

Environmental Awareness Tool Kit

Welcome to the Environmental Awareness Tool Kit

This Tool Kit is your source for environmental information related to Green Procurement. Whether you're trying to get general information on environmental issues or you're developing specifications for environmentally preferable goods and services, you'll find helpful information and links here.

1. Key Environmental Issues and Green Procurement
2. Green Procurement Principles
3. Developing Green Procurement Specifications
4. Green Procurement Checklist
5. Environmental Product Terminology
6. Green Product Certification Programs & Standards
7. Links to:
 - o Green Procurement Purchasing Guides
 - o Green Procurement Tools
 - o OGGO Green Procurement Publications
 - o Government Resources
 - o Government Programs
 - o Government Policies and Legislation
 - o International Sources of Information

Key Environmental Issues and Green Procurement

Connect to these links to find descriptions of specific environmental issues and how green procurement can be used to lessen the environmental impact of the goods and services selected by the Government of Canada.

1. Greenhouse gases and global warming
2. Resource efficiency
3. Ozone: the ozone layer and ozone depleting substances
4. Solid waste and the 3R's (Reduce, Reuse, Recycle)
5. Hazardous waste
6. Sustainable development
7. Renewable energy sources and fossil fuels



Greenhouse gases and global warming

Greenhouse gases (GhGs) include any of the atmospheric gases that contribute to the 'greenhouse effect'. The greenhouse effect is the trapping of heat within the earth's atmosphere, by these gases, which include carbon dioxide, (CO₂), methane (CH₄), nitrous oxide (N₂O), and ozone (O₃). Emissions of these gases and accumulation in the atmosphere are accelerated by human activities, such as the burning of fossil fuels (oil, gas, coal, etc.). In addition, manmade chemicals, such as halogenated fluorocarbons (HCFCs), perfluorinated carbons (PFCs), and hydrofluorocarbons (HFCs) act as greenhouse gases when released through the use of consumer and industrial goods. As greenhouse gases accumulate in the atmosphere, they contribute to global warming.

An analysis of temperature records shows that the Earth has warmed an average of 0.5°C over the past 100 years. Global warming is directly linked to climate change, which is defined as a shift in weather patterns. Major concerns associated with climate change include increased frequency of severe weather events (hurricanes, tornadoes, flooding, drought, etc.), shifting/loss of species habitat, and disruption to critical human activities such as farming. The reduction in emissions of these gases is therefore being targeted to prevent/reduce ongoing global warming.

How can Green Procurement help to reduce greenhouse gas emissions?

Products and services that burn less fuel or consume less energy can claim that they have lower GhG emissions. The claim can be verified by looking at the product's or service's total fuel consumption, compared to its competitors. Some examples include

- A vehicle that has better fuel efficiency, burns less fuel per km driven and therefore emits less greenhouse gases than a lower efficiency vehicle.
- The less electricity an appliance uses, the lower the demand on power-generating stations, which generate GhGs when they burn fossil fuels to produce electricity.
- The better insulated a building is, the less heat is lost to the exterior and therefore the less fuel burned to maintain comfortable temperatures. As a result, the building will cause lower emissions of greenhouse gases than one that is poorly insulated.
- [Stern Review on the Economics of Climate Change](#) 
- [Tufts University Climate Initiative](#) 

Resource efficiency

Resources include raw materials such as timber, minerals and metals, water and energy sources. Resource efficiency means using these materials in the most productive and economical way possible, keeping quantities consumed and waste to a minimum. Ideally an item should be resource-efficient throughout its life – from design and manufacture through to use and disposal. The resources consumed by a product during its life are an important issue because this impacts the burden of human activity on the environment.

Resource efficiency is an environmental priority because resources are dwindling, while world population continues to grow and place more demands on those same resources. According to the Worldwatch Institute's State of the World 2004 report, "Between 1850 and 1970, the number of people living on Earth more than tripled and the energy they consumed rose 12-fold. By 2002, our numbers had grown another 68 percent and fossil fuel consumption was up another 73 percent." Similarly, water consumption has grown dramatically. "The world's population used three times as much water in 1995 as it did in 1950, while the supply of water per capita in 1994 was only one third of what it was in 1970" (A Fork in the Road, D. Wilson, Sept 2004). The need to reduce energy and water consumption is clear from these statistics.

How can Green Procurement support resource efficiency?

When assessing resource efficiency, consider elements such as:

- energy consumption during delivery
- use/maintenance and disposal
- features that reduce energy, fuel or water use
- capacity of product (e.g., is it larger than necessary to meet the need?)
- waste generation during use, and
- quantity of packaging.

Informed procurement decisions can facilitate the reduction of energy consumption and save money. NRCan's Office of Energy Efficiency cites the following example:

Example:

Table 1 below shows how much energy and money an office of 200 employees could expect to save under normal operating conditions, as well as the potential savings in GHG emissions, by selecting ENERGY STAR equipment over conventional equipment. ENERGY STAR labeled equipment typically costs no more to purchase than conventional equipment with the same operating features and capacity.

Table 1: Energy Savings associated with ENERGY STAR Office Equipment				
Type of Equipment	Annual Energy Cost Savings by Using ENERGY STAR Qualified Equipment (\$)	Lifetime Energy Cost Savings by Using ENERGY STAR Qualified Equipment (\$) †	Lifetime Energy Savings by Using ENERGY STAR Qualified Equipment (kW/h)	Lifetime Greenhouse Gas Savings by Using ENERGY STAR Qualified Equipment (kg of carbon dioxide equivalent)
Personal Computers/ Monitors(180)	2,877	9,122	114,999	62,329
Laser Printers (18)	324	1,413	19,444	10,539
Totals	\$3,201	\$10,535	134,443 kW/h	72,868 kg CO₂

Calculations were based on \$0.10/kWh.

†Assumed product lifetime is 4 years for personal computers/monitors, 6 years for laser printers

Web link

- [NRCan ENERGY STAR Simple Savings Calculator](#)

Ozone layer and ozone depleting substances

The ozone (O₃) layer protects the Earth against UV radiation. A class of chemicals known as halocarbons, are used in packaging, foam, and as solvents, propellants and refrigerants. They are particularly harmful to the ozone layer, interacting with and destroying it. This allows harmful UV radiation to pass through to the Earth's surface. For example, increasing skin cancer rates are attributed to a thinner ozone layer.

How can Green Procurement help to reduce the use of ozone-depleting substances?

The US EPA maintains a list of ozone-depleting substances. Products that do not contain these substances should be considered preferable to those that do. It's important to note that replacements do exist. For example, hydrocarbons can be used as a refrigerant, instead of halocarbons.

Web link

- [EPA Government list of ozone depleting substances](#) 

Solid waste and the 3R's (Reduce, Reuse, Recycle)

Solid waste can be broadly defined as materials discarded from industrial, commercial, mining, or agricultural operations, and from community activities. It can include garbage, construction debris, commercial refuse, sludge from water supply or waste treatment plants, or air pollution control facilities, and other discarded materials.

Waste diversion is a practice that reduces the flow of solid waste to landfill. The Federation of Canadian Municipalities describes the following waste diversion actions:

- Reuse: using the material in its same form. This activity is generally internal to the business or the residence that is the source of the solid waste.
- Recycling: a material is considered to be recycled if it has been subjected to an appropriate level of processing related to the specifications for the intended use. The resulting products will have value as commodities. Recycling typically refers to the recovery of dry materials, paper, plastics, glass and metals from the waste stream for incorporating into new uses.

How can Green Procurement help to reduce solid waste?

By applying the 3Rs principle, green procurement can result in reduction of material consumed, reuse of old material and recycling of spent materials. All of these actions divert solid waste away from the landfill. At the same time, significant energy savings can be realized by reprocessing waste materials instead of extracting virgin raw materials.

Web links

- [Waste Diversion Ontario](#) 
- [Federation of Canadian Municipalities – Green Municipal Fund](#) 

Hazardous materials and waste

"Hazardous" materials are considered dangerous to human health. They may be, for example, known cancer-causing agents, poisonous, toxic, highly flammable, or explosive. Hazardous materials can be used for many purposes and within many products, including cleaners, solvents, flame retardants in furniture and carpeting, lighting, electronic equipment – the list goes on. However, improper handling, use or disposal can lead to human or environmental exposure with associated health consequences. Off-gassing from furnishings can diminish indoor air quality. Improperly disposed of electronic equipment can result in the leaching of heavy metals into groundwater. Spills of stored hazardous chemicals can expose workers, contaminate soil and affect groundwater quality.

Legally, hazardous materials are defined in Canada by the Workplace Hazardous Materials Information System (WHMIS) and the Transportation of Dangerous Goods (TDG) Act. Items deemed hazardous include, among others, heavy metals, solvents, acids, corrosives, and explosives. The *Canadian Environmental Protection Act (CEPA)* outlines rules for sound management of hazardous waste and hazardous recyclable material, the legal and illegal export and import of hazardous waste, priority substance assessments and the development of risk management controls.

The Hazardous Products Act and the Consumer Packaging and Labeling Act regulate the labeling of consumer products, for use in both industrial settings and by consumer households. Consumer products that can pose a safety risk are marked as being flammable, corrosive, poisonous or explosive.

How can Green Procurement help to reduce hazardous material usage?

Product specifications should be checked for hazardous material content. By identifying goods that contain little or no hazardous material, green procurement can provide an opportunity to minimize the use of hazardous materials and the generation of waste containing hazardous materials. Where avoidance of hazardous material is not feasible, appropriate use and disposal arrangements must exist, to ensure that the item can be safely used and discarded.

Web links

- [Workplace Hazardous Materials Information System \(WHMIS\)](#)
- [Transportation of Dangerous Goods Act](#)
- [Hazardous Products Act](#)
- [Canadian Environmental Protection Act, 1999](#)
- [Consumer Packaging and Labeling Act](#)
- [Federation of Canadian Municipalities – Green Municipal Fund](#) 
- [Waste Diversion Ontario](#) 

Sustainable Development

The World Commission on Environment and Development (the Brundtland Commission) defined sustainable development (SD) as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." In other words, while development is essential to satisfy human needs and improve the quality of human life, it must be based on the efficient and environmentally responsible use of all of society's scarce resources - natural, human, and economic. Sustainable development has become a key goal of public policy both domestically and internationally over the last decade.

How can Green Procurement help to support sustainable development?

The principles of Green Procurement are consistent with the objectives of Sustainable Development. Selecting environmentally preferable product supports the efficient and environmentally responsible use of resources.

Web link

- [Brundtland Commission](#) 

Renewable energy sources and fossil fuels

Fossil fuels, such as gas, oil, and coal have traditionally provided power to meet the world's energy needs for heat, cooling, lighting, and powering of industrial processes. Fossil fuel is burned and the resulting heat used to generate steam that spins turbines, which generate power. This process also releases air pollutants (sulphur dioxides, nitrogen oxides, mercury) and carbon dioxide (CO₂), which contribute to haze, smog, acid rain, mercury accumulation in fish, and climate change. Fossil fuel powered electricity generation accounts for 22% of Canada's national carbon dioxide emissions (CEC, 2002), a key contributor to global warming and climate change. As global reserves of fossil fuels are depleted, there is also a long term concern over the cost and availability of this type of power generation in the future. Renewable energy sources are increasingly being pursued as alternatives because they don't rely on fossil fuels and they produce very low amounts of pollutants and CO₂.

The best known renewable energy sources include wind, solar, geothermal and biomass. Hydroelectric power generation is also considered to be a renewable energy source.

- **Wind** power relies on wind to turn turbines that generate electricity.
- **Solar** technologies trap the heat of the sun using photovoltaic cells, and use it directly for heating or lighting, or store it to a battery for later use.
- **Geothermal** technologies exploit the Earth's natural thermal energy, to heat or cool buildings. The earth's natural heat is tapped by employing a series of underground pipes, called a loop, installed in the soil or submerged in a pond or lake. A fluid circulating in the loop absorbs the earth's heat in winter and carries it to the building. Inside Geothermal systems then concentrate the heat and release it at a higher temperature inside the building. In summer, the process is reversed, as excess heat is drawn from the building, expelled

to the loop and absorbed by the earth. Geothermal facilities can also generate electricity.

- **Biomass** energy involves the conversion of organic feedstocks, such as wood or peat, into useful forms of energy such as heat, electricity or liquid fuels. Biomass energy provides an attractive alternative to fossil fuels as biomass material is readily available and when properly managed, the resource is renewable and has little adverse environmental impact. Current research is focusing on biogas production, waste-to-energy conversion, gasification and pyrolysis, and ethanol fermentation technologies.

All of these renewable technologies generate considerably less pollution than conventional technologies that rely solely on the burning of fossil fuels. [Further information on renewable energy technologies.](#)

How can Green Procurement help to support the use and development of renewable energy?

Green procurement can support the development and growth of renewable energy technologies by considering the purchase of power from renewable energy sources, integrating renewable energy technologies, such as geothermal, into new building construction, and considering suppliers that use renewable energy in their production processes or when delivering services.

Web Link

- [NRCan - Renewable Energy Technology](#)

Green Procurement Principles

This section explains the fundamental principles of green procurement, including the manner it is applied in the four phases of the procurement process.

- Green Procurement Considerations in the Four Phases of Procurement
- Value for Money
- Total Life Cycle Analysis
- Total Life Cycle Costing

Green Procurement Considerations in the Four Phases of Procurement

There are numerous practical considerations to be made during each of the procurement phases – planning, acquisition, use/maintenance, and disposal - to ensure that environmental considerations are included in procurement decisions. Working with suppliers for continuous improvement is also an important element of furthering the Green Procurement initiative.

For a complete description of considerations to be made in each phase of the procurement process, consult OGGO's [Guideline for Integration of Environmental Performance Considerations in Federal Government Procurement.](#)

An overview of Green Procurement considerations in each phase, is provided here.

- Planning
- Acquisition
- Use/Maintenance
- Disposal

Additional related topics include:

- Packaging
- Continuous Improvement of Suppliers:

Green Procurement Considerations in the Planning Phase

The planning and requirement definition stage is where there is the greatest opportunity to consider environmental issues. It is at this stage that departments and agencies can plan the purchase of environmentally preferred goods and services as well as plan the management of how purchases are used, maintained and disposed.

Prior to establishing a specification, there is little in terms of policy, regulations or trade agreements that affect or limit the scope to take environmental performance considerations into account. It is usually the program managers, project authorities or other internal users who identify the need. It is essential that they work closely with the contracting authority to ensure that full advantage is taken to consider environmental issues at this stage, and in the subsequent development of specifications.

During the Planning phase, the following should be addressed:

- Take into account specific Green Procurement objectives established by the procuring Department
- Take the 3R's (Reduce, Reuse, Recycle) approach to the acquisition:
 - Reduce: Assess the need for a given purchase and, whenever possible, reduce consumption.
 - Reuse: Consider acquiring second-hand or used materiel (ensure that energy efficiency and other environmental considerations, as well as maintenance costs, are taken into consideration).
 - Recycle: Ensure that acquired goods and associated consumables can be recycled at end of life.
- Investigate the possibility of aggregating demand amongst multiple users, to achieve better usage of assets.
- Alternatives to acquisition can be considered, such as introducing service options to meet a need, rather than acquiring costly and resource-intensive capital items.
- Select options that are durable and therefore have a long service life or are economical to repair.
- Consider goods and/or services that are less damaging to the environment, such as those that (are):
 - made with resource-saving materials or processes (resource-efficient);

- made from renewable resources;
- reuseable or contains reuseable parts;
- recyclable or contain recycled materials (e.g, recycled paper, reconditioned laser printer cartridges, etc.);
- easily disassembled for recycling or reconditioning;
- consume less energy, fuel or water during the use phase (energy-efficient);
- generate minimal solid and/or hazardous waste during use and upon disposal;
- release less VOCs;
- contain no hazardous materials;
- identify opportunities to reduce the negative impact of packaging .
- Specify packaging requirements that are less damaging to the environment such as:
 - minimize packaging;
 - reuse or recycle packaging;
 - use return to vendor programs as alternates to waste disposal.

During the Planning Phase, conducting asset use studies can also be helpful to identify available capacity in existing assets or opportunities for rationalization. For example, vehicles may be purchased with the expectation that they will be driven for 20,000 km/year. In reality, a review of the fleet may reveal that vehicles are not fully utilized and that, in fact, the department could reduce its total fleet by 10% or 20% with little impact to travel efficiency.

Finally, an evaluation of the capacity of potential suppliers to respond to criteria for environmental performance should be made, in order to determine if such criteria should be incorporated into specifications.

- Are potential suppliers ISO 14001 certified?
- Can suppliers comply with proposed environmental specifications?
- Do suppliers have products that meet desired environmental standards or guidelines?
- Can the suppliers readily provide information on environmental attributes of products?

Further information on environmental [terminology](#) and [product specifications](#) can be consulted to assist in better understanding of the environmental considerations outlined above.

Green Procurement Considerations in the Acquisition Phase

Once a department identifies a specific need, the acquisition phase begins. This phase draws on the planning work previously completed, and proceeds to the preparation of solicitation documents, evaluation of bids, contract award and contract management.

Decisions taken as a result of the planning phase must be reflected in the solicitation and contract documents. A clear definition of the technical requirements including the environmental outcomes to be achieved, terms and conditions including

environmental terms such as use of certified recyclers, mandatory requirements and bid evaluation criteria, as applicable, as well as the contractor selection methodology, will permit the award of a contract that supports value for money propositions.

Acquisition within a Green Procurement context is subject to all of the standard procurement obligations associated with international and national trade agreements, the *Government Contracts Regulations*, as well as federal government procurement policies. The PWGSC *Basic Guidelines for Bid Evaluation and Process Contractor Selection Methods* provides a list of evaluation schemes and various selection methods as a guide for contracting authorities. The basic principles described in the guidelines for developing bid evaluation and contractor selection methodologies apply to environmental requirements, just as they apply to other considerations such as quality, price and performance of the goods and services being procured. A key point is that *all factors leading to the contractor selection must be clearly defined in the solicitation documentation*. Please note that these documents are made available to **Government Users Only** due to their commercial confidential nature.

Where relevant to the subject matter of the requirement, the solicitation can request information to support environmental criteria. Some examples include:

- Description of tools, work plans and technical equipment with less environmental impact;
- Environmental attributes of products, including features which result in lower environmental impact during use, maintenance, and disposal;
- Use of certification system labels (or equivalent) such as Ecologo, GreenSeal, etc.;
- Specification of measures taken to minimize, reuse or recycle packaging;
- Indication of environmental management measures;
- Past performance in fulfilling similar environmental requirements;
- Environmental Management Systems – evidence of environmental management measures that are relevant to the execution of the contract may be required.

The bidder whose proposal best meets the requirements as outlined in the solicitation documentation will be awarded the contract. Using a value for money approach, the definition of evaluation methodology will take into account total life cycle costs and environmental considerations, quality and performance, consistent with the published bid evaluation and contractor selection criteria.

Green Procurement Considerations in the Use/Maintenance Phase

With the introduction of the Policy on Green Procurement, greater attention is being paid to the responsible use and maintenance of the asset in the appropriate manner to ensure environmental benefits. Where appropriate, users of the asset need to be trained to ensure that the expected environmental benefits and life cycle cost savings are achieved. In other words, the actual conditions of use for the asset must be the same as the assumptions made in the life cycle analysis. For example:

- To recover the additional cost of a photocopier or printer with duplex printing features, users must save paper by using the duplex feature.
- To achieve the high fuel efficiency expected with hybrid vehicles, the vehicles should be chosen for use in situations where they perform best. Drivers also must be trained appropriately. For example:
 - Hybrid vehicles show the highest fuel savings relative to conventional vehicles when used for city driving as it maximizes the use of the electric motor.
- To achieve the greatest energy savings associated with 'power down' features on computers, settings must be adjusted to a level that puts the computer in 'sleep' mode after a brief time period.

Products must also be properly maintained and used, to extend the service life of a product. When economically feasible, equipment should be repaired, refinished and reused. There are many examples where this advice could be applied:

- the upgrading, rather than replacement, of computer equipment;
- proper maintenance of vehicles, i.e., proper tire inflation levels can improve fuel efficiency by five percent;
- electrostatic re-painting of filing cabinets, rather than replacement with new items; and
- use of warranties for repairs rather than replacement in furniture i.e. chairs

Green Procurement Considerations in the Disposal Phase

Disposal of the asset is a significant element in the life cycle analysis conducted during the Planning Phase. The actual mode of disposal must be consistent with choices made based on the analysis. Alternatives to be considered prior to outright disposal include:

- return-to-vendor,
- reuse,
- recovery/reclamation of components and hazardous materials, such as heavy metals,
- recycling of components or whole assets.

At the end of the life of the asset or acquired services that have no resale or trade-in value or cannot be donated, disposal should be carried out in the most environmentally responsible manner, including seeking opportunities to use waste minimization or waste diversion programs. Waste generation should be minimized to the greatest extent possible. Hazardous waste must be disposed of following appropriate regulations.

From an environmental perspective, there are some important aspects of the disposal phase to consider:

- A product can only be considered recyclable if local facilities exist for recycling. For example, in some cities, you cannot recycle foam, so foam packaging cannot be considered recyclable packaging in those jurisdictions.

- Look for suppliers that will take back their products for recycling. Many computer and imaging equipment suppliers will take back their products for reuse, or disassembly and recycling.
- Finding an alternative for a hazardous material has a significant cost benefit. Hazardous materials disposal costs are high and employees also require costly regular training to legally handle it.
- When disposing of hazardous waste, ensure that it is done correctly, with no environmental impact, to avoid costly remediation in the future.

In addition to environmental considerations, there are also regulatory issues to consider. The [Materiel Management Policy](#) provides direction on management of materiel assets, including some hazardous substances, through their lifecycle, including disposal. Treasury Board also provides direction on the [Disposal of Surplus Moveable Crown Assets](#).

Packaging – A Green Procurement Issue

Most goods come with some sort of packaging. Two major environmental concerns make packaging a green procurement issue:

1. Resource Consumption

Packaging consumes resources during production (raw materials), increases transportation costs (the larger the package, the fewer the units that make up a shipment) and must be disposed of (energy to dispose or recycle). It also increases solid waste. Packaging reduction reduces resource consumption throughout the product's life cycle and reduces waste.

2. Waste

Packaging makes up a significant portion of the waste stream. Every year, the average Canadian family is responsible for discarding one tonne of packaging waste.

Packaging reduction can be addressed through product and service specifications. Some vendors may not be keen to reduce packaging, because it serves multiple purposes:

- Damage control: packaging is designed to minimize damage due to movement. Demands to reduce packaging should be made with this in mind. Some packaging is also specifically designed to ensure a tight fit in a truck, an overseas crate or on a pallet.
- Marketing tools: large, coloured cardboard boxes can act as a moving billboard, helping to advertise a supplier's product.

The following section highlights solutions that can be applied to reduce the amount of packaging. This information will prove valuable when preparing specifications.

Solutions to Reduce Packaging

Use 'Take It Back' Programs

Suppliers may have programs whereby packaging can be returned and used items can be returned for reuse/refurbishing. For example:

- When installing a new toner cartridge, the old one can be packed in the box and returned to the supplier with the enclosed pre-paid courier label.
- Some computer manufacturers will collect old electronic waste for recycling and reclamation.
- In some jurisdictions, vendors selling hazardous materials such as motor oil provide a collection service that allows customers to return the containers for proper disposal.

Verify that the supplier's 'take it back' program appropriately deals with the waste and does not simply dispose of it on behalf of the customer.

Specify Vendor Action on Packaging

Whether it is delivery in reusable containers such as blankets or plastic totes, or vendor removal of all packaging materials for recycling, suppliers are usually keen to earn business by providing service as well as product. For example:

- Many major furniture manufacturers are serious about environmental issues and will help by suggesting ways in which packaging can be reduced.
- Office supply vendors are often happy to provide generic bulk packaging rather than the more expensive display packaging used for consumer goods. For example, bulk purchase of 100 highlighter pens would reduce packaging waste by a considerable amount.

Purchase in Bulk and/or Concentrate

Purchasing in bulk reduces cost and also cuts down on packaging waste. Dish detergent, cooking oil, sauces, cleaning agents, etc. can be purchased in large containers with smaller refillable bottles for carrying on daily use duties. For example, at the House of Commons the cleaning staff switched to small packets of concentrated cleaner. Each packet is enough for one bucket or bottle full of cleaner. This switch cut down on overuse dramatically and cut costs, but also cut down on packaging waste as well because the cleaners came in concentrate.

Set Up Reusable Packaging Programs with Repeat Suppliers

Many large companies are able to use reusable plastic totes for shipping goods. This type of program is usually only feasible with regular suppliers using their own transportation fleets.

Pallet Recycling Program

Many businesses across Canada participate in pallet reuse and recycling programs. Those who belong to the program use commonly purchased heavy-duty pallets to ship goods back and forth rather than cheap pallets made from low-grade lumber.

Pallets often get repaired, and replacement is the exception rather than the rule. Suppliers can join [Commonwealth Handling Equipment Pool](#) [www](#) or [Canadian Pallet Council](#) [www](#) or take back the empty pallets, where these programs are locally available.

Recycling Packaging

If packaging waste cannot be avoided, ensure that recycling facilities exist. For example, foam packaging is often thrown away. If foam cannot be avoided, check buildings for recycling of polystyrene (PS - plastic number 6) as it may be possible to dispose of foam packaging through such a program. The recycling coordinator for the building should be contacted in advance, to ensure that it can be handled and to ensure that there is a recycling facility nearby. Also consider that if there is no place to temporarily store the foam from a floor full of office equipment, it may still be sent to landfill.

Supplier Relationships: Continuous Improvement

There may be opportunities to work co-operatively with the supplier community to reduce the government's environmental impacts. Continuous improvement should be sought, particularly with long-term suppliers. Opportunities could include, for example, encouraging suppliers to:

- reduce packaging by looking at delivery frequency and scheduling;
- reduce the hazardous material content in products under development;
- specify that, where deliverables are reports, that they be printed or copied in double-sided format or sent electronically;
- use electronic communication wherever possible.

Value for Money

In support of program delivery to Canadians, government procurement strives to fulfill functional requirements by acquiring appropriate goods and services in the most efficient and economical manner possible. In short the goal is to obtain 'value for money'. The procurement process considers cost, product performance, product availability, quality and environmental attributes, in making procurement decisions. To achieve 'value for money', the procurement action must achieve the optimal balance of overall benefits, for a given expenditure.

A value for money approach to procurement means that the lowest upfront price will not automatically be preferred. All life cycle costs must be taken into consideration. Environmentally preferable products are often less expensive than the products they replace when life cycle costs are taken into consideration. Some examples include:

- fuel efficient vehicles, which consume less fuel over the lifetime of the vehicle;
- non-hazardous products to replace hazardous materials, which avoid requirements for costly hazardous waste disposal and associated waste management training;

- purchase of laser printer add-ons to allow double-sided printing, which reduces paper consumption;
- selection of products with energy saving features, which reduce energy consumption over the life of the product.

Web Link

The [Treasury Board Contracting Policy](#) (section 9.0) also addresses value for money.

Total Life Cycle Analysis

Life cycle analysis is used to examine the environmental impacts and financial costs of a good or service, from its design through to production and then final disposal (from "cradle to grave"). In its most detailed form, a life cycle analysis considers costs and environmental impacts associated with:

- the extraction of raw materials required to manufacture the good or deliver the service;
- the manufacture of goods;
- the distribution, use, and maintenance of the good or service; and
- the final disposal of the good.

Much of the government's focus on life cycle analysis considers the impacts and costs associated with its procurement process, namely, the four phases of procurement: planning, acquisition, use/maintenance and disposal, of goods and services. It should be recognized that the federal government can, through its choice of specifications, have positive environmental implications for earlier manufacturing-related stages in the lifecycle of the good or service being purchased. For example, specifying a requirement for:

- recycled content leads to solid waste reduction, as well as lower energy consumption related to processing of raw materials, resulting in lower greenhouse gas emissions; and
- elimination of hazardous chemicals from the production process or end product can result in the manufacturer storing, handling and disposing of less hazardous materials.

Life Cycle Costing

Life Cycle Costing is a method used to evaluate the costs of goods and services, based on each phase of their life cycle. From the government's perspective, these costs include those associated with its procurement phases:

- Planning costs, including administrative and other costs (internal to government);
- Acquisition costs, including administrative as well as design and production costs that are associated with the good or service in question;
- Operating and use/maintenance costs, including introduction and contingency costs;
- Disposal costs.

Environmentally preferable goods and services may cost more upfront than their conventional counterparts, but they frequently also demonstrate significant savings over the lifetime of the product. These savings can balance or outweigh the initial upfront costs, demonstrating that an environmentally preferable good or service is more economical in the longer term. Life cycle costing can, therefore, be used to demonstrate the greater value for money achieved by selecting environmentally preferable goods and services. The federal government has committed to the purchase of environmentally preferable goods and services where value for money is demonstrated.



Example:

A conventional analysis of printer options would look at primarily the upfront cost of the unit and the anticipated annual maintenance costs.

Life cycle costing considers the cost elements associated with:

- the possibility of consolidating operational requirements in a multi-use unit (printer, scanner, photocopier, fax)
- the purchase of the unit
- packaging return or recyclability
- general maintenance
- ability to replace damaged parts
- incremental cost of features with environmental attributes, such as duplex printing
- paper savings associated with duplex printing feature
- energy consumption
- recycled content of the unit
- recyclability of unit at end-of-life
- supplier take-back program

Web Links

- [Life cycle management](#)
- [Total Cost Assessment](#) 
- [Life Cycle Initiative](#) 

Developing Green Procurement Specifications

Sources of Information

When developing specifications for environmentally preferable goods and services, information on product attributes can come from a number of sources, including:

- **Certification programs or 'ecolabels':** These are programs that validate suppliers' claims of environmental attributes, by confirming that a product meets a certain standard of reduced environmental impact. Products meeting the standard are allowed to use the program's logo or 'ecolabel'. The standards themselves are usually publicly available and are useful for identifying environmental attributes;

- **Product databases**, that provide profiles of classes of products and the key environmental impacts that they may have. This information helps in developing specifications.
 - [US EPA's Environmentally Preferable Purchasing database](#) [www](#)
- **The suppliers**, who should be able to discuss and provide data on the environmental features of their products.
 - Use the [Green Procurement Checklist](#) as a guide for asking suppliers questions about the environmental attributes of their products.

In addition, when developing specifications, consult the following links for information to help in the development of Green Procurement specifications:

- Table 1 - Procurement Specifications which Mitigate Environmental Impacts
- Key Environmental Issues associated with Specific Government of Canada Commodities
- Green Procurement Checklist

Table 1 provides an overview of general environmental impacts that can be associated with various goods and services. Procurement actions that can be taken to mitigate these impacts are listed, with links to additional resources.

Table 1 - Environmental issues and mitigating actions via Green Procurement		
Good/service-related Environmental Issue		Mitigating Actions for Good/Service Specifications
Resource Efficiency	General	<ul style="list-style-type: none"> • Ensure products make efficient use of resources and energy throughout its lifecycle
	Energy consumption	<ul style="list-style-type: none"> • Reduce consumption. • Specify ENERGY STAR models. • Specify power-saving features. • See below for link to further Energy resources
	Water consumption	<ul style="list-style-type: none"> • Reduce consumption. • Specify water saving features.
	Fossil fuel consumption	<ul style="list-style-type: none"> • Identify alternatives that use renewable resources as raw materials rather than non-renewable fossil fuels. • Identify replacement sources of energy that are renewable. • Specify alternate products with lower fossil fuel consumption (ex. E10 fuel). • See below for link to further Fossil fuel resources

<p>GHG emissions</p>	<ul style="list-style-type: none"> • Reduce energy consumption. • Specify energy efficient models. • See below for link to further GHG resources
<p>Hazardous materials content</p>	<ul style="list-style-type: none"> • Specify products with lower hazardous material content. • Consult certification program criteria to identify acceptable levels and/or alternatives. • See below for link to further Hazardous materials and Hazardous waste resources
<p>Hazardous waste generation</p>	<ul style="list-style-type: none"> • Specify products with reduced hazardous material content. • Ensure appropriate recycling, reclamation, and/or disposal mechanisms are in place prior to purchasing items that contain hazardous materials. • See below for link to further Hazardous waste generation resources
<p>Ozone depleting substances (ODSs)</p>	<ul style="list-style-type: none"> • Specify products that do not contain ozone-depleting substances. • Identify alternatives through product certification criteria. • See below for link to further Ozone-depleting substances resources
<p>Solid waste, excluding packaging</p>	<ul style="list-style-type: none"> • Specify items that can be refurbished for reuse. • Specify items that contain recycled materials and that are recyclable. • Specify that suppliers must take back items at end-of-life, for recycling or reclamation. • Employ leasing options that enable suppliers to manage efficient capital asset usage over multiple clients. • See below for link to further Solid waste, excluding packaging resources
<p>Solid waste, packaging</p>	<ul style="list-style-type: none"> • Purchase in bulk or concentrate. • Specify products with reduced packaging. • Ensure consumer packaging is not used. • Require supplier to take back packaging. • See below for link to further resources.
<p>VOCs</p>	<ul style="list-style-type: none"> • Reduce consumption of product. • Specify low emission products, using product

database information.

- See below for link to further VOC resources

Links: Energy

- [Energy Star](#)
- [EnerGuide](#)
- [NRCan EnergyStar Savings Calculator](#)
- [NRCan Purchasing Tool Kit](#)

Consult environmental product certification standards for indications of requirements that can be specified.

Links: Fossil fuel

- [NRCan GHGenius \(GHG emissions calculator\)](#)
- [NRCan Alternative Fuel Vehicle Guide](#)
- [NRCan Choose a Fuel-Efficient Vehicle](#)
- [NRCan Fuel Consumption Guide](#)

See also [Energy links](#) Consult environmental product certification standards for indications of requirements that can be specified.

Links: GHGs

- [See links for Energy](#)
- [See links for Fossil Fuels](#)

Consult environmental product certification standards for indications of requirements that can be specified.

Links: Hazardous materials and Hazardous waste

- [Canadian Environmental Protection Act, 1999](#)
 - [Toxic Substances List](#)
- [Transportation of Dangerous Goods Act - Hazardous Material listing](#)
- [US EPA Hazardous Waste listing](#) 



Consult environmental product certification standards for indications of requirements that can be specified.

Links: Ozone-depleting substances

- [EPA Government list of ozone depleting substances](#) 

Consult environmental product certification standards for indications of requirements that can be specified.

Links: Solid waste

- [GIPPER Guide \(PDF version\)](#) 
- [Environmental Defense Paper Calculator](#) 

Consult environmental product certification standards for indications of requirements that can be specified.

Links: Packaging

- [GIPPER Guide \(PDF version\)](#) 
- [Commonwealth Handling Equipment Pool](#) 
- [Canadian Pallet Council](#) 

Consult environmental product certification standards for indications of requirements that can be specified.

Links: VOCs

- [CCOHS IAQ information](#) 

Consult environmental product certification standards for indications of requirements that can be specified.

Commodity-specific Environmental Concerns and Suggested Green Specifications

Note: Specifications recommended in this section are suggestions only and do not represent an endorsement of any certification program or specific environmental product attribute by PWGSC.

Every good and service has different environmental impacts. The following listing looks at PWGSC's commodity groups and summarizes key environmental impacts associated with each one. Links to further commodity-specific resources are provided to help purchasers identify environmentally preferable options and incorporate them into bid and contract specifications.

- IT Equipment/computers/printers/network infrastructure
- Furniture
- Fuels and Lubricants
- Office Supplies
- Imaging and Print Services

IT Equipment/computers/printers/network infrastructure






Key environmental issues:

- Energy consumption during use
- Toxic and hazardous chemical and substance content, including heavy metals (lead, cadmium, mercury)
- Use of hazardous materials in the production process
- Solid waste associated with used equipment
- Packaging waste

Specifications to be considered, which mitigate product-related environmental concerns:

- Specify goods to
 - be EnergyStar rated, including energy-saving features such as 'powerdown'
 - contain recycled material
 - minimize hazardous material content
 - be recyclable
- Extend asset life (i.e. use for 4 years instead of 3)
- Define clear steps for recycling and/or disposal in the purchasing contract:
 - Require take-back programs for used equipment
 - Ensure reclamation or proper disposal of hazardous materials
- Request evidence of supplier's Environmental Management System (EMS) or certification such as ISO 14000
- Minimization, take-back, and/or recycling of packaging

Resources:

- [European Union RoHS Directive](#) 
- [UK RoHS information](#) 
- [NRCan Purchasing Tool Kit \(Energy specifications\)](#)
- [Environmental Choice Criteria for Business Machines and Office Products](#) 
- [EPEAT - Electronic Product Environmental Assessment Tool](#) 
- [US EPA Environmentally Preferable Purchasing](#) 

Furniture

Key environmental issues:




- Solid waste generation from disposal of used product and packaging
- Consumption of non-renewable resources (fossil fuels for production of plastics and synthetic fibre)
- Consumption of renewable resources (timber)
- Hazardous material content (VOCs), impacting indoor air quality (IAQ)

Specifications to be considered:

- Specify goods to:
 - have recycled fabric, plastic and/or wood content
 - be recyclable and ensure that they will be directed to recycling at end of life
 - have low VOC content
 - Design for Environment (DFE) attributes

- have Ecologo certification
- Improved asset management
 - Ensure use of warranties to replace damaged parts, rather than full replacement
 - Re-deploy used assets to reduce purchase of new items
- Consider suppliers with Sustainable Forestry Management and Lean Manufacturing practices
- Require take back programs for used equipment and ensure recycling occurs
- Require minimization, take-back, and/or recycling of packaging

Resources:

- [Environmental Choice Furniture criteria](#) 
- [US EPA Environmentally Preferable Purchasing \(United States\)](#) 
- [CCOHS IAQ information](#) 

Fuels and Lubricants

Key environmental issues:

- Combustion emissions, such as greenhouse gases, ground level ozone, particulates, and other chemicals
- Release of toxic and hazardous chemicals and substances (both fuel material itself and combustion products can be hazardous substances)
- Hazardous waste generation (storage tank residuals, spills resulting in soil and water contamination)

Specifications to be considered:

- For regular gasoline and diesel powered vehicles, consider:
 - Alternative fuels such as Ethanol 10 (E10)
 - Ultra low sulphur diesel for diesel vehicles (October 2006 availability)
- Alternative fuels such as Ethanol 85 (E85) for specialty or flex-fuel vehicles
- For oils, lubricants and other vehicle fluids (i.e. coolant, etc.) consider:
 - re-refined or recycled products
 - products which exclude environmental contaminants i.e. glycol-free engine coolant
- Use of bio-based oils and lubricants and bio-diesel, where performance is deemed sufficient to meet needs
- Ensure recovery of waste oil for recycling

Resources:

- [Environmental Choice Criteria for Automotive Products](#) 

Office Supplies

Given the diversity of products that can be considered office supplies, the focus in this section is on toner cartridges and paper. However, many of the issues and specifications cited would apply to other products within this class as well.

Key environmental issues:

- Consumption of renewable resources, particularly in paper production
- Hazardous materials management, particularly related to toner cartridges
- Solid waste
- Packaging

Specifications to be considered:

- Require recycled content in paper
- Require recycled content in plastics-containing products (i.e. binders)
- Reduce paper weight, where printing equipment allows
- Use recyclable toner cartridges
- Specify products that contain:
 - reduced quantities of VOCs and solvents (i.e. highlighters, markers, etc.)
 - no hazardous materials such as mercury, lead, etc. (i.e. pens, pencils)
 - no chlorinated plastics
 - vegetable-based inks
- Request bulk packaging vs. consumer packaging to minimize waste
- Request recyclable packaging
- Supplier evidence of Environmental Management System or certification (i.e. ISO 14000) and/or use of Sustainable Forestry Management (SFM) practices.

Resources:

- [Environmental Choice Program](#) 
- [US EPA Environmentally Preferable Purchasing](#) (United States) 

Imaging and Print Services

A number of departments are currently moving toward a managed print service approach for printing requirements. Managed print services can be described as a full service approach to printing where a single vendor provides equipment, supplies, and maintenance services and charges the client by the printed page.

Key environmental issues:

- Energy consumption during provision of service
- Consumption of renewable resources (related to paper products)
- Solid waste (e-waste)
- Packaging

Specifications to be considered:

- Require vendors to apply the following criteria when performing print services:
 - Energy Star for all equipment
 - Design for Environment (DfE) standards apply to all equipment
 - Indoor Air Quality (IAQ) considerations related to VOC generation
 - Use of cost management software to minimize the use of paper

- 3rd party certification of vendors (Ecologo and/or EMS system such as ISO 14000)
 - use of vegetable-based inks, where feasible
- e-Waste management for end-of-life equipment (see [Computer & IT hardware](#) section)
- Reduce, take-back and recycle packaging
- Use of electronic media to reduce paper usage
- Equipment designed for upgrades and updates vs. disposal and installation of new asset

Resources:

- [NRCan Purchasing Tool Kit](#) (Energy specifications)
- [Environmental Choice Criteria for Business Machines and Office Products](#) [www](#)
- [US EPA Environmentally Preferable Purchasing](#) (United States) [www](#)
- [European Union RoHS Directive](#) [www](#)
- [UK RoHS information](#) [www](#)

Green Procurement Checklist

Once the decision is made to pursue an acquisition, environmental performance specifications need to be incorporated in the initial bid documentation. Listed below are various environmental performance considerations that may be applicable. Consider the following questions when establishing specifications for a product or scope of work for a service.

- Departmental Objectives
- 3R's Considerations
- Environmental Certification
- Performance Testing
- Energy and Resource Efficiency
- Hazardous Materials and VOCs
- Packaging
- Warranties and Durability
- Maintenance
- On Site Waste Management
- Return for Disassembly and Recycling
- Disposal
- Indirect Costs
- Environmental Attributes of the Suppliers

Departmental Objectives

- What specific Green Procurement objectives have been established by the procuring department? The Green Procurement Policy requires, as appropriate, departments to set targets for Green Procurement either through departmental SDSs or internal planning documents.

3R's Considerations

- Reduce: Is there a need for the purchase? Are there opportunities to reduce consumption? Can demand for the item be aggregated amongst multiple users, to achieve better asset utilization? Can a service be used to meet the need?
- Reuse: Can a second-hand or used item meet the requirement? When re-using items, consider costs of refurbishing and maintenance.
- Recycle: Can the item be recycled at end of life? Do programs exist for recycling?

Environmental Certification

- Has the product/service been certified by an independent organization such as Environmental Choice?
- Have studies of the environmental attributes of this product been completed?
- Are pre-established environmental standards available?

Performance Testing

- Is it possible to test the product/service prior to purchase?
- Does the product meet the required performance specifications?

Recycled Content & Renewable Resources

- Does the product include post-consumer recycled content?
- What type and what percentage of recycled materials does the product contain?
- Does the product contain reconditioned parts?
- Is the product made from renewable resources?

Energy and Resource Efficiency

- Does this product make efficient use of resources and energy throughout its lifecycle? Is it made with resource-saving materials or processes?
- What are the running costs such as energy or water consumed by the product over its life? Does it consume less energy, relative to its competitors?
- Does the product have any energy, water or fuel saving features such as Power Down Mode?
- Are there clear instructions as to how to use the product the most efficiently?
- Does this product generate less waste than its competitors?

Hazardous Materials and VOCs

- Does the product require Material Safety Data Sheets (MSDS)?
- Do the suppliers offer a non-hazardous equivalent for this product?
- Does the product release VOCs? Is there a suitable replacement that generates lower emissions?

Packaging

- Is the packaging necessary? Can it be eliminated?
- Is the packaging reusable? Does it contain reusable parts? Is it recyclable?
- Will the suppliers remove the packaging from the site following installation?
- Is the packaging made from renewable resources?
- Does the packaging material contain post-consumer recycled materials?

Warranties and Durability

- Is the product durable? What is the expected useful life span of the product?
- How long is the warranty and should an extended warranty be purchased to increase life span?
- Is it economical to repair the product?
- Is the product reuseable or does it contain reuseable parts?

Maintenance

- Is the product designed for easy maintenance and repair?
- Are maintenance and replacement parts readily available and reasonably priced?
- Is the product easy and cost effective to upgrade?

On Site Waste Management

- During the project will all wastes be source separated on site and recycled?
- Are there local recyclers that can be used for waste management?

Return for Disassembly and Recycling

- Can the product be disassembled for reconditioning and reuse?
- Is the product recyclable?
- Do appropriate local facilities exist for recycling?
- Does the product include a return for recycling policy?
- Will consumables (such as toner cartridges) be accepted for recycling?

Disposal

- What is the quantity of waste generated by the product during the use and disposal phases?
- What is the cost of disposal arrangements?
- Where hazardous waste is involved, can a certified recycler be engaged to reclaim or recycle material?

Indirect Costs

- What indirect costs are associated with the good or service (ex. less energy efficient IT equipment will produce more heat causing the building's air conditioning system to work harder, and increase electricity costs)?
- Do administrative costs, such as complying with WHMIS, apply?

Environmental Attributes of the Suppliers

- Do the suppliers have a certification or registration (e.g. ISO 14001 registration)?
- Do the suppliers have an Environmental Management System (EMS) or Environmental Policy in place?
- Do the suppliers engage in voluntary environmental initiatives?
- Have the suppliers received any environmental violations within the past five years? See Environment Canada's [Environmental Enforcement](#) website for info on Canadian Environmental Protection Act violations.

Environmental Product Terminology

An important skill to develop is the ability to evaluate the claims that suppliers make to represent the environmental attributes of their products. Definition of environmental terminology that is regularly encountered when reviewing environmentally preferable goods and services is provided here.

Note that some terminology has a standardized meaning and can require certification prior to being used by suppliers. Other terminology is more generic and can be meaningless, unless a specific standard is cited to back up the claim.

It is also important to note that some environmental features are achieved by compromising others: for example, a product that shows high durability, may contain more hazardous materials or volatile organic compounds (VOCs) than lower durability competitors. It is therefore important to understand the overall environmental qualities of a product, and not only individual features.

The following points should be considered when reviewing environmental claims:

- Be wary of 'generic' environmental claims that are unregulated or ill defined.
- Encourage suppliers to highlight environmental product attributes.
- Validate supplier claims by checking for certification, and asking for proof of environmental attributes, such as standards and methods used to reduce environmental impacts.

Glossary of Environmental Terminology

- 3Rs
- Degradable
- Durable
- Embodied energy
- Energy efficient (see Resource efficient)
- Environmentally preferable/safe/friendly
- Greenhouse Gases (GHGs)
- Hazardous materials
- ISO registered
- Non-hazardous (see hazardous materials)
- Non-toxic
- Ozone friendly, Ozone depleting substances (ODSs)

- Recycled content (post-commercial, pre-consumer)
- Recyclable
- Resource efficient (Energy, water, fuel)
- VOCs

3Rs - Reduce, Reuse and Recycle

The 3Rs are a basic methodology that can be applied to almost any activity or purchase. They are hierarchical, with 'reduce' being the most important, followed by 'reuse' and 'recycle'. Recycling has no impact on consumption (of finished products), whereas the first two options do. The 3Rs are applicable to deciding if an item needs to be purchased as well as which item to choose.

- **Reduce** - Do we really need it or can we find an alternative?
- **Reuse** - Can we find a surplus item or upgrade an existing item?
- **Recycle** - Purchase products that can be recycled or contain recycled content.

For example:

Reducing the actual use of fine paper is the most effective way of saving money and resources, while re-use of old paper further slows down the rate at which new paper is consumed. At a cost of \$600 to \$1000 per tonne of fine paper, savings add up quickly. Finally, recycling used paper reduces environmental impact and can generate profits, too: a tonne of waste paper earns revenues from the sale of the material, as well as realizes savings by eliminating the need to haul the material to landfill. These revenues and savings are offset by the costs of collection.

Degradable

A degradable material is one that breaks down in such a way that the resulting materials can be easily assimilated into the environment, without having any significant negative impact on the environment. Degradability claims on package labels usually refer to biodegradability and/or photodegradability. While many materials are ultimately degradable, the conditions under which these materials are disposed of, usually through landfill, may hinder the degradation process. Generally, light must be present in order for a product to photodegrade, while biological degradation requires oxygen to be present. Neither light nor oxygen is readily available in conventional landfills. Therefore, ***a supplier's claim of degradability only has value if the disposal conditions are appropriate for degradation to occur.*** Furthermore, if a product is only partly degradable, those ingredients that are identified as degradable should comprise a significant part of the product.

Suppliers should cite specific standards when making claims of degradability. The American Society for Testing Materials (ASTM) and Organization for Economic and Cooperative Development (OECD) publish degradability standards for a range of material, including plastics and chemicals. For example, ASTM standard 6400 sets out criteria (60% degraded within 180 days) that plastics must meet to be considered compostable.

Durable

By definition, durable means useful for a long period; resisting wear, decay, etc. Durable products are environmentally preferred, in principle, because they can be reused or upgraded, they keep resources from landfill, and reduce the need for the consumption of raw materials. However, there are no set criteria for durability. When a supplier claims that a product is more durable compared to competitors, ask for further information, such as the expected lifetime of the product, options for reuse and/or upgrade, and availability of replaceable parts that prevent disposal in the event of a breakdown. Consider the claim of durability in the context of degradability and hazardous materials. Some durable products may not ultimately degrade upon disposal or contain chemicals that slow the rate of wear and are ultimately harmful to the environment and/or human health.

Embodied Energy

Embodied energy is the term used to describe the total energy consumption associated with production and delivery of a product. It includes a measure of the energy used to extract, process and deliver the raw materials needed to make the product, as well as other inputs, and includes the energy required to transport the product. Generally speaking, the less energy used to produce and deliver a product, the better it is for the environment.

Environmentally Preferable, Environmentally Safe, Environmentally Friendly, Green

In the Policy on Green Procurement, 'environmentally preferable' goods and services are defined as 'those that have a lesser or reduced impact on the environment over the life cycle of the good or service, when compared with competing goods or services serving the same purpose.'

As a product label, however, the terms environmentally 'preferred', 'safe' or 'friendly' have no standard definition. The same is true for terms such as 'environmentally responsible' or 'green'. Therefore, this claim can be meaningless, unless specific environmental standards are cited. Suppliers should be requested to provide complete information as to why they deem their product to be environmentally preferable to its competitors.

Greenhouse Gas Emissions (GhGs)

Greenhouse gases include any of the atmospheric gases that contribute to the 'greenhouse effect'. The greenhouse effect is the trapping of heat within the earth's atmosphere, by atmospheric gases, and is the cause of global warming. The greenhouse gases include carbon dioxide, (CO₂), methane (CH₄), nitrous oxide (N₂O), halogenated fluorocarbons (HCFCs), ozone (O₃), perfluorinated carbons (PFCs), and hydrofluorocarbons (HFCs). Emissions and accumulation of these gases in the atmosphere are caused by the burning of fossil fuels (oil, gas, coal, etc.) and the release of some manmade chemicals. Reduction in emissions of these gases is being targeted to prevent/reduce global warming.

Products and services that burn less fuel or consume less energy can claim that they have lower GhG emissions. The claim can be verified by looking at the product's or service's total fuel consumption, compared to its competitors. Some examples include:

- A vehicle that has better fuel efficiency, burns less fuel per km driven and therefore emits less greenhouse gases than a lower efficiency vehicle.
- The less electricity an appliance uses, the less GhGs will need to be released to the atmosphere by coal-fired electricity generating stations.
- The better insulated a building is, the less heat is lost to the exterior and therefore the less fuel burned to maintain comfortable temperatures. As a result, the building will cause the emissions of less greenhouse gases than one that is poorly insulated.

Hazardous Materials

Generally speaking, products considered "hazardous" are dangerous to human health. The two most common Canadian references to hazardous materials can be found in the Workplace Hazardous Materials Information System (WHMIS) and the Transportation of Dangerous Goods (TDG) Act. Industrial suppliers must provide Material Safety Data Sheets (MSDS), which provide information regarding the risks of using a product and precautions to be taken to safely use, store and dispose of such products. However, only products for use in an industrial setting are regulated by WHMIS and TDG.

The Hazardous Products Act and the Consumer Packaging and Labeling Act regulate the labeling of consumer products, for use in both industrial settings and by consumer households. Consumer products that can pose a safety risk are marked as being flammable, corrosive, poisonous or explosive.

Product specifications should be checked for hazardous material content. Replacement options that contain no hazardous materials should be considered. If non-hazardous options are not feasible, compare available options to identify those with the lowest hazardous material content. Ensure that appropriate use and disposal arrangements exist, to ensure that the product can be safely used and discarded.

Web Links

See the PWGSC Customer Manual for a listing of Hazardous Materiel.

- [Workplace Hazardous Materials Information System \(WHMIS\)](#)
- [Transport of Dangerous Goods Act](#)
- [Hazardous Products Act](#)
- [Consumer Packaging and Labeling Act](#)

ISO Registered



The International Organization for Standardization (ISO) is a worldwide federation of national standards bodies. The ISO 14001 standard is being used by organizations around the world to develop Environmental Management Systems (EMS). An EMS provides a framework for managing environmental responsibilities efficiently and

supports their integration into overall business operations. An organization may simply base their EMS on the standard or it may choose to become officially registered to the standard, in which case it must periodically undergo audits by an ISO 14001 "registrar." The establishment and registration of an EMS to ISO 14001 demonstrates that a company has procedures for monitoring and complying with regulatory requirements, exercises due diligence with respect to environmental risks and is continually improving their environmental performance.

ISO 14020 to 14024 eco-labelling standards address product labeling, environmental claims made by suppliers, and the standardization of environmental terminology.



Procurement officers have access to more detailed information about the ISO 14000 standards through the Canadian General Standards Board (CGSB).

Web Links

- [International Organization for Standardization \(ISO\)](#) 
- [ISO 14000](#) 
- [Canadian General Standards Board – ISO 14000](#)

Non-Toxic

Toxicity is defined as "the inherent potential or capacity of a material to cause adverse effects in a living organism." (State of the Environment Report, 1991). There is little value or consistency to the 'non-toxic' label, unless backed up by a certification. The certification standards cited should be reviewed to better understand the meaning of the 'non-toxic' claim.

When comparing 'non-toxic' products to conventional products, ask the supplier to specifically indicate what makes their product non-toxic. For example, non-toxic markers, do not contain xylene and toluene, two substances specifically named as "hazardous" by Workplace Hazardous Material Information System (WHMIS) standards (see [WHMIS](#)  website). The Canadian Environmental Protection Act maintains a list of [Priority Substances](#)  that are deemed toxic to the environment.

Ozone Friendly, ozone depleting substances (ODSs)

The ozone (O₃) layer protects the Earth against UV radiation. A class of chemicals known as halocarbons, are used in packaging, foam, and as solvents, propellants and refrigerants. They are particularly harmful to the ozone layer, interacting with and destroying it. This allows harmful UV radiation to pass through to the Earth's surface.

There is no set definition of 'ozone-friendly' but it is generally intended to indicate that a product is free of chemicals, typically halocarbons, which damage the ozone layer. The most commonly cited examples, chlorofluorocarbons (CFCs), have been banned in industrialized countries since 1996. However, replacement substances, such as hydrochlorofluorocarbons (HCFCs), are still in use, have some potential to deplete the ozone layer, and should be avoided wherever possible

A useful product label, which is controlled by the US Environmental Protection Agency (US EPA), indicates *"Contains no CFCs or other ozone depleting substances. Federal regulations prohibit CFC propellants in aerosols"* . The EPA maintains a list of ozone depleting substances and this label allows the identification of products that do not contain these substances. The label is most frequently found on cleaning products.

Products containing non-ozone-depleting substitutes should be considered preferable over those that deplete ozone. It's important to note that replacements do exist. For example, hydrocarbons can be used as a refrigerant, in place of HCFCs.

Web Link

- [EPA Government list of ozone depleting substances](#) 

Recycled Content: Post-commercial/Pre-consumer

Re-cycled content is the portion of a product, by weight or volume, which is composed of materials recovered for recycling. Packaging can also have recycled content, usually measured by weight. Products containing recycled content have a positive environmental impact because they divert waste material from landfill and can reduce energy consumption, by re-processing recycled materials, rather than using virgin resources.

There are two types of recycled material:

Pre-consumer material indicates material recycled prior to use by the consumer, i.e., industrial scrap material left over from an industrial process that is not capable of being reused or reprocessed within the same plant or process (ex. Boxboard trim). To make an appropriate "pre-consumer" recycled content claim, a supplier must be able to substantiate that the pre-consumer material would otherwise have gone into the solid waste stream.

Post-commercial materials are generated by commercial and institutional facilities, or households. They can no longer be used for their intended purpose and are separated from the waste stream for recycling. Post-use material excludes the in-plant reutilization of materials, such as re-work, re-grind, re-pulp, or scrap materials generated within the plant and capable of being reused within the process that generated it.

Recyclable

When an item is recycled, it is separated from the solid waste stream, diverted from landfill and re-processed into a new product through an established recycling program. A claim of recyclability should make clear to consumers whether it refers to the product, the package, or both.

To determine if a product is recyclable, information on recycling facilities and processes is needed. Many products may be recyclable in principle but without local

processing facilities they will be directed to landfill. Equally important is the existence of a recycling system in the workplace.

CSA and ISO standards attempt to define the term 'recyclability', by requiring that a recyclable claim be made only if the material in question is currently being accepted at "reasonable" levels for recycling. An industry benchmark for the claim of recyclability is that "at least one third (1/3) of the population in the area where the product is distributed has convenient access to collection or drop-off facilities for recycling".

Resource Efficient

Resources include raw materials such as timber, minerals and metals, water and energy sources. Resource efficiency means that resources are used in the most productive and economical way possible, keeping quantities consumed and waste to a minimum. Ideally an item should be resource-efficient throughout its life – from design and manufacture through to use/maintenance and disposal. When assessing resource efficiency, consider elements such as:

- energy consumption during delivery, use/maintenance and disposal;
- features that reduce energy, fuel or water use;
- capacity of product (e.g., is it larger than necessary to meet the need?);
- waste generation during use; and
- quantity of packaging.

VOCs

Volatile Organic Compounds (VOCs) change rapidly from a liquid state to a gaseous state when exposed to air. VOC vapours react with oxides of nitrogen in the presence of sunlight to produce low level ozone, an air pollutant and a contributor to smog. Indoors, VOCs can adversely impact indoor air quality (IAQ), a measurement of the quality of air in a particular building based on the concentration of chemicals, particulates and other elements harmful to human health. Sources of VOCs include off-gassing from furniture, carpets, printers, cleaning products, markers and paint fumes. Products that contain fewer VOCs are generally better for the environment. For example, paints that are water-based, contain no heavy metals or formaldehyde and contain less than 25 grams/litre of VOCs, have fewer air emissions than standard paints and are considered environmentally preferable.

Web Links

- [Canadian Council on Health & Safety \(CCOHS\)](#)  (IAQ information)
- [GreenGuard](#) (IAQ improvement) 

Green Product Standards and Certification Programs

- Eco-labels
- Links to Product Standards, Specifications, and Product Guides
- Links to Product Specific Information

- Hotel Rating Programs
- Building and Real Property Programs

Eco-labels

General Information

Eco-labels are symbols used on products to indicate that they have been certified to a specific environmental standard. There are three types, as defined by International Standards Organization (ISO):





- Type I: Indicates environmental preferability within a sector and is based on life-cycle performance of a pre-defined and weighted set of core environmental attributes. Only top performers within a sector are able to use the label. The claims are independently verified.
- Type II: These labels are environmental declarations made by manufacturers/importers/distributors. Typically, they are based on a single attribute such as 'contains x% recycled content' or 'biodegradable'. The labels are not independently verified but they may be defined by a regulatory body.
- Type III: The label gives environmental information on a product, sometimes in the form of a data list, similar to a nutritional label for food. The information is based on the life-cycle performance of a pre-defined and weighted set of core environmental attributes. The claims are independently verified to achieve a certain standard, but unlike Type I, they are not applied only to the top performers in a class, but broadly to any product that meets the standard.





Eco-label programs exist in most countries in Europe and North America. Some of the more common ones are outlined in this section. These labels are most valuable in allowing for rapid identification of environmentally preferable products, especially where lifecycle costing may be too time-consuming or may not be warranted based on the value of the purchase. For example, eco-labels can be used for

- Low individual value items, particularly those of a consumable nature, such as office supplies, cleaning supplies, etc.
- Industrial supplies
- Building products
- Services, such as hotels

Web Links


A brief description of various certification programs is provided below, or visit their websites directly via these links:

- [Environmental Choice™](#) (Canadian) 
- [Green Seal](#) (US) 
- Foreign Certification Systems:
 - [Global Ecolabelling Network](#) (International) 
 - [EUROPA - Ecolabel](#) (European) 

- [Green Hotels](#) 
- [Envirodesic](#) 
- [LEED](#) 
- [BOMA Go Green](#) 
- [R-2000](#)


Environmental Choice™ Program

The Environmental Choice™ program is the Canadian government products and services labelling program that provides guidelines for environmentally preferable goods and services, and grants licenses to products that successfully meet the guidelines. Their mission is to: *"Reduce the stress on the environment by encouraging the demand for, and supply of, environmentally responsible products and services."*



The Program's official symbol of certification is the EcoLogo™. For details of product standards and certification, visit the [Environmental Choice™](#)  website or contact Terrachoice Environmental Marketing in Ottawa, Ontario.

Green Seal



Green Seal is a private organization based in Washington, DC. Much like the Environmental Choice Program, Green Seal sets environmental standards and certifies products that meet the established criteria for low life-cycle impact on the environment. The Green Seal is awarded to products that have less impact on the environment and work well. Green Seal standards are set so that they identify the most environmentally preferable products currently available; thus, they are leadership standards.

For more information, visit the [Green Seal](#)  Web site.

Foreign Certification Systems

Although Canada may not have standards for certain products, other countries may. These standards can be consulted to determine if a given product may be considered environmentally preferable. The [Global Ecolabelling Network](#)  lists countries that have established eco-labelling criteria for different classes of products and provides links to organizations from which criteria are available. The [EUROPA - Ecolabel](#)  website lists eco-labelling criteria for labeling systems from many European countries.

Links to Product Standards, Specifications and Guides

- [Energy Star](#)
- [EnerGuide](#)
- [Canadian General Standards Board \(CGSB\)](#)
 - [Recycled toner cartridge standards](#)
- [Canadian Standards Association \(CSA\)](#) 
 - [CSA - Forest Products Marking Program](#) 

- [EPEAT - Electronic Product Environmental Assessment Tool](#) [www](#)
- [US EPA Environmentally Preferable Purchasing](#) [www](#)
- ROHS
 - [European Union RoHS Directive](#) [www](#)
 - [UK RoHS information](#) [www](#)

Links to Product Specific Information

- Electronic Products
 - [Energy Star](#)
 - [EPEAT - Electronic Product Environmental Assessment Tool](#) [www](#)
- Office Supplies
 - [Recycled toner cartridge standards](#)
 - [Paper products](#)
- Forestry Products
 - [Forestry Stewardship Council](#) [www](#)
 - [Sustainable Forestry Initiative](#) [www](#)
 - [CSA – Forest Products Marking Program](#) [www](#)
 - [Programme for Endorsement of Forestry Certification schemes](#) [www](#)
 - [Forest Certification Resource Center](#) [www](#)
 - [Yale Program on Forestry Policy and Governance](#) [www](#)

Hotel Rating Programs:




Green Leaf Eco-Rating Program

The Green Leaf™ Eco-Rating Program is a graduated rating system designed to identify hotels committed to improving their bottom line fiscal and environmental performance. The program was established by TerraChoice Environmental Services, to recognize environmental achievements through a reward of 1 to 5 Green Leaves; 1 for a minimum of committing to a set of environmental principles and 2 through 5 for results in applying those principles. The [Green Key](#) [www](#) web site lists participating hotels. Green Leaf ratings are also listed for participating hotels in the [PWGSC Accommodation and Car Rental Directory](#).

Green Key ECOMmodation Rating Program

The Hotel Association of Canada's ECOMmodation Rating Program is a graduated rating system designed to recognize hotels, motels, and resorts that are committed to improving their fiscal and environmental performance. Based on the results of a comprehensive environmental audit, hoteliers are awarded a 1-5 green key rating and given guidance on how to "unlock" opportunities to reduce operating costs and environmental impacts through reduced utility consumption, employee training, and supply chain management. Visit the [Hotel Association of Canada's](#) [www](#) website for more details. Green Key ratings are also listed for participating hotels in the [PWGSC Accommodation and Car Rental Directory](#).

Building and Real Property Programs

- [LEED \(Leadership in Environmental and Energy Design\)](#) 
- [BOMA \(Building Owners and Managers Association of Canada\)](#) 
- [Envirodesic](#) 
- [R-2000](#)

LEED Standards

The LEED (Leadership in Energy and Environmental Design) Green Building Rating System ® is a voluntary, consensus-based national standard for developing high-performance, sustainable buildings. It addresses many environmentally preferable building construction options, in areas as diverse as selection of construction materials, lighting, energy efficiency, and water use. In some cases, there may be an incremental cost associated with selecting environmental features, however, payback in operational and energy savings is expected.

The Government of Canada has committed to the use of LEED Gold standards for all new office building construction. Further detail required on standards and how they relate to green procurement, refer to the links below.

Web Links

- [LEED](#) 
- [Canadian Green Building Council](#) 

BOMA & Green Globes

Green Globes is geared at the design of energy and resource efficient buildings, that will achieve operational savings and be healthier to work or live in. Green Globes consists of both a guide for integrating green design principles and an assessment protocol. Using confidential questionnaires for each stage of project delivery, the program generates comprehensive on-line assessment and guidance reports. Using Go Green Comprehensive is a program based on the Green Globes system, and is being implemented by PWGSC for all existing federal buildings.

Web Link

- [BOMA Go Green](#) 

Envirodesic™

The Envirodesic™ Certification Program helps buyers identify buildings, products and services that promote healthier indoor environments. It is endorsed by the Lung Association's C.A.N. DO - the Movement for Clean Air Now, as "the appropriate certification route for builders, manufacturers and service providers where maximum indoor air quality is required." Products include insulation and cleaning products.

Web Link

- [Envirodesic](#) 

R-2000 Housing Standard

R-2000 is NRCan's residential housing standard and can be applicable to government-built housing. The R-2000 Standard includes requirements related to energy efficiency, indoor air quality and the use of environmentally responsible products and materials. The R-2000 program also showcases new energy technologies and trains builders in energy-efficient techniques.






Web Link

- [R-2000](#)






Links to:

- Green Procurement Purchasing Guides
- Green Procurement Tools
- OGGO Green Procurement Publications
- Government Resources
- Government Programs
- Government Policies and Legislation
- International Sources of Information

Green Procurement Purchasing Guides

- [Sustainable Purchasing Guide](#) 
- [City of Richmond Environmental Purchasing Guide](#) 
- [Environmentally Preferable Purchasing](#) (U.S. Environmental Protection Agency) 
- [Federal Trade Commission - Environmental Marketing Guides](#) (US) 
- [Environmental Purchasing Guide \(version PDF approx. 521 Ko\)](#) (Australie) 

Green Procurement Tools

- [NRCan Purchasing Tool Kit](#)
- [NRCan EnergyStar Savings Calculator](#)
- [NRCan GHGenius \(GHG emissions calculator\)](#)
- [Atmosfair – GhG Travel Calculator](#) 
- [Environmental Defense Paper Calculator](#) 
- [NRCan Alternative Fuel Vehicle Guide](#)
- [NRCan Choose a Fuel-Efficient Vehicle](#)
- [NRCan Vehicle Life Cycle Cost Comparison](#)
- [Total Cost Assessment](#) 
- [Life Cycle Initiative](#) 
- [Environmental Choice Program](#) 

OGGO Green Procurement Publications

- [Guideline for Integration of Environmental Performance Considerations in Federal Government Procurement](#)
- [Green Procurement Decision Making Tool](#) (setting Green Procurement targets)
- [Green Procurement - FAQ](#)

Government Resources

- [Natural Resources Canada](#)
 - [Office of Energy Efficiency](#)
 - [Purchasing Tool Kit](#)
 - [Energy Star Savings Calculator](#) – note addition of 'Energy Star'
 - [Alternative Fuel Vehicle Guide](#)
 - [GHGenius](#)
 - [Choose a Fuel-Efficient Vehicle](#)
- [Environment Canada](#)
 - [Greening Government Operations](#)
 - [Environment Canada's Green Meeting Guide \(PDF version Approx. 756 Kb\)](#)
 - [Canadian Pollution Prevention Clearinghouse](#)
 - [National Pollutant Release Inventory](#)



Government Programs

- [Federal Buildings Initiative \(FBI\)](#)
- [PWGSC SDS Guidance 2007 - 2009](#)
- [Extended Producers Responsibility](#)
- [Procurement](#)

Policies and Legislation

- [Policy on Green Procurement](#)
- Treasury Board [Materiel Management Policy](#)
- Treasury Board [Motor Vehicle Policy](#)
- [Directive on Fleet Management - Executive Vehicles](#)
- [Alternative Fuels Act](#)
- [Canadian Environmental Protection Act, 1999](#)
 - [Toxic Substances List](#)
- [Energy Efficiency Act](#)
- [Transportation of Dangerous Goods Act](#)
- Sustainable Development Strategy Information:
 - [Environment Canada - Sustainable Development Strategy Information](#)
 - [PWGSC SDS 2007-2008](#)
 - [PWGSC SDS Guidance 2007-2009](#)

International Sources of Information

- [Environmentally Preferable Purchasing](#) (U.S. Environmental Protection Agency) 
- [Federal Trade Commission - Environmental Marketing Guides](#) (US) 

- [FedCentre Buying Green \(US\)](#) 
- [Green Public Procurement \(EU\)](#) 