energy. Your purchasing power can influence the market! The buying power of large organizations such as municipalities, other government agencies as well as large institutions is an important market force ... You just have to ask!

Making a commitment to purchase ENERGY STAR qualified products will require support from staff, senior management, and Council. Once you have made the decision to begin down the path to ENERGY STAR procurement, you will need to consider how to engage these different audiences.

The first step to implementing the program requires you to **make a commitment** to review current policies and consider implementing new ones. Once the commitment is in place, which may require staff-level approvals, you can **assess your current performance and set goals for implementation**.

Closely related to the assessment step is **the creation of an action plan**, which will include a business case for purchasing ENERGY STAR products and a plan to revise procurement policies and development of communications materials and timelines for implementation. This action plan should also contain any expenses you foresee beyond the purchases you will make. At this point you may need to approach Council in order to get approval for the action plan and permission to revise purchasing policies.

Once the action plan is created and approved, it is time to **begin implementation** of the plan. This will likely occur in stages depending on your current procurement timelines and the action plan that you have created. In the earlier stages of the program, you will want to notify current product suppliers and consider revising current procedures. You may want to consider phasing in the types of ENERGY STAR qualified products that you purchase, for instance begin with computers, and develop the policies and procedures and then move to lighting and develop those policies and procedures, etc.

As with any change in municipal procedure, it is important to **evaluate the program**. The evaluation timelines can be set out while you are creating the action plan. The evaluation program should include a summary of the changes that have been made

since the program began and the resulting energy savings and environmental benefits. You will also likely want to note any barriers that were encountered and the areas of future action. This process of evaluation should be ongoing as new products are added frequently to the list of qualifying products and specifications may change.

3.2 ENERGY STAR Implementation Timeline

We have tried to include information in this toolkit to help you to incorporate ENERGY STAR® qualified products into your procurement practices. We do realize that municipalities face the dual challenges of budget and policy cycles. Change does not happen overnight. However, with knowledge of ENERGY STAR qualified products, you now know how to save your municipality energy and money, and at the same time help the environment. The following timeline is only an example of what may be possible for your municipality. With creative solutions to implementation, you might make the commitment to ENERGY STAR much quicker!

	<p>Did You Know?</p> <p>Natural Resources Canada's Office of Energy Efficiency provides Energy Efficiency Training and Awareness for Organizations. See: http://oee.nrcan.gc.ca/commercial/training-awareness/index.cfm?</p>
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Within 1 Month – Make a Commitment and Assess Performance

- Obtain any necessary approvals from your manager prior to reviewing existing procurement policies.
- Form a team of people that can help review existing procurement policies or provide technical knowledge of the products used in your municipality (boilers, traffic signals etc.).
- Review existing major contracts and determine the volume of energy-using products that are purchased annually.
- Review current procurement policies and collect all related documentation to determine if any green procurement language already exists.

Within 2 Months – Set Goals

- Set goals on what you hope to accomplish with new purchasing policies.
- Develop a business case for purchasing ENERGY STAR qualified products.
- Revise implementation timeline as necessary.

Within 3 Months – Create an Action Plan

- Examine existing inventories of purchased products – or if none exist, determine ways that they can be created.
- Make inventories available to procurement and maintenance departments.
- Identify products to be replaced by ENERGY STAR qualified products.
- Revise procurement policies by incorporating ENERGY STAR language
- Revise procurement contracts to include ENERGY STAR procurement language (see the latter sections of this toolkit).
- Estimate the cost of current energy-using equipment/products expenditures.
- Review energy bills and calculate the savings that would be realized by the municipality if ENERGY STAR qualified products replaced existing products, using the ENERGY STAR Savings Calculator at:
<http://oee.nrcan.gc.ca/energystar/english/participants/procurement/calculator.cfm>
- Examine current vendors-of-record and determine whether these vendors supply ENERGY STAR qualified products. If not, ask whether these vendors are willing to start.
- If necessary, make a presentation to finance department on findings to date.

Within 6 Months – Implement Action Plan

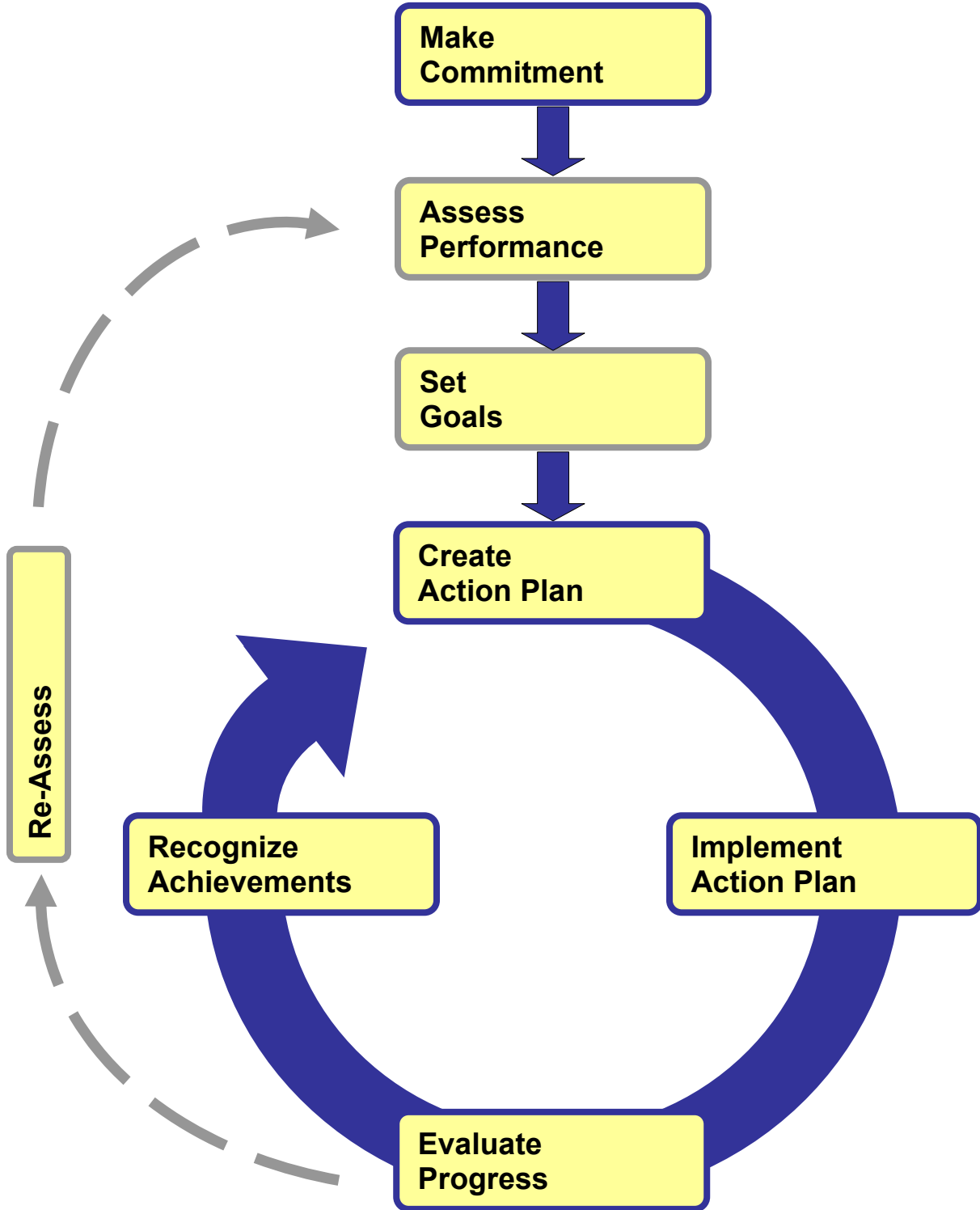
- Communicate the goals of the municipality or department
- Communicate the fact that the organization is moving toward improving its energy efficiency through the purchase of ENERGY STAR qualified products and increase employee awareness through campaigns, contests, or intranet and email messages.
- Ensure that all new contracts specify the need to supply ENERGY STAR qualified products.
- Establish a process for departments to report inventories of products to be replaced with ENERGY STAR qualified products.
- Prepare brochures for employees so that they can better understand the energy-saving features of their computers and monitors.
- Form a team to audit the energy-saving features of current products and schedule energy audits on a department basis.
- Solicit feedback on current products from employees and suppliers.
- Purchase ENERGY STAR qualified products and recycle old products as necessary.

Within 1 year – Evaluate Progress, Reassess, and Recognize Achievements

- Whenever possible, review energy bills to determine the energy and budgetary savings from the ENERGY STAR qualified products that have been purchased using historical data.
- Evaluate your implementation plan and efforts to date to see what worked well and which areas still need improvement.
- Reassess your procurement policies and documents to look for new ways to introduce ENERGY STAR procurement language where possible and practical.
- Reassess your ENERGY STAR procurement goals for the coming year.
- Recognize achievements in your organization and report these achievements to employees.

The following flowchart from the ENERGY STAR web site outlines the steps to take in order to assess and manage your municipality's energy demands.

See: http://www.energystar.gov/index.cfm?c=guidelines.guidelines_index for more information to modify the process to suit your own municipality.



(Adapted from: http://www.energystar.gov/ia/business/guidelines/images/guidelines_steps.gif)

3.3 How to Promote ENERGY STAR

You can help promote ENERGY STAR® in your municipality in the following ways:

Email

Create a message that explains why your municipality is purchasing ENERGY STAR qualified products and the benefits that they will bring to your municipality. An email may contain the following message:

Dear Employees,

Our municipality has made a commitment to purchase only ENERGY STAR- qualified products. These products save energy and money, without compromising performance. You likely already use some of these products each day – many computers and monitors that we have already purchased are ENERGY STAR qualified products. What you may not realize is that many other products can also attain the ENERGY STAR qualification – everything from photocopiers and fax machines, to traffic signals and exit signs. For more information, and to ask questions about this new initiative, please visit our intranet site at <http://intra.municipality.on.ca>.

Web Pages

The intranet site of your municipality is a great place to create greater awareness about ENERGY STAR. You may also wish to work with your webmaster to communicate to residents in your municipality the steps that you are taking to become more energy-efficient.

Brochures and Newsletters

Brochures that explain why your municipality is purchasing ENERGY STAR qualified products and how this will affect the municipality can be distributed to employees with materials that they may regularly receive and to residents in the municipality when there is an opportunity. Be sure to feature ENERGY STAR in your municipal newsletter as well.

Lunch room bulletin boards

Your employees may be the best people to spread the word about ENERGY STAR. Many of the products such as lighting that your municipality may purchase are available for homeowner to save energy as well. Make sure employees are aware of the efforts that you are taking to save energy. You may even wish to develop an incentive program for employees to make the changes in their own homes. You will not only be a valuable resource to your employees, but your community will become more energy-efficient as well!

Contests, Giveaways, and ENERGY STAR Awareness Days

Another way to educate employees about ENERGY STAR is to plan a contest within your municipality. This may be something as straightforward as giving away compact fluorescent light bulbs to employees that correctly answer questions about the ENERGY STAR initiative. Other options may include entering employee's names in a draw for an energy-efficient air conditioner.

Another type of contest might be to have an intra-office competition to see which part of your municipality can bring in the most receipts for a particular ENERGY STAR qualified product, such as compact fluorescent light bulbs for the home. Contests can be run in conjunction with information sessions about ENERGY STAR during awareness days or a workplace ENERGY STAR campaign that you can coordinate.

PowerPoint Presentations

Prepare PowerPoint presentations that you can post on your Intranet or Web Site. This way, people can spread the word about ENERGY STAR at different levels within, as well as outside of your municipality.



The following PowerPoint presentations available on the web can help get you started on developing your own:

Select slides from ENERGY STAR presentation prepared by NRCan

<http://www.cleanairpartnership.org/gtacac/reports>

US ENERGY STAR Program Advanced Lighting Package Presentation

http://www.e-star.com/docs/energystar_advanced_lighting_package.pdf

European Commission ENERGY STAR promotion tools

http://www.eu-energystar.org/downloads/Pres_03_WEBSITE_PROMOTION-TOOLS.ppt

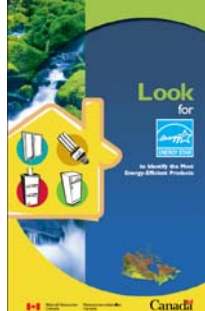
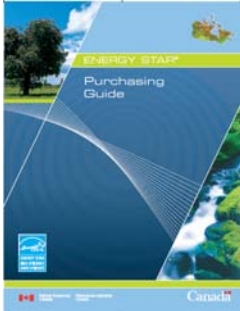
European Commission ENERGY STAR PowerPoint Promo

http://www.eu-energystar.org/downloads/Pres_01 BUMPER_Energy_Star_Conference.ppt

Fact Sheets, Brochures, and Posters

ENERGY STAR Fact sheets, brochures, and posters are available for download from Natural Resources Canada:

<http://oee.nrcan.gc.ca/energystar/english/participants/library.cfm?PrintView=N&Text=N>:



and also from the U.S. ENERGY STAR website:

http://www.energystar.gov/index.cfm?c=energy_awareness.bus_energy_awareness



	<p>Increase employee awareness about energy use at work http://www.energystar.gov/index.cfm?c=energy_awareness.bus_energy_work</p> <p>Useful facts & figures about energy use http://www.energystar.gov/index.cfm?c=energy_awareness.bus_energy_use</p> <p>Easy steps anyone can take right now to save energy http://www.energystar.gov/index.cfm?c=energy_awareness.bus_energy_steps</p>
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<p>Energy-saving tips for the office http://www.energystar.gov/ia/business/ck/examples/ENERGY_STAR_tips_for_the_office.pdf</p> <p>Free handouts, fact sheets, other downloadable resources http://oee.nrcan.gc.ca/energystar/english/participants/library.cfm?PrintView=N&Text=N</p> <p>Employee break room poster Educate employees about what they can do at work and home to save energy. http://www.energystar.gov/ia/partners/rebs/pt_reps_res_retail/files/breakroom_poster.pdf</p> <p>Promote your energy program's achievements http://www.energystar.gov/index.cfm?c=energy_awareness.bus_energy_achievements</p> <p>Increase employee awareness about energy use at home http://www.energystar.gov/index.cfm?c=energy_awareness.bus_energy_home</p>

4.0 Pictures of Success

To understand how organizations such as municipalities can really save energy, money and the environment by adopting ENERGY STAR® into their procurement policies and practices, this section looks at case studies of organizations in Canada and the United States that have already embraced ENERGY STAR. Please also refer to Appendix 1 for links to city and municipal web pages.

4.1 Success in Canada

Vancouver, British Columbia

As of September, 2004, Vancouver changed its procurement policy to read:

“Effective immediately all purchases of equipment, supplies, and appliances will require compliance with the Energy Star and NRCOEE recommendations and guidelines. We recommend that Council ask the Vancouver Parks Board, Vancouver Public Library, and the Vancouver Police Department to implement this policy where applicable to their needs.”³⁰

Vancouver’s “A Discussion Paper on Greenhouse Gas Reduction Planning for the City of Vancouver” also states that the city is developing a strategy to promote the purchase and use of highly energy-efficient equipment, appliances, and technology in City operations and in the community as a whole.³¹

London, Ontario

The City of London has included the following ENERGY STAR language in its procurement contract for its LED Traffic Signal Retrofit Program:

“The Contractor shall provide a copy of the manufacture’s certified test reports for the all LED circular modules and LED pedestrian modules that will verify that the subject units meet or exceed the Energy Star criteria at the time of tendering and prior to the installation of any modules.”³²

Mississauga, Ontario

The City of Mississauga was the first city in Ontario to complete a program that helped them install new brighter and more energy-efficient LED traffic signal lights in its 390 signalized intersections.

“Thanks to the speedy installation of the new traffic signals, we expect to recover our initial costs for this city-wide conversion in only three years,” said Commissioner of Transportation and Works, Martin Powell. “Mississauga residents will appreciate that the new traffic signals will reduce traffic signal maintenance costs and result in 85 per cent savings in the City’s annual hydro bill - savings we have already begun to see.

The conversion to the new LED technology will save the City over \$500,000 annually in electricity and maintenance costs. “As energy costs continue to increase, the City will realize greater benefits and savings from this conversion,” said Powell.³³

The new traffic signals are more reliable than the incandescent signal lights, require less maintenance, and are expected to increase traffic safety and reduce collision potential.

CFB Halifax

Canada Forces base Halifax has 260 buildings. Since June 1995, as part of the Federal Buildings Initiative, CFB Halifax's has improved its energy performance with much success demonstrating that both substantial energy savings and environmental benefits are possible for large organizations. So far, the project has been very successful in demonstrating that substantial financial and energy savings are possible through energy retrofit projects.³⁴

Prior to 1995, CFB Halifax was somewhat concerned with energy management. However, because of increasing budgetary cutbacks and strained resources, energy projects were often put on hold. It became increasingly apparent that the Base needed to find new ways to save money and resources.

Through an energy performance contract with an energy consultant, CFB Halifax greatly reduced its energy costs. The energy consultant was responsible for the technical aspects of energy retrofit projects on the Base, and the Base was able to pay the consultant from the savings realized through lower energy consumption. The Base also conducted detailed audits for all of its buildings to determine areas that would best benefit from energy efficiency improvements.

Base staff became involved in the project through an employee awareness program. Initial projects included steam trap replacement and fluorescent lamp and ballast replacement. These projects immediately improved energy efficiency and improved working conditions for Base employees.

Highlights of CFB Halifax's Energy Measures			
Measure	Cost	Annual Savings	Details
Lighting	\$5.7 million	\$680,000	Upgrade 75 000 fixtures to T-8 lamps and electronic ballasts
Mechanical	\$2.0 million	\$350,000	Upgrades to heating ventilation and air conditioning (HVAC) control system; night temperature and ventilation system
Awareness	\$20,000 / year	\$50,000	An ambitious program contributed to employee participation in energy conservation in the workplace

(Table adapted from <http://oee.mcan.gc.ca/energystar/english/participants/procurement/products.cfm>)

The program at CFB Halifax demonstrates that millions of dollars can be saved through retrofit energy projects. In this case the Base projected savings of \$15 million over 10 years, from which the Base will pay for the energy consultancy services. After 10 years, all of the savings will go back to the Base. The program

also benefited from an employee awareness program that encouraged employees to bring ideas to the program. Actions such as turning off lights and computers at the end of each day help save \$50,000 per year.

4.2 Success in the United States


New York City

With a population of more than 8 million people, New York is the largest city in the United States. A February 2005 report on Environmentally Preferable Procurement outlines the progress that the city has made toward energy-efficiency.³⁵ As part of its procurement policy, the city states:

“In any solicitation by an agency for the purchase or lease of energy-using products, the agency shall include a specification that such products be ENERGY STAR® labeled, provided that there are at least six manufacturers that produce such products with the ENERGY STAR label. Nothing herein shall preclude an agency from including a specification in a solicitation for energy-using products requiring that such products be ENERGY STAR labeled if there are fewer than six manufacturers that produce such products with the ENERGY STAR label.”³⁶

Based on the successful practices and guidelines developed by ENERGY STAR, the City of New York took various measures to improve its energy conservation efforts. In 2004, the actual purchases of products listed below amounted to \$72.7 million (U.S. dollars). The following table shows the breakdown of actual purchases in 2004:

ENERGY STAR qualified product category	Purchase Costs(US\$)
Computers & Related Products	\$ 59,690,959
Copiers	\$ 11,016,653
Fax Machines	\$ 1,046,491
Air Conditioners	\$ 627,027
Printers	\$ 237,252
Refrigerators	\$ 110,025
Total	\$72,728,407



For more information, see:
<http://www.nyc.gov/html/dcas/pdf/environmentalprocurement.pdf>
 and
<http://www.nyc.gov/html/selltonyc/html/mmr.html>

Los Angeles, California

Los Angeles is the second largest city in the United States. The city has developed several web pages that explain how businesses can save energy and money by becoming more energy-efficient. See “A Guide to Energy & Water Efficiency for Your Business” at: <http://www.ladwp.com/ladwp/cms/ladwp000580.jsp>

Los Angeles began replacing its office equipment with ENERGY STAR qualified products in 1998. Since that time, it was estimated that city departments have replaced 75 percent of their copiers, 60 percent of their desktop computers and printers, and 50 percent for fax machines.

The City Council has adopted a City policy directing City departments responsible for procuring office equipment to indicate in bid specifications that products must be ENERGY STAR-compliant. Los Angeles estimates that by 2010, the reduction in emissions resulting from this measure will be 8,318 tons of CO₂ per year (or 9,697,862 kWh per year). The Council action also instructed City departments to designate staff to perform routine checks to ensure the proper configuration of power management features, and to conduct regular training and outreach to build awareness of energy efficiency.³⁷

For more information see the City of Los Angeles Climate Action Plan at: <http://www.lacity.org/ead/EADWeb-AQD/ClimateActionPlan.pdf>

Chicago, Illinois

“In 2000, the City of Chicago took two significant steps to improve energy efficiency in City buildings.

First, the City began to audit and retrofit 15 million square feet of public buildings with efficient equipment for heating and cooling, lighting and ventilation. The 15 million square feet are made up of police stations, libraries, fire stations, park facilities, transit facilities, health centers, community/cultural centers, colleges and other types of facilities that are owned by the City, the Chicago Park District, the Chicago Transit Authority, or the City Colleges of Chicago.

As of June 2004, more than 5 million square feet of City-owned facilities had been audited and retrofitted. When the project is complete, energy savings to the City and its sister agencies are estimated to be \$6 million annually, with \$2 - 3 million in savings for the City alone. In addition, the retrofits will reduce pollution each year by an estimated 30,000 tons of carbon dioxide, 84 tons of nitrous oxides and 128 tons of sulphur dioxides.

The second step the City took was to design new municipal facilities—libraries, police stations and other public buildings—to be more energy-efficient. In designing and constructing these facilities, the City used the U.S. Green Building Council’s Leadership in Energy & Environmental Design (LEED™) Green Building Rating System. In 2004, the City made this practice official by adopting The Chicago Standard to guide the design, construction, renovation, operation, and maintenance of its municipal facilities. The Chicago Standard is based on selected points from LEED that are reasonable and appropriate for Chicago. Adoption of the Standard will result in buildings that save 15 to 20 percent in energy costs annually, conserve water and other natural resources, and provide healthier, more productive indoor environments.”³⁸

Philadelphia, Pennsylvania

The City of Philadelphia’s Municipal Energy Office was established in 1994 and since that time, energy initiatives have saved the City an estimated \$45 million. The city has developed an excellent guide to renovating large buildings that includes electric lighting strategies and life cycle assessment of purchased products.³⁹ See

High Performance Building Renovation Guidelines at <http://www.phila.gov/pdfs/PhiladelphiaGreenGuidelines.pdf> for further information.

Philadelphia has also adopted an Energy Conservation Initiative. The program captures cost saving opportunities by implementing Department level energy conservation practices in building and equipment operations. The goal is to save 5-10% from a historical energy use benchmark. Measures include turning off office equipment when not in use and always at the end of the day, activating computer monitor power management software from the City's intranet, reviewing equipment scheduling (e.g., implementing weekend and night setbacks for heating and cooling equipment), and the establishment of indoor and outdoor lighting schedules.⁴⁰

Seattle, Washington

Seattle is committed to ENERGY STAR purchasing and has developed an excellent web site of information about sustainable purchasing. See <http://www.seattle.gov/environment/purchasing.htm> for further information.

Seattle has a well developed sustainable purchasing policy, which the city makes available for anyone to see at <http://www.cityofseattle.net/purchasing/purchasingservices/ERP6-14.htm>

This is an excellent example of how to develop a policy for your own municipality and how to communicate it to an audience beyond your own department.

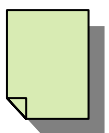
5.0 Conclusion

This toolkit is intended as a resource for anyone interested or involved in procurement for municipalities and large organizations. We hope that it is useful as a first step towards a strategy of green procurement.

Purchasing ENERGY STAR[®] qualified products is an important choice in moving toward a more sustainable future. As we move forward in our understanding of energy and the environment, new technologies will enter the marketplace. Demand-side management will become increasingly important and relevant to our expanding cities and towns.

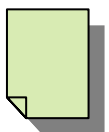
Please use this toolkit as one tool in your quest for continuous improvement in saving energy, money, and the environment. Links to further information are provided in the sections that follow to guide you in learning how to build other aspects of green procurement into your policies and practices. Information is rapidly changing and you may want to keep checking back to the links provided to find out the latest ENERGY STAR qualified products and specifications.

6.0 Other Useful Publications



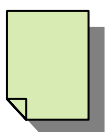
Natural Resources Canada Office of Energy Efficiency Purchasing Tool Kit ⁴¹
<http://oe.e.nrcan.gc.ca/energystar/english/participants/procurement/toolkit.cfm>

“This guide was developed to make it easier for you to purchase energy-efficient products. Tools in this guide help address common purchasing barriers, including lack of information, first-cost bias, and life-cycle cost-analysis requirements. Often, confusion arises due to a perception that change requires a reduction in quality or performance or to not knowing where and how to find what you need. This guide provides clear answers to questions about energy efficiency specifications, product performance and costs and how to find products. With this information, it becomes easy to recognize and communicate the benefits of choosing energy-efficient products.”⁴²



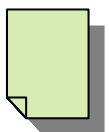
Natural Resources Canada Office of Energy Efficiency Purchasing Guide
<http://www.c2p2online.com/documents/EnergyStarPurchasingBooklet.pdf>

This guide is designed to help organizations purchase energy-efficient products while working within their own framework and rules. Information provided within this guide includes: the benefits of ENERGY STAR qualified products; a listing of products eligible for the ENERGY STAR symbol; a step-by-step implementation plan for energy-efficient purchasing; examples of procurement language; how to make the business case for ENERGY STAR qualified products; and additional resources.



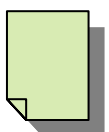
Natural Resources Canada Office of Energy Efficiency Savings Calculator
<http://oe.e.nrcan.gc.ca/energystar/english/participants/procurement/calculator.cfm?>

This calculator allows you to estimate the savings that you can realize by purchasing ENERGY STAR qualified products for your municipality.



Online Guide to Energy-Efficient Commercial Equipment, 2004 Edition ⁴³
http://aceee.org/ogeece/ch1_index.htm

This guide provides information about how to choose and purchase equipment for large buildings such as lighting, heating, ventilating, air-conditioning, and motors.



Ontario Conserves Energy Conservation Guide
http://www.ontarioconserves.gov.on.ca/english/conservation_guide.pdf

This guide discusses energy conservation measures for Ontarians.

7.0 Links to Further Information



Air Quality Ontario

<http://www.airqualityontario.com>

The Government of Ontario's Air Quality Web Site



American Council for an Energy-Efficient Economy

<http://www.aceee.org/index.htm>

The American Council for an Energy-Efficient Economy is a nonprofit organization dedicated to advancing energy efficiency as a means of promoting both economic prosperity and environmental protection.



Canada's One-Tonne Challenge

<http://www.climatechange.gc.ca/onetonne>

The One-Tonne Challenge asks you to reduce your annual greenhouse gas (GHG) emissions by one tonne.



Climate Change Website (Government of Canada)

<http://climatechange.gc.ca/english/index.html>

Provides information on what governments are doing nationally and internationally about climate change.



Conservation Council of Ontario Buy Green Program

<http://www.greenontario.org/buygreen>

The Conservation Council of Ontario is a non-government, charitable organization with a mandate to promote cooperation for conservation and a healthy environment in Ontario, Canada. The following web site provides information on greening procurement policies and links to numerous other lists of green products.



Environment Canada's Green Lane

<http://www.ec.gc.ca>

Environmental news, publications, newsletters, and information on pollution and climate change.



Environmental Building News

<http://www.buildinggreen.com/index.html>

An independent company committed to providing accurate, unbiased, and timely information designed to help building-industry professionals and policy makers improve the environmental performance, and reduce the adverse impacts, of buildings.



Environmental Choice Program and EcoLogo

<http://www.environmentalchoice.com>

Encourages the supply of products and services that are more environmentally responsible and offers help for consumers and organizations buying "green." EcoLogo products and services are third-party verified and certified environmentally responsible.



Fraser Basin Council Greenhouse Gas Action Guide

<http://www.ghgactionguide.ca>

This website has been developed to assist municipalities, regional districts, and First Nations communities in undertaking immediate actions to reduce Greenhouse Gases. The challenge for many is where to start or, if some actions have already been taken, what more can be done. Recognizing that many communities have limited resources, the GHG Action Guide includes an extensive compilation of practical, straightforward, and cost effective actions to reduce harmful emissions. Topics range from transportation and infrastructure to water and waste. The Guide also describes ways to adapt existing practices that can be implemented through tools that are already available to local governments, and identifies resources (organizations, programs, and funding) available to help them accomplish their goals.



Government of Manitoba - Green Procurement

<http://www.gov.mb.ca/gs/psb/green.html>

The Government of Manitoba's Procurement Council established to address procurement related initiatives and lead the roll-out of "green purchasing" in government.



Greater Toronto Area Clean Air Council

<http://www.cleanairpartnership.org/gtacac>

The Greater Toronto Area Clean Air Council (GTA-CAC) is an inter-governmental working group that promotes the reduction of air pollution emissions and increased awareness of regional air quality issues in the Greater Toronto Area through the collective efforts of all levels of government. Our members include all levels of government in the Greater Toronto Area and beyond.



Green Public Procurement Handbook (Italy)

<http://www.provincia.cremona.it/servizi/ambiente/gppnet/en/fatto/>
<http://www.resourcesaver.org/file/toolmanager/CustomO16C45F53045.pdf>

The GPP Handbook is designed to help local Italian authorities integrate environmental considerations into their purchasing activities. It contains the essential environmental criteria for 189 goods commonly acquired by public authorities and, in most cases, one can cut and paste these criteria into calls for tender and service contracts in order to buy green.



Green Biz - Procurement Resources

<http://www.greenbiz.com/resources/procurement/index.cfm>

A nonprofit, non-partisan organization providing environmental information, resources, and tools to help the mainstream business community integrate environmental responsibility into their operations in a manner that combines ecological sustainability with profitable business practices.



The International Initiative for a Sustainable Built Environment

<http://www.greenbuilding.ca>

IISBE is an international non-profit organization whose overall aim is to actively facilitate and promote the adoption of policies, methods, and tools to accelerate the movement towards a global sustainable built environment.



International Institute for Sustainable Development - Business & Sustainable Development - Tools - Green Procurement

http://www.bsdglobal.com/tools/bt_green_pro.asp

The International Institute for Sustainable Development contributes to sustainable development by advancing policy recommendations on international trade and investment, economic policy, climate change, measurement and indicators, and natural resources management.



Manitoba Product Stewardship Corporation

<http://www.mpsc.com>

MPSC is an independent, non-profit organization representing the interest of all sectors of Manitoba, including consumers, industry, municipalities, and governments.



Natural Resources Canada Office of Energy Efficiency

<http://oee.nrcan.gc.ca/english/index.cfm>

The Office of Energy Efficiency (OEE), Canada's centre of excellence for energy

efficiency and alternative fuels information, is playing a dynamic leadership role in helping Canadians save millions of dollars in energy costs while addressing the challenges of climate change.



Natural Resources Canada Energy Office of Energy Efficiency Innovators Initiative: Commercial and Institutional Building Retrofits

<http://oee.nrcan.gc.ca/eii/home.cfm>

Natural Resources Canada's Office of Energy Efficiency (OEE) wants to help your organization lower energy costs and reduce greenhouse gas emissions that contribute to climate change. The Energy Innovators Initiative (EII) encourages commercial businesses and public institutions to invest in existing buildings. After you join, an EII staff person is assigned to work with you to deliver financial and other assistance.



Natural Resources Canada Energy Office of Energy Efficiency Commercial Buildings

http://oee.nrcan.gc.ca/english/b_com_inst/index.cfm

Tools, services, and financial incentives for commercial and Institutional buildings leading in improving energy efficiency.



Natural Resources Canada Energy Office of Energy Efficiency Purchasing Energy-efficient Equipment

<http://oee.nrcan.gc.ca/energystar/english/consumers/office.cfm>

Information, tools, and resources for purchasing energy-efficient office equipment.



Northeast Recycling Council - Green Purchasing on the Net

<http://www.nerc.org/gpn/index.html>

The "Green Purchasing on the Net" website aimed at helping professionals involved in promoting and expanding the procurement of environmentally preferable products to locate useful Internet based information resources on all aspects of green purchasing with a special emphasis on those products that contribute to increased pollution prevention, recycling and waste reduction.



Ontario Energy Board Factsheet: Regulated Price Plan

http://www.oeb.gov.on.ca/html/en/communications/fs_rpp.htm

Information about the Ontario Energy Board's Regulated Price Plan, a plan designed to make sure that prices consumers pay for the electricity they use better reflects the prices paid to electricity generators.



Ontario Ministry of Energy Glossary of Conservation Terms

<http://www.energy.gov.on.ca/index.cfm?fuseaction=conservation.glossary>

An online glossary of energy and conservation terms.



Ontario Environment Business Directory

<http://www.envirodirectory.on.ca/>

A searchable online directory of Ontario suppliers of environmentally friendly goods and services.



United Nations Environment Program - Sustainable Procurement

<http://www.unep.org/pc/sustain/design/green-proc.htm>

UNEP's web site promoting sustainable procurement.



United States Energy Glossary, Energy Definitions, Terms

http://www.eia.doe.gov/glossary/glossary_main_page.htm

An online glossary of energy terms from the U.S. Energy Information Administration.



United States Environmental Protection Agency ENERGY STAR

<http://www.energystar.gov>

The U.S. Environmental Protection Agency's ENERGY STAR government-backed program that helps businesses and individuals protect the environment through superior energy efficiency.



United States Environmental Protection Agency ENERGY STAR Savings Calculators

http://www.energystar.gov/index.cfm?c=bulk_purchasing.bus_purchasing

The U.S. Environmental Protection Agency's ENERGY STAR savings calculators provided to help organizations calculate their potential energy savings.



U.S. Environmental Protection Agency - Environmentally Preferable Purchasing

<http://www.epa.gov/oppt/epp/>


The U.S. Environmental Protection Agency Environmentally Preferable Purchasing website.

Appendix 1: City and Municipal Web Pages

The following links are provided to help you find energy procurement related resources on the web sites of the North America's largest cities and municipalities.

Town of Ajax, Ontario	http://www.townofajax.com
Boston, Massachusetts	http://www.cityofboston.gov
Brampton, Ontario	http://www.city.brampton.on.ca
Burlington, Ontario	http://www.city.burlington.on.ca
Town of Caledon, Ontario	http://www.town.caledon.on.ca
Calgary, Alberta	http://www.calgary.ca
Chicago, Illinois	http://egov.cityofchicago.org
Dallas, Texas	http://www.dallascityhall.com
Detroit, Michigan	http://www.ci.detroit.mi.us
Edmonton, Alberta	http://www.edmonton.ca
Halifax, Nova Scotia	http://www.halifax.ca
Houston, Texas	http://www.houstontx.gov
Los Angeles, California	http://www.lacity.org
Town of Markham, Ontario	http://www.city.markham.on.ca
Mississauga, Ontario	http://www.city.mississauga.on.ca
Montreal, Quebec	http://www2.ville.montreal.qc.ca
Municipality of Clarington, Ontario	http://www.clarington.net
New York City, New York	http://www.nyc.gov
Town of Newmarket, Ontario	http://www.town.newmarket.on.ca
Town of Oakville, Ontario	http://www.town.oakville.on.ca
Oshawa, Ontario	http://www.oshawa.ca
Ottawa, Ontario	http://www.ottawa.ca
Philadelphia, Pennsylvania	http://www.phila.gov
Phoenix, Arizona	http://www.ci.phoenix.az.us
Pickering, Ontario	http://www.cityofpickering.com
Regina, Saskatchewan	http://www.regina.ca
Region of Durham, Ontario	http://www.region.durham.on.ca
Region of Halton, Ontario	http://www.region.halton.on.ca
Region of Peel, Ontario	http://www.region.peel.on.ca
Region of York, Ontario	http://www.region.york.on.ca
Town of Richmond Hill, Ontario	http://www.town.richmond-hill.on.ca
San Antonio, Texas	http://www.sanantonio.gov
San Diego, California	http://www.sandiego.gov
Seattle Washington	http://www.ci.seattle.wa.us
Surrey, British Columbia	http://www.city.surrey.bc.ca
Toronto, Ontario	http://www.toronto.ca
Township of King, Ontario	http://www.township.king.on.ca
Vancouver, British Columbia	http://vancouver.ca
Vaughan, Ontario	http://www.city.vaughan.on.ca
Victoria, British Columbia	http://city.victoria.bc.ca
Town of Whitby, Ontario	http://www.whitby.ca
Winnipeg, Manitoba	http://www.winnipeg.ca

Appendix 2: Selected Energy Glossary

AFUE	Annual Fuel Utilization Efficiency – a measure of a gas or oil furnace's heating efficiency in converting fuel to energy - the higher the rating , the more efficient the unit.
COP	Coefficient of Performance - a measure of heating efficiency
cfm	cubic feet per minute - in this toolkit, cfm refers to the volume of air effected by a heating, ventilating or air conditioning product 1 cubic foot per minute = 0.000471947443 m ³ per second
EER	Energy Efficiency Ratio - a measure of cooling efficiency for cooling products. The higher the number, the less energy the system uses.
HSPF	Heating Seasonal Performance Factor – a measure of seasonal or annual efficiency of a heat pump. The measure is the ratio of useful energy output of a device to the energy input, averaged over an entire heating season
SEER	Seasonal Energy Efficiency Ratio – a measure of cooling efficiency for cooling products. The higher the number, the less energy the system uses
<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 20px;">  </div> <div> <p>Ontario Ministry of Energy Glossary of Conservation Terms http://www.energy.gov.on.ca/index.cfm?fuseaction=conservation.glossary</p> <p>United States Energy Information Administration Energy Glossary http://www.eia.doe.gov/glossary/glossary_main_page.htm</p> </div> </div>	

Appendix 3: Energy Management Consultants



The following firms are listed as Qualified Bidders that are involved in energy audits and energy retrofit projects for Federal Government buildings. Your municipality may also have other energy management consultants you have worked with in the past.

Listed firms can supply a full range of energy management services. For more information, see: http://oee.nrcan.gc.ca/fbi/bidders_list.cfm?

Ameresco Canada Inc.	http://www.ameresco.com
Cinergy Solutions – Demand, Ltd.	http://www.cinergy-solutions.com
Dessau-Soprin Inc.	http://www.dessausoprin.com
Direct Energy Business Services	http://www.directenergy.com
Ecosystem	http://www.ecosystem.ca
Groupe HBA experts -conseils S.E.N.C.	http://www.groupehba.com
Honeywell Limited	http://www.honeywell.com
Johnson Controls L.P.	http://www.johnsoncontrols.com
MCW Custom Energy Solutions Ltd.	http://www.mcw-ers.com
Poly-énergie Inc.	http://www.poly-energie.com
Siemens Building Technologies Ltd.	http://www.siemens.com

Appendix 4: List of ENERGY STAR Participants in Canada

To find the most up to date information on participants in the ENERGY STAR® initiative, including manufacturers and retailers, please see the following web sites:

Office of Energy Efficiency - ENERGY STAR - Who's on Board?

http://oee.nrcan.gc.ca/energystar/english/participants/onboard_part.cfm

ENERGY STAR Partner Results (US Program with Canadian Listings)

http://www.energystar.gov/index.cfm?fuseaction=estar_partner_list.showPartnerResults&s_code=ALL&partner_type_id=ALL&cntry_code=CA

Appendix 5: Sample Procurement Language



The Sample Procurement Language in the following section is provided to help you develop your procurement documents. Please note that the examples are taken from the Office of Energy Efficiency (OEE) web site and are subject to change. Therefore, when developing or revising your procurement documents, be sure to check the OEE Web site for the most complete and up-to-date information on product specifications and procurement language.

For more information, see:

<http://oee.nrcan.gc.ca/energystar/english/participants/procure.cfm>

Sample Procurement Language for Photocopiers

The text below from the ENERGY STAR[®] web site is provided as an example of ENERGY STAR procurement language that you can incorporate into your procurement policies.

The vendor shall:

- Provide copiers that meet the ENERGY STAR guidelines for energy efficiency.
- Provide copiers able to shut off automatically after a specified period of inactivity.
- Ship medium- and high-speed standard-sized copiers with a duplex capability that is set at the default mode. By making more double-sided copies, consumers can decrease paper consumption, save money and help prevent air pollution.
- Ship copiers with the power-management features enabled. The vendor shall ship medium and high-speed copier models with the default time for the low-power mode set at 15 minutes. For the auto-off feature, the vendor shall ship copier models set to the levels specified.
- Provide instruction on equipment operation and maintenance, including information on ENERGY STAR features. Any education and training provided by the vendor shall include information on all energy-saving features of each copier, including energy efficiency modes and their operation, duplex operations and double-sided default programming.

(Table adapted from <http://oee.nrcan.gc.ca/energystar/english/participants/procurement/copiers.cfm>)

Sample Procurement Language for Computers



The text below from the ENERGY STAR® web site is provided as an example of ENERGY STAR procurement language that you can incorporate into your procurement policies to ensure that you receive ENERGY STAR qualified computers. As with all purchases, be sure to ask the appropriate questions to ensure that you get exactly what you want.

The vendor shall:

- Deliver new and repaired machines configured properly for automatic energy-saving features as per the current ENERGY STAR specifications.
- Provide customer support with respect to power-management features such that these features remain properly enabled.
- Provide computers that will include one or more mechanisms through which they can activate the low-power modes of an ENERGY STAR qualified monitor.
- Provide integrated systems, where the laptop computer and the monitor are combined in a single unit that will enter a low-power mode of no more than 45 W after a specified period of inactivity.
- Provide computers in low-power mode that will automatically return to active mode upon resumption of system activity or receipt of external input
- Ship computers with the power-management feature enabled. To ensure that the maximum number of users take advantage of the low-power "sleep" mode, vendors shall ship their computers with the power-management feature enabled. The default time shall be preset for less than 30 minutes.
- Provide ENERGY STAR qualified computers that are configured so that they automatically enter a low-power mode after a period of inactivity.

(Table adapted from <http://oee.rncan.gc.ca/energystar/english/participants/procurement/computers.cfm>)

Sample Procurement Language for Computer Monitors



The text below from the ENERGY STAR® web site is provided as an example of ENERGY STAR procurement language that you can incorporate into your procurement policies to ensure that you receive ENERGY STAR qualified computer monitors. As with all purchases, be sure to ask the appropriate questions to ensure that you get exactly what you want.

The vendor shall:

- Provide ENERGY STAR qualified monitors that automatically have the capability to enter two successive low-power modes.
- In the first low-power "sleep" mode, the monitor shall consume 15 W or less within 30 minutes of inactivity. If the monitor continues to be idle for a total of 60 minutes, the CPU will instruct it to enter a second low-power "deep sleep" mode.
- In the second low-power mode shall consume 8 W of electricity or less.
- Provide any software required to initiate a monitor's low-power modes with the monitor. The user shall have the ability to change the time settings or disable the low-power modes if needed. Upon resumption of user activity, the monitor shall automatically return to full operational capability.

(Table adapted from <http://oee.rncan.gc.ca/energystar/english/participants/procurement/computers.cfm>)

Sample Procurement Language for Compact Fluorescent Lamps (CFLs)



You may wish to use the following procurement language in contracts to ensure you receive ENERGY STAR® qualified CFLs. As with all purchases, be sure to ask the appropriate questions to ensure that you get exactly what you want.

The vendor shall

- Provide compact fluorescent lamps and lamp systems that meet ENERGY STAR specifications for energy efficiency (see specifications in table in the Selection Criteria section above).
- Verify that the compact fluorescent lamps and lamp systems have been ENERGY STAR qualified. To help, participant lists and qualified product lists are available on the Web site at <http://oee.nrcan.gc.ca/energystar>

General Wattage Equivalency Guide to Replacing Incandescent With CFL Bulbs:

CFL (watts)	Equivalent Incandescent
14	40
20	60
25	75
32	100
50	150

Sample Procurement Language for Exit Signs



You may wish to use the following procurement language in contracts to ensure you receive ENERGY STAR[®] qualified exit signs. As with all purchases, be sure to ask the appropriate questions to ensure that you get exactly what you want.

The vendor shall

- Provide exit signs that meet ENERGY STAR specifications for energy efficiency. For ENERGY STAR labelled exit sign guidelines, see table in Specifications section (above).

(Table adapted from <http://oee.nrcan.gc.ca/energystar/english/participants/procurement/exitsigns.cfm>)

Sample Procurement Language for Traffic Signals



You may wish to use the following procurement language in contracts to ensure you receive ENERGY STAR[®] qualified traffic signals. As with all purchases, be sure to ask the appropriate questions to ensure that you get exactly what you want.

The vendor shall

- Provide traffic signal units that meet ENERGY STAR specifications for energy efficiency. For the criteria for energy-efficient traffic signals, refer to the table above.

(Table adapted from <http://oee.nrcan.gc.ca/energystar/english/participants/procurement/traffic.cfm>)

Green Procurement Language



Finally, consider the following sample “Green” Procurement Language for a Municipal Procurement Policy

ENVIRONMENTALLY FRIENDLY PRODUCTS & SERVICES

The purchase of environmentally-responsible products and services will be considered at all times. These products and services are defined as those having a lesser or reduced effect on human health and the environment when compared to other products and services that serve the same purpose.

Specifications will include, unless otherwise justified, environmentally-responsible products and services that use environmentally-responsible practices and that:

- use recycled materials; are durable, reusable or are designed to be recycled;
- consume fewer resources in their manufacture and/or their use;

(Thanks to Kim Dooling from Oakville for providing this example of green procurement policy)

Endnotes

- ¹ Natural Resources Canada, 2005. *The International ENERGY STAR® Symbol*. Accessed 9 February 2005 from <http://oee.nrcan.gc.ca/energystar/english/consumers/index.cfm>
- ² United States Environmental Protection Agency, 2005. *What is ENERGY STAR®?* Accessed 23 June 2005 from http://www.energystar.gov/index.cfm?c=about.ab_index
- ³ For a full report about ENERGY STAR® in the last decade, see: http://www.energystar.gov/ia/partners/downloads/energy_star_report_aug_2003.pdf
- ⁴ Natural Resources Canada, 2005. *ENERGY STAR® General FAQs*. Accessed 16 February 2005 from <http://oee.nrcan.gc.ca/energystar/english/participants/faq.cfm?>
- ⁵ Ibid.
- ⁶ Natural Resources Canada, 2004. *EnerGuide For Industry*. Accessed 16 April 2005 from <http://oee.nrcan.gc.ca/egi/english/index.cfm?>
- ⁷ United States Energy Information Administration, 1998. *Emissions of Greenhouse Gases in the United States 1998 - Executive Summary*. Accessed 2 April 2005 from <http://www.eia.doe.gov/oiaf/1605/gg99rpt/index.html>
- ⁸ Natural Resources Canada, 2005. *The International ENERGY STAR® Symbol*. Accessed 9 February 2005 from <http://oee.nrcan.gc.ca/energystar/english/consumers/index.cfm>
- ⁹ Federation of Canadian Municipalities, 2000. *Municipal Leaders' Statement on Climate Change*. Accessed 13 August 2005 from <http://www.fcm.ca/pcp/climateres-e.html>
- ¹⁰ Government of Ontario, 2004. *Ontario Conserves*. Accessed 16 March 2005 from http://www.ontarioconserves.gov.on.ca/english/conservation_guide.pdf
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- ¹² Natural Resources Canada, 2005. *ENERGY STAR® and Office Equipment*. Accessed 23 June 2005 from <http://oee.nrcan.gc.ca/energystar/english/participants/energystar-office-equipment.cfm?>
- ¹³ United States Environmental Protection Agency, 2005. *What is ENERGY STAR®?* Accessed 23 June 2005 from http://www.energystar.gov/index.cfm?c=about.ab_index
- ¹⁴ United States Environmental Protection Agency, 2005. *ENERGY STAR® For Commercial Real Estate*. Accessed 24 April 2005 from http://www.energystar.gov/index.cfm?c=comm_real_estate.bus_comm_realestate
- ¹⁵ Suozzo, 2005. *Energy-Efficient Office Equipment*. Accessed 14 February 2005 from <http://www.aceee.org/press/op-eds/OP-ED4.HTM>
- ¹⁶ Natural Resources Canada, 2005. *An Energy Smart Office*. Accessed 14 February 2005 from <http://oee.nrcan.gc.ca/energystar/english/participants/energystar-office-equipment.cfm?>
- ¹⁷ Natural Resources Canada, 2005. *ENERGY STAR® - Office Equipment*. Accessed 16 February 2005 from <http://oee.nrcan.gc.ca/energystar/english/consumers/office.cfm?>

- ¹⁸ United States Environmental Protection Agency, 2005. *Copiers*. Accessed 23 April 2005 from http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CP
- ¹⁹ International Energy Agency, 2000. *Copier of the Future Technology Procurement Project Documentation*. Accessed 14 March 2005 from http://www.energystar.gov/ia/products/ofc equip/copiers/Copier_Procurement.pdf
- ²⁰ United States Environmental Protection Agency, 2005. *Copiers*. Accessed 23 April 2005 from http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CP
- ²¹ Ontario Ministry of Energy, 2005. *Saving Energy for Small Business*. Accessed 2 April 2005 from <http://www.energy.gov.on.ca/index.cfm?fuseaction=conservation.smallbusiness>
- ²² European Commission, 2005. *Desktop vs Laptop*. Accessed 15 March 2005 from http://www.eu-energystar.org/en/en_022.htm
- ²³ United States Environmental Protection Agency, 2005. *Laptops*. Accessed 23 April 2005 from http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=LT
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- ²⁶ Ontario Ministry of Energy, 2005. *Energy Saving Tips - Home and Home Office*. Accessed 2 April 2005 from http://www.energy.gov.on.ca/index.cfm?fuseaction=conservation.tips_home
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- ²⁸ United States Environmental Protection Agency, 2005. *Success Story: Empire Bolt + Screw*. Accessed 23 April 2005 from http://www.energystar.gov/index.cfm?c=sb_success.sb_successstories_empire
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- ³⁰ City of Vancouver, 2004. *City of Vancouver Energy Efficiency Purchasing Policy*. Accessed 14 May 2005 from <http://vancouver.ca/ctyclerk/cclerk/20041102/p1.htm>
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- ³³ City of Mississauga, 2004. *FYI - New Traffic Lights Signal Early Savings*. Accessed 15 May 2005 from http://www.mississauga.ca/portal/home?paf_gear_id=9700020&itemId=18800014
- ³⁴ Natural Resources Canada, 2005. *CFB Halifax's Energy Performance Contract*. Accessed 25 February 2005 from <http://oee.nrcan.gc.ca/publications/infosource/pub/ici/eii/M27-01-1064E.cfm?>

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