



Smart Purchases Big Impact

Sustainable Purchasing Guide
Furniture

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A small black silhouette of a tree with many leaves.



Introduction

This section provides information on currently available **furniture** options that can help to move the University of Saskatchewan toward its sustainability goals. Living within the boundaries of our sustainability objectives requires us to apply two main strategies:

Dematerialization requires that we reduce the amount of materials as much as possible; and that we continually move toward the use of 100% recycled content.

Substitution requires that we find less harmful materials to replace those that currently damage and are not recyclable.

Sustainable purchasing is about including social, environmental, financial and performance factors in a systematic way. It involves thinking about the reasons for using the product (the service) and assessing how these services could be best met. If a product is needed, sustainable purchasing involves considering how products are made, what they are made of, where they come from and how they will be used and disposed.

Finally, remember that this is an evolving document – it will change with new information as our understanding of sustainability impacts and potential solutions improves.

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Big Impact**

Wherever possible **CHOOSE** products that employ a combination of characteristics listed in the left hand column, and **AVOID** products that demonstrate characteristic in the right-hand column.

CHOOSE

- Eco-Logo and FSC Certified
- Natural fibres
- Locally manufactured and Canadian-made
- Latex foam
- Refurbished furniture

AVOID

- Plastic foam containing CFCs or HCFCs.
- Formaldehyde and VOC emitting materials
- Polybrominated Diphenyl Ethers
- Synthetic fibres
- Polyurethane foam

Option: Refurbish Current Furniture Stock

Strategy: Dematerialization (SO 1, 2, 3, 4)

The best way to reduce the impact of purchasing new furniture is to refurbish existing pieces. Re-upholstering and restoring furniture is also an excellent cost saving measure.

Option: Buy Furniture with Eco-Logo or FSC Certification

Strategy: Substitution and Dematerialization (SO 1, 2, 3, 4)

The EcoLogo Program certifies a number of furniture products. All of the products outlined have been evaluated and audited to ensure compliance with EcoLogo criteria. These criteria reflect environmental leadership in the furniture sector and support reduced environmental impacts. The Forest Stewardship Council of Canada certifies wood products and verifies that the forests providing the resources are sustainable.

Option: Choose Low-Emitting Materials

Strategy: Substitution (SO 2)

Volatile Organic Compounds (VOCs) are carbon-based chemicals, such as benzene, toluene and formaldehyde that evaporate easily at room temperature, and may cause health problems. Products such as particle board, paints and adhesives may emit VOCs. Polyurethane foam and synthetic fibres used in upholstered furniture may also produce emissions.

Furniture made with low emitting materials can be specified. EcoLogo, Green Guard and Green Seal all provide resources for finding low-emission products.

Option: Buy Furniture Made Locally or in Canada

Strategy: Substitution (SO 1, 2)

Choose mattresses and pillows made in Canada. Not only does this reduce the transportation requirements of the product, it also ensures that the product meets Canadian manufacturing standards. In the context of furniture, this refers to the prohibition of polybrominated diphenyl ethers. These chemicals are a group of fire retardants found in numerous products, including furniture. They are known to be persistent, to accumulate over time and are toxic. Unfortunately products manufactured in other nations may still contain these chemicals depending on their regulations.

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Option: Choose Latex Rather than Polyurethane Foam

Strategy: Substitution – Nature-like (SO 2)

The manufacture of polyurethane foam, often used in upholstered furniture, involves the reaction of an ingredient called toluene diisocyanate (TDI) with a polyol, an alcohol-based substance that has been created by a prior chemical reaction with methyloxirane (also known as propylene oxide). Both TDI and methyloxirane are carcinogenic chemicals. The best alternative to polyurethane in furniture is natural latex, a renewable resource derived from the rubber tree. It holds its shape well and lasts longer than polyurethane products. However it is more expensive.

Recently, some manufacturers have introduced soy-based polyurethane in an effort to address concerns about toxicity and uses of petroleum-based polyols. While greener than conventional polyurethane, it still poses problems. Soybean oil can only replace 5 to 40 percent of the polyol, so the remainder must still be provided by petroleum-based polyols. Furthermore, TDI is still used to create the final product.

Synthetic latex is also widely used in products. It does not pose a risk to consumers, but workers are exposed to a carcinogen — styrene — in the production process.

Option: Choose Natural Rather than Synthetic Fibres

Strategy: Substitution – Nature-like (SO 1, 2)

Synthetic fibres, such as polyester, are commonly used in upholstered furnishings. Many of these materials are made of petrochemicals, a non-renewable resource. Furthermore, they may release some of these chemicals into the indoor environment (sometimes called off-gassing).

Option: Avoid Plastic Foams using CFCs or HCFCs

Strategy: Substitution (SO 1, 2)

Since the ban of the production of Chlorofluorocarbons (CFCs) by the Montreal Protocol, the use of CFC blowing agents has been largely discontinued. However, products manufactured in countries that were not part of the Protocol may still continue to use them. Hydrochlorofluorocarbons (HCFCs) have largely replaced CFCs and are less damaging to the atmosphere. Carbon dioxide is also an alternative although carbon dioxide contributes to global warming.

Arriving at the currently preferred options

1. Identify the service

Furniture on campus is used for functional purposes, related to the work done on campus, comfort of occupants and aesthetics in campus buildings.

2. Assess the need

The University of Saskatchewan requires furniture for its residences as well as for business, academic and research activities.

3. Identify the contents

Furniture may be constructed out of **wood products** (including particle board), plastics (including laminates) and **metals**. Furniture may also contain **adhesives, fire retardants, varnishes and paints**. Upholstered furnishings include a variety of materials which may include **polyurethane** and petroleum-based synthetic **fibres**, such as polyester.

4. Identify sustainability impacts - If furniture is

necessary, how does it contribute to:

i.systematically increasing concentrations of substances from the earth's crust?

- **Fossil fuels** are combusted to provide energy during the extraction of raw materials, transportation, and production of furniture. The combustion of fossil fuels leads to an increase in concentration of substances extracted from the earth's crust in nature (CO₂, CO and SO_x). Increasing concentrations of these substances in nature can contribute to a number of negative effects such climate change and acid rain, as well as to negative human health impacts.
- **Petroleum** is also used as a feedstock for many synthetic fibres, such as polyester, as well as for polyol, a component of polyurethane. Petroleum is a material that is extracted at a rate much greater than it is can re-accumulate in the earth's crust. Petroleum is also used in the production of any plastic components, including plastic laminates.

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4. Identify sustainability impacts (con't)

- Most pure **metals** used in the construction of cabinets, furniture frames and mattress springs, come from the Earth's crust.

ii. ...systematically increasing concentrations of substances produced by society?

- Furniture contains adhesives, fire retardants, varnishes and paints which may contain volatile organic compounds (VOCs), formaldehyde, chlorofluorocarbons (CFCs), and hydrochlorofluorocarbons (HCFCs).
- Particle board, paint and adhesives may emit VOCs or **Volatile Organic Compounds**. These are carbon based chemicals, such as benzene, toluene and formaldehyde that evaporate easily at room temperature, and may cause health problems such as chemical sensitivities.
- Furniture, cabinets and building materials made from particleboard, medium density fibreboard and certain moulded plastics release small amounts of **formaldehyde** that may be inhaled or absorbed through the skin. The International Agency for Research on Cancer classifies formaldehyde as a probable human carcinogen. It is also suspected that formaldehyde causes allergic reactions in a significant part of the population.
- **CFCs** (Chlorofluorocarbons) were long commonly used as a refrigerant and a propellant for various products including plastic foams. **HCFCs** (hydrochlorofluorocarbons) have replaced CFCs and are considered somewhat less destructive in the atmosphere. However, both contribute to ozone depletion and also contribute to climate change.
- Upholstered furnishings may also contain polybrominated diphenyl ethers (PBDEs), chlorinated phosphate ethers (TCEPs), Toluene Diisocyanate (TDI) and Methyloxirane (Propylene Oxide).
- The manufacture of flexible polyurethane foam uses **toluene diisocyanate** (TDI) with a polyol, an alcohol-based substance that has been created by a prior chemical reaction with another ingredient called **methyloxirane** (also known as propylene oxide). Both TDI and methyloxirane are carcinogenic chemicals to which workers may be exposed in the manufacturing process. Both types of TDI used in foam manufacturing are classified as possible human carcinogens by the International Agency for Research on Cancer. It's not expected that consumers are directly exposed to TDI or Methyloxirane, although they could cause reactions as the polyurethane breaks down and becomes part of house dust. In addition, because polyurethane poses a fire hazard, fire retardants are often added.

iii. ...systematically degrading nature by physical means?

- Polyurethane and plastic products, such as plastic laminate, do not break down in **landfills**, adding to a long term waste problem. This contributes to the physical degradation of

nature through increasing amounts of land used for landfill.

- Wood products and production waste often end up in **landfills**. Ongoing reliance on landfills as a form of waste management will require more and more physical space, displacing and destroying natural areas and ecosystems.
- Wood is a commonly used material in the manufacture of furniture. Forest management practices that remove trees at a greater rate than they can re-grow or weaken local biodiversity and overall ecological health are unsustainable. Examples of these practices include **clear-cut harvesting** methods and **monoculture** planting. Clear-cutting has many disruptive effects including the reduction of biodiversity, the destruction of wildlife habitat, severe erosion of soil and increased flooding.
- **Mining** for metals can be destructive to local ecosystems. Impacts can include deforestation, displacement and disruption of animal populations and chemical pollution.

iv. ...systematically undermining people's ability to meet their basic human needs?

- In some instances, **forestry and mining** operations have infringed on the ability of local communities and indigenous peoples to meet their needs. Wood and metal are two of the main structural components of furniture.

5. Envision sustainable small appliances

Sustainability requires that materials be kept within **natural cycles** (where materials can be easily assimilated by nature) or tight **technical cycles** (where materials can be reused indefinitely in processes that do not move us away from our sustainability objectives). Sustainable furniture would not contribute to systematic increases of substances extracted from the earth's crust, or of human-made substances. Further, sustainably manufactured furniture would (1) not contain any substances that could systematically increase in nature or (2) involve processes so that these substances could be taken back and re-used entirely.=

Furniture would be from natural material that ecosystems can easily assimilate, or be 100% recycled. The **energy** used for extracting raw materials, producing and transporting the furniture would be generated from sustainable renewable sources in a carbon-neutral way, so that no carbon was allowed to systematically increase in the atmosphere and biosphere.

6. Identify and prioritize alternatives

To identify the best options, review the Current Options on page one and choose the most appropriate alternative by using the following three criteria for assessment:

- a) Does the product or service move us in the right direction with regards to our four Sustainability Objectives?
- b) Does the product or service create a flexible platform for the next step toward sustainability?
- c) Is the decision financially viable?

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Resources and Additional Information

1. United Nations – Montreal Protocol
http://ozone.unep.org/Publications/MP_Handbook/MP-Handbook-2009.pdf
2. EcoLogo Standard
<http://www.ecologo.org/common/assets/criterias/CCD-033.pdf>
3. Forestry Stewardship Council of Canada
<http://www.fsc.org>
4. Greenguard Certification
www.greenguard.org
5. Green Seal Certification
www.greenseal.org



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