



W O R K P L A C E G U I D E



Practical

Action

for the

Environment



Harmony

**"WHEN WE TUG AT A SINGLE THING IN NATURE
WE FIND IT ATTACHED TO THE REST OF THE WORLD."**

John Muir

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WORKPLACE GUIDE

PRACTICAL ACTION FOR THE ENVIRONMENT

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**"THE TRANSITION TO SUSTAINABLE DEVELOPMENT WILL BRING CHANGES THAT ARE
FUNDAMENTAL AND PERVASIVE IN NATURE."**

F O R E W O R D

BY MAURICE F. STRONG

The transition to sustainable development presents every organization with both challenges and opportunities, whether the workplace in question is a government department or a small business operating from an individual's sitting room. Sustainable development demands the continual pursuit of environmental excellence in management practices. Among the opportunities are the benefits of savings that are often to be made from environmental efficiency, as many of the examples in this volume demonstrate.

Change is imperative. It is increasingly recognised that we cannot continue to exploit the earth's resources in as inefficient and wasteful ways as the present industrialized societies have done to date, and that the earth does not have a limitless capacity to assimilate our wastes. There are many indications that the carrying capacity and resilience of the earth's natural systems are already approaching their limits. Put bluntly, the earth is incapable of supporting the global population of approximately twice today's numbers that demographers predict, if everyone adopts the resource-consumptive and waste-generative practices prevalent in the industrialised world.

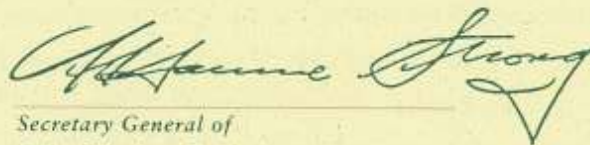
The transition to sustainable development will bring changes that are fundamental and pervasive in nature. They will affect virtually every sector of society. Similarly, almost every facet of an organization's activities impact on the environment: from the use of energy and water to cleaning the premises and disposing of wastes. Good management will make the critical difference in environmental impacts.

Many environmental problems are global in scale and demand international responses. But they are rooted largely in the behaviour of people and organizations at the local level. Environmental problems are systemic in nature, and the complex, linked chains of cause and effect generally mean that it is the accumulation of small-scale environmental transgressions that produce environmental risks of global scale. Thus the inefficient use of transport in a small organization contributes to global warming. The transition to sustainability will rest on individual action. Environmentally benign

practices in even a small organisation relieve, however marginally, the pressure on the biosphere. Also, they send signals to government that will encourage policies of pricing, systems of incentives and subsidies favourable to sustainable development.

Individual action must also be manifest in significant changes in lifestyles as more people in the industrialised world opt for lives of sophisticated modesty and people of developing countries receive greater support in their attempts to achieve livelihoods which do not undermine or destroy the environment and resource base on which their future livelihoods depend. This must be matched in the developed world by basic changes in consumer preferences and practices, which are already visible in the move towards green consumerism, and which demand of organizations providing both goods and services increasingly high environmental standards.

Once persuaded of the need for change and committed to action to bring it about, where to begin? This guide gives solid, practical tips on how to start an organization on the road to environmental excellence, with measures that will often be quick to show results and produce significant savings. I greatly commend initiatives such as this Workplace Guide from the Harmony Foundation that provide the detailed information and assistance necessary to inspire organizers of whatever nature to improve upon their environmental performance or to take the first steps to make a valuable contribution towards the transition to sustainable development.



Secretary General of
United Nations Conference on
Environment & Development

The United Nations Conference on Environment and Development (UNCED) will be hosted in Rio de Janeiro, Brazil, between June 1-12, 1992. This summit is the largest international conference ever organized. It is expected to involve participants from throughout the world, including many Heads of State, in the establishment of an environmental action plan for the 21st century.

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ORGANIZATIONS MENTIONED IN THIS PUBLICATION.

**WHETHER YOU HAVE BEEN INVOLVED FOR YEARS OR ARE JUST STARTING TODAY, WE
NEED EVERYONE WORKING IN THE CAMPAIGN TO PROTECT THE ENVIRONMENT.**

Robert Bateman, Honorary Chairman, Harmony Foundation



INTRODUCTION

The 1990s are the Environment Decade. Environmentalism has become a movement of worldwide force on the cutting edge of social reform. It is the most important issue for our economy — and our society as a whole.

Our challenge is to turn concern for the environment into positive action to protect the environment. We need to find ways to work together, to make good decisions, and to improve our environmental skills and practices.

Some organizations cling to old ways, convinced that this green fad will pass. Others allow doom-and-gloom scenarios or fear of failure to impede progressive action. Still others exploit marketing opportunities, while neglecting the environmental impact of their operations. Some, trying to respond too quickly, get criticized for efforts not well planned and delivered. Whether poorly informed or unable to clearly see which direction to follow, many organizations simply are not prepared for the challenges and opportunities ahead.

Gratefully, there are some inspiring success stories out there and some excellent, innovative initiatives. Workplace Guide: Practical Action for the Environment is designed to help more organizations respond effectively to the challenges and opportunities we face and thereby create positive change. It is about leadership and excellence and the benefits they provide. It is about what you can do where you work, whether at a large corporation, a school, a corner store or in your basement office.

Real leadership means not only expressing a clear position in favour of a healthy environment, but delivering on such promises. It means adopting practices that are environmentally sound in every aspect of organizational life, from the use of energy and water, to buying goods and services, to transportation, personnel, philanthropy and community service. It means staying well informed and training staff to be aware, skilled, dedicated and willing to share their environmental knowledge with others.

Canadians want to know what your organization is doing for the environment. They are becoming increasingly educated about environmental issues, and a large majority are prepared to support, politically and economically, major changes in how we live and work. They are asking tough questions about whether our businesses, governments, schools and other institutions, are taking serious action to protect the environment or are simply making token gestures because it is fashionable to be green. They want to know if your policies are consistent with your workplace practices, does the green vision extend to your senior management and internal operations or only those aspects visible to the public? Are environmental profits and savings in one area dedicated to an environmental fund and applied to other areas in need of action to

improve your overall environmental performance? Are you involved in meaningful professional, community and philanthropic activities to protect the environment? Do you communicate honestly about environmental achievements and deficiencies? In short, people want to know if your actions speak as loud as your words.

Environmental excellence is not a slogan. It is what we must seek and practise because the undeniable fact is that we simply cannot continue to exploit and waste the natural environment in pursuit of uncontrolled consumption and development. Our demands on the environment have reached such a critical point, our environmental deficit is threatening us with bankruptcy.

Workplace Guide: Practical Action for the Environment was developed to provide the inspiration, motivation, and tools to help your organization assess its environmental strengths and weaknesses, develop a strategic plan and implement improved environmental practices. It offers a comprehensive step-by-step approach to help you identify both economic and environmental benefits. It is about positive thinking, serious commitment and practical, cooperative action.

It also sets a standard for excellence that few, if any, have achieved. Do not be intimidated! Do as much as you can now, and keep going. We must all strive for the highest level of performance and help each other to achieve and improve upon our environmental goals. While the impact of any one office, school or business may seem insignificant, the cumulative effort of tens of thousands of workplaces will achieve substantial benefits and, combined with public and government actions, they are essential for success.

And succeed we must. In the period we are entering, the environment will play a major role in our decisions. Our choice is not between a healthy environment and a strong economy - these are inseparable. But, what we do or fail to do will determine the future of life on Earth. We can and must work together to choose a positive future.



MICHAEL BLOOMFIELD
Founder and Executive Director
October, 1991



HOW TO USE THE WORKPLACE GUIDE AND GET STARTED



IF YOUR WORKPLACE IS:

- a commercial office tower
- a retail chain
- the administration office of a school board
- an office in your basement
- a school
- a bank
- a hospital
- a corner store
- a small office
- a shopping mall ...

IF YOU ARE A(N):

- senior executive
- area manager
- concerned staff member

If... you want to make your workplace part of the environmental solution.. this Guide is for you.

ABOUT THE WORKPLACE GUIDE: WHAT THE CHAPTERS INCLUDE

QUICK START: at a glance it serves as an index and a quick reference to locate a few important improvements you can implement right away.

SHORT INTRODUCTION: outlines how poor workplace practices can waste money and harm the environment and the need for improvements.

TARGET AREAS AND ACTIONS: describe practical environmental improvements and how you can make them.

SUCCESS STORIES: provide a few examples of organizations that have gone before you and prospered, economically and environmentally — some extra motivation!

ENVIRONMENTAL NOTES: facts and figures you can use for improving environmental awareness.

SOURCES Contacts, resources, incentive programs and associations, specific to the topic, occur at the end of each chapter.

WHAT THE GUIDE ALSO INCLUDES

MORE SOURCES: contacts, incentive programs, government information, resource books, and associations, occur at the end of the Guide.

ACTION PLANNER AND ASSESSMENT WORKSHEETS: decide which Worksheets apply to your workplace. After profiling your current operations, record the areas needing action in your Action Planner. For ease of use, Worksheets and the Action Planner are grouped together toward the back of the Guide.

GETTING STARTED

It's important that you develop a program that is well organized and can be sustained. Poorly planned and overly ambitious programs can undermine your enthusiasm and success. Whether the initiative comes from senior management or concerned staff, long-term success requires the active and willing involvement of everyone.

WHY YOU NEED A GREEN TEAM

Team work is important and provides valuable peer support. By sharing the workload, much more will be accomplished and your effectiveness will be increased. It's important to do as much as possible but keep undertakings manageable. Therefore, form an environmental committee — a “Green Team” — set priorities emphasizing environmental benefits. Education and training will be instrumental in successfully implementing your environmental strategy. A strong awareness campaign is the first step in employee education (see “Education and Training” Chapter).

TOP DOWN AND BOTTOM UP AND EVERYONE INVOLVED

Patrick Kelly, General Manager of the Westin Hotel, Ottawa made a commitment to 'greening' hotel operations. Working with Harmony Foundation, the Westin Hotel established an environmental model for the hotel industry based on maintaining quality service while implementing environmental actions throughout their operations.

The spark started with Kelly, and like all success stories, quickly became a team effort. An environment committee was struck in the hotel, made up of staff from every area of operation.

(This cooperative project was supported by Environment Canada's Environmental Partners Fund). ◀

THE ROLE OF YOUR GREEN TEAM

- launch a staff-awareness campaign
- plan and coordinate team meetings and all workplace activities
- set goals, plan and conduct assessments
- make and evaluate recommendations for action
- coordinate and implement improvements
- monitor results and adjust practices as required
- follow environmental trends and programs — stay informed
- advise decision-makers
- involve and support environment groups
- consult with colleagues and competitors — share information
- tell the world with modesty
- keep co-workers and others informed

YOUR GREEN TEAM'S KEYS TO SUCCESS

- sponsored and supported by senior management
- kept a manageable size
- led by a coordinator — someone who is committed and relates well with people — a champion
- be sure the coordinator and members have sufficient work time approved to do a good job
- made up of members from all levels and areas of operation
- good rapport with their colleagues

Take a positive, enthusiastic and practical approach, encouraging manageable steps as part of an ongoing commitment.

THE STEPS TO ORGANIZE, ASSESS AND IMPROVE YOUR WORKPLACE PRACTICES

BEGIN WITH AWARENESS Before you conduct an assessment, launch a staff-awareness campaign — get everyone “on-side.”

By informing your employees/co-workers of the whys and wherefores of an assessment before you begin, you get them involved and plant the seeds of success...cooperation, communication and teamwork.

STAFF TEAMWORK

At the Royal Ottawa Hospital, The Rehabilitation Centre's volunteer staff committee started the green ball rolling. Julianne Labreche, chairperson of the Centre's Green Committee, reports that “on a rainy day in April, 1990, a small band of volunteer employees gathered at lunch to collect garbage from the grounds at the Centre.”

This Earth Day litter pick-up blossomed into a number of environmental initiatives for the centre and the hospital. Paper is collected for recycling, disposable dishes have been replaced with reusable items, the cafeteria offers a couple of free cups of coffee with the purchase of a reusable mug. On the Committee's agenda are eliminating pesticide use on

CONT'D

ORGANIZE AND CONDUCT A SUCCESSFUL ASSESSMENT Identify priority areas specific to your organization — for example, if you consume lots of energy but little water, make energy your first priority, addressing water later.

Assign responsibilities for conducting the assessment — share the workload. It's helpful to set up small teams for each area you plan to assess and a process for reporting back to the Green Team.

If necessary, get expert help. For example, if you own a large commercial building with a complex heating and ventilation system, or if your organization deals with hazardous materials consider bringing in specialists. Involve environment groups too, and offer your help in return.

Do the assessments, using the Worksheets found toward the back of the Guide.

STRIKE AN ACTION PLAN Record in the Action Planner the actions to be taken in each area. This provides a record of what's being done and who's doing it and is a useful tool for regular monitoring of your environmental performance.

Keep your plan realistic and set goals that are achievable. Improving environmental practices is an ongoing process; continued success requires a plan that will yield immediate and long-term benefits and give employees a sense of appreciation and accomplishment.

Work closely with people responsible for the areas of operation affected by your plan; coordinate your efforts and work together to develop a plan that is manageable, effective and tailored to your workplace.

Present your assessment report and action plans to senior management for support and approval.

Communicate your plan. This is a major first step to implementation and perhaps the most important. Communicate the plan to your co-workers: the objectives, the challenges, the benefits and the specifics of how they can participate — everything from tips on how to save energy to what can be put in the paper-recycling bin. Keep it simple, make it enjoyable — motivate.

And remember to ask your staff and colleagues for ideas to improve environmental performance. Their everyday experience and insights are invaluable.

IMPLEMENT YOUR PLAN Do it. The sooner you start, the sooner you will achieve the benefits.

Implementing the plan will be an ongoing effort moving from short-term to long-term initiatives. The best laid plans need some creativity and patience, so:

- work hard, but don't overdo it
- seek outside advice — but emphasize staff involvement

the grounds, encouraging employees to car pool and investigating composting of cafeteria kitchen waste.

Committed and enthusiastic employees took the first simple steps and quickly won over the administration — a bottom up, team effort. ◀

MONITOR THE RESULTS Periodically review your plan to see that recommendations have been carried out and are still effective. Be prepared to trouble-shoot: when actions have not been implemented or have been ineffective, determine why and how to remedy. Keep seeking to improve.

Monitor your results. Communicating progress to staff reinforces participation, provides motivation, and improves program support. Use easy to understand terms. For example, recycling 450 kg of fine paper saves 8 trees. Positive results act as incentives.

CONCLUSION

You have taken the first, perhaps the most difficult decision, to improve environmental performance in your workplace. Remember successful programs are based on teamwork, good planning, a serious commitment and manageable steps. Congratulations and good luck.

YOU LEASE ...

You lease the space where you work and want to improve your environmental performance.

There are many areas over which you have full control. You can begin in your office by reducing paper waste, turning off lights and equipment, replacing hazardous materials and encouraging your co-workers to 'green' commute.

But you want more. Help set up a joint tenants - building owner/manager environment committee to assess and implement further improvements. Most likely, you'll find a receptive audience. For more information see "Property Management" Chapter. ◀

E N E R G Y

QUICK START

What you can do, starting today, to save energy in your workplace.

Quick Start provides several easy-to-implement actions, providing excellent environmental benefits and potential cost savings.

QUICK START

FOR MORE INFORMATION

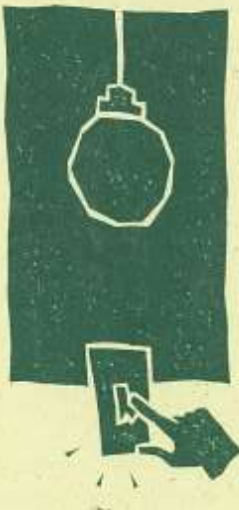
- | | |
|--|--|
| ■ Educate employees to turn off lights and equipment when not in use and when leaving at the end of the day. | Look for QS [symbol] on page 17 |
| ■ Remove unused fluorescent lamps. | Look for QS on page 17 |
| ■ Replace lights with energy efficient ones. | Look for QS on page 18 |
| ■ Set thermostats to 18°C during the heating season and 25°C when the air conditioning is operating. | Look for QS on page 13 |
| ■ Have your heating and cooling system serviced to keep it running cleanly and efficiently. | Look for QS on page 15 |
| ■ Caulk your building, especially around doors and windows, to reduce heat loss in winter and heat gain in summer. | Look for QS on page 16 |
| ■ Lower the thermostat on your hot water heater to 41°C. | Look for QS on page 19 |
| ■ Improve energy efficiency in travel. | See "Transportation" Chapter |

While you are developing a comprehensive environmental strategy and setting priorities for long-term goals, the Quick Start measures will help you get started. Implement as many of the target areas and options found in this chapter as possible.

IT IS FASHIONABLE TO SUPPOSE THAT WE ARE RUNNING OUT OF ENERGY, AND THAT THE SOLUTION IS TO GET MORE OF IT — AS IF THE MORE ENERGY WE USE, THE BETTER OFF WE ARE. BUT ASKING WHERE TO GET MORE ENERGY BEGS THE QUESTION OF HOW MUCH WE REALLY NEED.

Amory B. Lovins and L. Hunter Lovins
Rocky Mountain Institute

E N E R G Y I N Y O U R W O R K P L A C E



YOUR ENERGY USE IS COSTING YOU AND THE ENVIRONMENT

Energy is the life blood of our industrial society. It drives our commerce and industry, transports us and our products around the globe and heats our homes. Our every action consumes energy. In Canada, approximately 36 percent is provided by oil, and 26 percent by natural gas. Water power supplies another 12 percent, and nuclear energy, 9 percent. Coal is responsible for 11 percent, and renewables, such as biomass (tree bark and pieces) and solar, provide another 6 percent.¹

Canadians, the largest per capita users of energy in the world, have a voracious appetite. Some of this high level of consumption can be attributed to cold winters and long distances. However, much is due to poor conservation, caused by an abundance of sources. Unfortunately, we have chosen to emphasize sources which are polluting and non-renewable. Only now are we beginning to realize the real price of fuels and the steep price for us and the environment.

As more and more easily accessible energy sources are used up, such as oil and hydroelectric power, and as demand grows, the costs of development, transportation and pollution abatement keep increasing and are passed along to you. The price of oil, as our domestic supplies fail to meet demand, jumped from \$1.50 to a high of \$41 in 1979, levelling off to the current \$20 range.² The price of electricity in Canada grows annually at a rate of 5 to 8 percent.

Utilities now are finding that it is cheaper to assist their customers, with cash incentives and technical assistance, to practise conservation and improved efficiency than it is to build new generating facilities. No wonder. Where previously provincial governments had to borrow hundreds of millions to build electricity plants, today the cost is counted in the multi-billions for undertakings such as the James Bay hydroelectric project in Quebec. Programs providing rebates on energy efficient motors and lighting, or assisting organizations to assess and improve their energy use represent the best use of resources and achieve the goals of reliable supply and environmental protection far more effectively.

What we haven't counted — until now — is the profound impact of our energy development and use on the environment. Hydroelectric dams flood arable lands and harm downstream fisheries. Coal-fired thermal electric plants cause acid rain and toxic fallout. Nuclear power plants leave us with highly toxic radioactive wastes and the fear of nuclear accidents. Drilling for oil tampers with delicate ecosystems, and shipping oil

runs the risk of spillage. No matter how careful or conscientious suppliers of these resources are, accidents happen. Burning fossil fuels such as gasoline and diesel has given us a plague of air-pollution problems, from urban smog to the most dire, global climate change (see sidebar, below). We must be smart enough to develop an energy strategy which is secure, dependable and environmentally sound.

The most effective antidote to the rising costs and environmental damage of energy use is a three-point emergency plan: conserve what sources of energy we have by eliminating wastefulness; be more efficient in how we use energy by improving or changing processes, equipment and practices; use and encourage alternatives to non-renewable energy sources, such as solar, wind and geothermal.

Obviously, greater and greater legislative pressure may come to bear on energy use in the workplace. For example, the federal government discussion paper recommends that the federal government implement a new Energy Efficiency Act to set mandatory minimum standards for energy efficiency, as well as a permanent task force to look at increasing energy-efficiency requirements across all sectors, including commercial, institutional and industrial.¹ Why wait for that when you could be taking steps now to save energy and money and protect the environment from a very serious threat.

There are a host of measures — some simple, some more difficult — that will reduce your fuel consumption by thousands of litres and your electricity use by thousands of kilowatt hours, while brightening the future of our overtaxed environment.

You can begin to reap these benefits by formulating, then implementing a workplace energy action plan. But first contact your provincial hydro utility (see sidebar) to find out what technical and/or financial assistance is available to help you launch your plans.

YOUR ENERGY ACTION PLAN

Because there are so many ways energy is used in the workplace, subdivide your action plan into four categories: Your Building Envelope; Cooling and Heating - Your Workspace; Lighting Where You Work; Hot Water Systems. Target Areas and Actions are provided for improving and substituting your energy use. Read through them, then find out how many you can apply to your own workplace by conducting an assessment of energy use throughout your operations. You can do this yourself, using the Energy Assessment Worksheet, or obtain the services of a competent environmental consulting firm or environmental group or your hydro company.

GLOBAL CLIMATE CHANGE: EVERYBODY'S PROBLEM

Saving money — your money — is not the only potential benefit of saving energy, you can help save our world's climate from drastically changing. That's by preventing or reducing the emission of "greenhouse" gases, such as carbon dioxide (CO₂), which come from burning fossil fuels like oil, coal and natural gas. These gases act like a one-way

trap door — they let the sun's heat in, but they don't let it out when it is reflected off the earth, heading back to space. The result is a gradual global "warming," and all its potential repercussions: a rise in sea level, destroying many coastal regions; higher frequency of wind storms; significant changes in patterns of rainfall and snowfall. Among other

The Worldwatch Institute has found that "as much energy leaks through American windows every year as flows through the Alaskan (oil) pipeline".³

Area: ENVELOPE

**Action: AIR TIGHTENING
— PLUG THE LEAKS**

QS

Once you have assessed where and how you could improve your energy use, record the areas needing attention and the actions to be taken in the Energy Action Planner. Some measures you'll want to implement right away, others will need further evaluation, but first create a "Workplace Green Team" of participants representing each part of your organization. There are lots of ways to coordinate this, but involve staff and delegate (see "How To" Chapter). Assign a captain to every applicable Target Area and Action, and set dates for Green Team progress reports.

TARGET AREAS AND ACTIONS

YOUR BUILDING ENVELOPE

The building envelope, or shell, consists of the walls, roof and floor. It divides the controlled indoor climate from outside. As such, the envelope does not 'consume' energy but is a significant factor in the efficiency of your heating, cooling and ventilation system, and occupant comfort.

Some building materials used in the envelope, like insulating materials, contain and/or emit hazardous substances. These are covered in the "Hazardous Materials" Chapter. Service carefully.

Note: 'HVAC' is Heating, Ventilation and Air Conditioning.

- ☐ Seal cracks and gaps in window frames and doors, and ventilating systems that suck your building's air to the atmosphere. They can rapidly dissipate your moderated indoor climate.
- Weatherstrip all exterior doors and windows or replace them altogether with new airtight windows and doors; a more expensive, but ultimately cost-effective measure.
- ☐ Construct vestibules at all exterior doors. Vestibules act as airlocks, reducing the amount of air lost through exterior doors, and do not require HVAC. You can build them in the interior of the existing building, or as an addition on the outside.
- ☐ Install modern ventilating systems that filter and recycle indoor air, as well as heat-exchange or heat-recovery systems that strip the indoor air of its temperature before exhausting it to the outdoors. However, be careful not to create a "Sick Building Syndrome," where the air is not adequately filtered, goes stale and harms your employees' health (see sidebar). Adequate ventilation in the average office space is considered to be 20 litres of outside air, per minute, per person.⁴ It is best to consult an energy expert.

impacts, these developments could severely upset world agricultural production.⁹

Global climate change is a mega-environmental problem, almost too large to grasp by world leaders, whose climate specialists convened in 1988 to recommend that CO₂ emissions from fossil-fuel burning be reduced 20 percent below 1988 levels by the year 2005.

In Canada, total CO₂ emissions from energy use were estimated at 508 megatons in 1990. Those levels are projected to increase to 694 megatons by the year 2010, an average increase of 1.5 percent per year.¹⁰ ◀

- ☐ Install revolving doors where there is major pedestrian traffic. They release much less indoor temperature than conventional doors.
- ☐ Prevent temperature loss from loading dock areas by:
 - installing curtains of plastic strips and combined dock bumper-seal
 - partitioning the interior loading area from the rest of the building. This involves shutting off HVAC to the interior loading space, or installing an individual HVAC system to service this area.
- ☐ Prevent temperature loss through maintenance garage auto-service doors by:
 - installing electric eye door-openers/closers
 - installing a human-sized door in one of the garage doors, — enabling people to come and go without opening the larger door
 - wiring HVAC so that it shuts off when the doors open and comes on, as needed, when they close
 - using tailpipe exhaust tubes, vented to a scavenger, when work is being done on the vehicles.

Area: ENVELOPE

Action: REDUCE CONDUCTION

- ☐ Insulate foundations, walls, and ceiling/roofs. Get expert advice on the best materials and methods for upgrading your insulation.
- ☐ Replace doors and windows with insulated doors and with triple-pane, low-e glazed windows.
- ☐ Shade windows. Use removable awnings; install fixed lattice grills; plant deciduous trees on all but the north side (where it is best to create a wind-break using coniferous trees) and plant trees near the building — the latter is particularly useful for low structures.
- ☐ Block up unused and unneeded windows and openings. A single pane window has an RSI value (see sidebar on Insulation, this chapter) of approximately .16; insulate, cover and seal it and you can improve its RSI value by two or three times.
- ☐ In winter, close blinds or drapes at night to reduce heat loss, and keep them open on sunny days to maximize solar gain. Install awnings and/or insulating drapes to reduce heat loss. In summer, close blinds or drapes during hottest hours of direct sunlight to minimize heat gain.

GETTING HELP FROM YOUR LOCAL HYDRO UTILITY

It costs most provincial hydro companies anywhere from seven to nine cents per kilowatt hour (Kwh) for electricity from a new large generating station. If instead, a utility can spend the equivalent of four to six cents per Kwh helping your organization and other customers in the province to

save the equivalent that would have been produced by a new facility, it comes out ahead. In other words, it can “create” as much new electricity by saving it from wasteful use and redirecting it to new customers.

That’s why provincial hydro utilities such as BC Hydro,

If you are constructing a building, renovating or expanding your complex:

- ☐ Locate your new building to maximize its intake of free heat (energy) from the sun.
- ☐ Design your new building to maximize its intake of free heat, with as many southern-exposure windows and glass walls as possible. (see Sources)

COOLING AND HEATING - YOUR WORKSPACE

Heating, Ventilation and Air Conditioning, or HVAC is the system that keeps your workplace warm or cool, and supplied with clean dry or moist air. It accounts for about 60 percent of the energy consumed in a typical building.

Recent advances in HVAC operation and technology can cut your energy use (and its related environmental impacts), without sacrificing worker comfort or productivity. These measures cut your HVAC costs too.

Cooling systems often contain CFCs, chlorofluorocarbons, used in refrigerants and known to destroy the earth's ozone layer. CFCs are discussed in the "Hazardous Materials" Chapter.

Area: THE ACTIVE SYSTEM — HVAC

Action: REDUCE ENERGY CONSUMPTION

HVAC systems are fuelled by oil, natural gas, electricity and/or biomass. Heat or cold is transferred throughout your building by air or water.

Strategies for improving your HVAC system include:

- reducing energy use
- improving system efficiency
- upgrading with alternatives, like heat recovery, heat pumps
- ☐ Switch your fuel to natural gas. Electricity is by far the most inefficient and expensive energy source. The second most expensive is oil, which contributes to serious air pollution in most cities. Natural gas is a more efficient-energy source, is less polluting, and is the cheapest source of energy in Canada. The nuclear energy debate, especially the concern over radioactive waste, seriously affects this industry.
- ☐ Invest in automatic set-back thermostats to change HVAC settings to prescribed levels at predetermined times. These range from simple seven-day timers to sophisticated micro-computers. They cost more and require retrofit, but are essentially foolproof, therefore more efficient than manually set thermostats.
- ☐ Set thermostats to 18°C to 20°C during the heating season, and to 25°C to 27°C during the cooling season. Make changes gradually so that employees can adjust to different settings. Encourage appropriate dress for the season so that staff feel comfortable in these more moderate settings.

QS

Ontario Hydro and Hydro-Quebec are offering attractive financial assistance and incentives to encourage you to save electricity. For more information on the variety of programs and contact numbers, see "Sources". ◀

SICK BUILDING SYNDROME

On average, Canadians spend 80 to 90 percent of their time indoors, so protecting indoor air-quality is important.¹¹ Some buildings suffer from "sick building syndrome" — when the level of indoor air pollutants is a threat to the health and comfort of the office workers. Cigarette smoke,

CONT'D

- ☐ Invest in zone controls that allow you to vary the amount of heating and cooling delivered to different areas of your building. For example, zone controls can provide more cooling to the computer room, without freezing everyone else in the building, or provide less heat to storage areas. They are more expensive and require retrofit, but the energy savings are worth it.
- ☐ Turn your HVAC system down or off one half-hour before the majority of people leave. The building will stay warm or cool hours after the system is set back. Set your controls so that the system doesn't reach the desired settings until one half-hour after people arrive. Having just come in from outside, employees will feel comfortable during that first half-hour.
- ☐ Eliminate HVAC from unoccupied areas. Shut off vestibules and storage areas (this may require shutting off vents or valves; if there are no shut-off controls, ask your contractor to install them, or to tie them off completely).
- ☐ Reduce the use of exhaust fans where possible, keeping in mind employee health. Exhaust fans transfer inside air to the outside, meaning the fresh air drawn in to replace this exhaust air must be cooled or warmed depending on the season. At the same time, consider installing heat-exchange or heat-recovery systems to recapture and recycle heat from expelled air.
- ☐ While adjusting the thermostat settings for heating or cooling, make sure your ventilation system is providing good air circulation. It prevents employees from feeling drowsy (from warm, stuffy air); it prevents cool air from collecting near the floor.
- ☐ Install ceiling fans to circulate air. In summer, they help to reduce the need for air conditioners. In winter, slow-moving fans can push hot air (which rises) back down into the room, reducing the need to use the heating system.
- ☐ Bathroom exhaust fans can be wired to operate only when the bathroom is occupied and/or the light switch is turned on.
- ☐ Discourage the use of portable or baseboard electric space heaters. They draw an unusually large amount of energy to heat coils, and quickly run up the hydro bill.
- ☐ Discourage the use of unnecessary lighting and equipment in summer to reduce additional heat generation.
- ☐ Locate thermostats away from sources of heat and cooling. If they are unable to sense the average room temperature, they will react out of sync.

carbon dioxide (from human breathing), formaldehyde (given off by furniture and plywood, for example), chemicals emitted from building materials and furnishings, and fungi, viruses and bacteria all foul the air in your workplace. Common symptoms of sick building syndrome are headaches, fatigue, irritation, nausea, eye, nose and throat irritation, hypersensitivity, and so on.¹²

Since these symptoms are similar to those of many other diseases, it's difficult to connect them with sick building syndrome, or to detecting the actual source of the problem in the building. However, adjusting the ventilation and, where possible, sealing products that may emit indoor pollutants has helped to reduce symptoms. ◀

❑ If your building's windows open, use them in place of air conditioning during late spring and early fall, when it can be warm but not warm enough to warrant turning the system on. However, once your HVAC system is on (either to cool or to heat), do not counter your efforts to climate-control by opening windows.

If you have no air conditioning, leave the windows open at night during the hottest months to cool the building (assuming you have taken appropriate security measures) and close them during the day to keep the cool in.

Area: HVAC

Action: IMPROVE EFFICIENCY

If (any part of) your HVAC system is more than seven years old, or is energy inefficient to operate, then install a new efficient system. It can virtually pay for itself within the first three to five years, with the savings you'll gain from a lower fuel bill. For example, old heating systems deliver only 50 to 60 percent of the energy they use; the new systems are more than 90-percent efficient.

However, energy consumption can be improved significantly in any existing HVAC system simply through maintenance — of all its components. If your heating system is upgraded to improve efficiency, for example, but your duct work is leaky or heating coils not insulated, you will not get the best return for your heating dollars.

QS

❑ Have your central heating and cooling system tested, cleaned, tuned and adjusted annually. Your goal is to reduce incomplete combustion, which results in less heat output and more air pollution.

❑ Check gas burners once every two years, just before the heating season, and oil burners, once a year. Make sure nozzles are not clogged or worn, and that dampers are operating properly.

❑ Have soot removed from the boiler and heat transfer surfaces, when servicing your system. Soot prevents proper heat transfer, reducing efficiency.

❑ Replace or clean air filters regularly. Clogged filters make the unit work harder to circulate warm or cool air.

❑ Adjust air-duct registers to "balance" the air flow in your HVAC. Balancing simply means closing down (but not shutting completely) the registers closest to the source of heating/cooling, and opening up as much as possible those farthest away. This will more evenly distribute heating and cooling.

INSULATION

A well wrapped building is energy-wise.

Investigate how best to retrofit your building to upgrade its insulation — often periodic renovations and facelifts are the best time. When building, consider super insulation. The Rocky Mountain Institute, high up in the mountains of Colorado, is so well insulated that even on the coldest

winter days it is heated by the lighting and body warmth of the occupants.

Get expert help when retrofitting insulation or doing construction.

How well insulation keeps in the heat is measured in resistance units, known as RSI, where the higher the RSI, the better the resistance to thermal conduction. ◀

❑ Inspect steam traps once a year, and repair faulty ones immediately. Steam systems have traps to allow condensate to drain while preventing steam from entering the condensate-recapture channel. If these traps get stuck in the open position, the system will lose steam, wasting energy.

❑ Tape duct joints and repair insulation on ducts and steam/hot water pipes to ensure that your heating and cooling gets to where it's needed.

Area: HVAC
**Action: UPGRADE WITH
HEAT PUMPS**

Heat pumps provide both heating and cooling. To heat, it works like a refrigerator in reverse. A heat pump extracts warmth from the outside air and moves it inside. For cooling, it functions like a refrigerator.

❑ When you upgrade or replace your present HVAC system, consider installing a heat pump. Depending on your climate, a heat pump will provide all your needs, or may need to be supplemented on colder days. Heat pumps use CFC refrigerants. *Service carefully.*

Area: HVAC
**Action: UPGRADE WITH
HEAT RECOVERY**

Heat recovery is the recovery of waste or exhaust heat that may now be escaping out your chimney or stack. In a ventilation system, warm inside air is normally exhausted, but if recaptured, it can be used to pre-heat incoming air through a heat exchanger. Similarly, the waste heat recovered from your boilers can be used to pre-heat intake air or pre-heat domestic water supply.

❑ Pinpoint where your building now wastes heat — exhaust air, stacks, etc., and consider installing one or more heat exchangers.

LIGHTING WHERE YOU WORK

Lighting is essential for a productive and safe workplace. By following the guideline or rule of 'doing more with less', you can reduce energy consumption without compromising productivity and safety, and keep electricity costs down.

Lighting accounts for at least 40 percent³ of electricity consumed in a typical commercial building. The Electric Power Research Institute suggests that 55 percent of the electricity used for lighting could be saved through cost-effective means⁴. Ontario Hydro has demonstrated that improved lighting in commercial buildings can achieve an impressive 40 percent energy savings⁵.

For more help on lighting, contact your local or provincial utility, or the Canadian Association of Energy Service Companies (see Sources).

QS

AVOIDING ENERGY LEAKS

Air tightening requires sealing all the tiny cracks and openings where filtration takes place. The common trouble spots include:

- *around doors and windows;*
- *where the walls meet the foundation;*
- *where walls join;*

- *in the foundation itself;*
 - *around openings in the walls and ceilings, like air conditioners, recessed lights, and electrical conduits.*
- Caulking is used for sealing most cracks and openings. There are a wide variety of types and colours of caulking available on the market; caulking comes in interior and exterior grades and in types suitable to different conditions.*

Area: LIGHTING
Action: REDUCE USE

When you have the lights on, do you really need so much? And when no one is using the workspace, are the lights turned off? If you can't answer yes to both, there is energy and money to be saved.

QS

❑ Instruct, then remind employees and others using your facilities with posted signs to turn off desk and overhead lights (if they have access to lighting controls in their work area) when they don't need them.

❑ Reduce overlighting by lowering the brightness without impairing vision. Usually, more lighting is required in the office area of a workplace than, say, the warehouse section. However, both are frequently over-lit. Without jeopardizing safety, try reducing the wattage and/or number of bulbs in use.

❑ Install lighting "intelligence" that responds in a flexible manner to changing conditions. These include:

- time controls that turn lights in different parts of the workplace on and off at preset times
- sunlight sensors that turn lights off at daylight
- motion sensors that turn lights on, or up, when individuals enter a seldom used part of the building (e.g. warehouse storage or hotel room)
- make it possible and easy for employees to shut off lights. Upgrade your system so that you can turn on only those lights you need. Replace panel controls with wall switches. Locate switches so they are highly visible and at points of entry. Add additional switches to give you greater flexibility and zone control; this will allow you, for example, to turn off lights near windows, without turning them off further from the windows. You may need to rewire when you change switches.

QS

■ Remove unnecessary lamps, especially in areas where lighting is currently too bright. In fluorescent fixtures with more than one lamp, lamps are wired in pairs and must be removed in pairs. You can reap additional savings by removing the corresponding ballasts (ballasts draw a small amount of electrical current even when there is no bulb in place).

Note: Ballasts manufactured before 1978 contain PCBs. When removing them, refer to government regulations and guidelines. For more information on this, refer to Sources.

A dust-free, energy-saver 34w fluorescent bulb probably delivers as much light as a regular, but dusty, 40w bulb. Thus, keeping your bulbs dust-free may allow you to install energy-saver bulbs, without reducing the amount of light available at work stations.

Some types give off fumes that may be hazardous, both during application and while (first) in use. Your building supplier or contractor can advise you on the type best suited to your needs. Caulking does deteriorate over time; when it does, it should be removed and replaced.

Weather stripping is used to seal doors and windows that open and close; weather stripping creates tight fitting doors

and windows and comes in a variety of styles and materials. Doors and windows that do not open should be caulked. In some cases, old windows and doors, those that rattle in the breeze, are so leaky that the frame and weather stripping are beyond repair; these units should be replaced. When replacing these units, insist on thermal windows and insulated doors. ◀

Area: LIGHTING

**Action: UPGRADE WITH
ENERGY-EFFICIENT
ALTERNATIVES**

It would cost \$32,240 a year to light a 35,000-square-foot commercial area with mercury fluorescent, while it would cost just \$8,175 to light the same space with dust-tight metal halide lamps based on .05¢/Kwh with bulbs burning 5000 hours/year.²⁰

Standard office lighting consists of 40W fluorescent tubes with electromagnetic ballasts.

Where possible, upgrade your lighting to energy efficient fluorescent tubes (34W), electronic ballasts and highly reflective luminaries or fixtures. Your savings over 'standard' lighting will be substantial.

Consider full-spectrum fluorescent lamps for areas where employees will be working all day. They are about 20 percent more expensive than other types of fluorescents, but produce a more natural, healthier quality of light. Unfortunately full-spectrum lights are not yet available in energy-efficient models.

When it is not possible to convert to energy-efficient fluorescent tube lighting, replace the familiar round incandescent bulb with the new compact fluorescents. They screw into a regular socket like an incandescent and are only slightly longer. Suppliers now provide globes and long hard frames to accommodate these slightly longer compact fluorescents. An 18 watt compact fluorescent provides the same amount of light as a 75 watt incandescent bulb. It costs about 10 times as much to purchase, but last 10 times longer. In the long run, and taking into account energy consumption, compact fluorescents are more cost effective than incandescents.

QS

Choose broad-spectrum energy efficient fluorescents for areas where there is intermittent or sporadic use, such as in a warehouse. Of broad-spectrum choices, open metal halide fluorescent lighting is preferred. It provides a better colour spectrum and is at least twice as efficient as the older, more common type using mercury vapour. Better still are enclosed dust-tight metal halide lamps, which improve efficiency four-fold.

□ Review all lighting. Upgrade to energy efficient fluorescent tube (long-tube) systems where possible; to compact fluorescents where appropriate and; to metal halide lighting in warehouses, outdoor areas, etc.

Area: LIGHTING

**Action: MAKE BETTER USE
OF DAYLIGHT**

- keep the drapes open during daylight hours. Remember to close them on winter nights to help keep the heat in.
- rearrange your office layout to take advantage of natural daylight.
- when you decorate, select light colour paints and coverings for walls and ceilings and light colour fabrics to reflect and improve the use of daylight.
- when you renovate and/or construct a new building, design your workspace to make best use of natural light (install tinted, low-e triple glazed windows).

FLUORESCENTS AND YOUR HEALTH

Some types of fluorescent lighting emit certain light waves that can affect the brain patterns of people, causing what is called "seasonal affective disorder" (SAD). To avoid the disorder make sure you install full-spectrum fluorescent bulbs in heavy use areas. These provide light patterns that are much like outdoor light.

As well, many fluorescent lights contain small amounts of mercury. So you must take care not to break them and to dispose of them properly at the end of their useful life. Caution: If your organization has old fluorescent light fixtures, the ballasts may contain PCBs. If you find oil leaks from these fixtures, or if you are planning to replace them, contact your provincial Ministry of the Environment. ◀

HOT WATER SYSTEMS

Hot water is used in offices and building operations for a number of purposes including washrooms, showers, cooking, dishwashing, and laundry. In some buildings with restaurants, and in hotels/motels, hot water is a significant portion of total energy use.

This Section deals with how to reduce your energy costs for heating water. Reduction of water use is dealt with in the "Water" Chapter. Many of the measures that cut energy use for hot water will reduce water consumption in general.

Area: HOT-WATER SYSTEM

Action: REDUCE ENERGY USE

There are four main ways to reduce energy use in the hot-water system: by using less hot water, so there is less to heat; by turning back temperature settings and shutting off the system when it's not needed; by improving the efficiency of your current system; and by reducing heat losses in the system through insulating the tank and pipes.

- ☐ Repair leaks in the system. Leaky pipes, leaky faucets and inoperative valves waste water, wasting energy. All joints should be tight. Faucet washers may need to be replaced. Faulty valves should be repaired or replaced.
- ☐ Install low-flow showerheads and flow restrictors with aerators on faucets to cut the flow of water. Some low-flow showerheads use half the water that a regular head uses.
- ☐ Install automatic shut-off faucets, (see "Water" Chapter), to ensure that faucets are not left on inadvertently. Some of these are operated by foot valves; some have a delay so that when you release the faucet handle the water runs for a predetermined time before shutting off.
- ☐ Shut off, or close down hot-water circulation to areas when it is not needed. Install a timer to shut off circulation pumps at night and on weekends.
- ☐ Turn off water heater when you are closed for two days or more (weekends and holidays). Install a seven-day timer to shut the system off on weekends.
- QS** ☐ Set back temperature settings on your hot water system. Consider installing boosters for special needs like dishwashing. Recommended temperatures are 41°C for handwashing and showering, 71°C for laundry and 82°C for dishwashing (rinse).³
- ☐ Switch to cold-water cleaning materials (laundry and dishwashing soaps) that are effective in cooler water, enabling you to turn your settings down even lower and draw less hot water. (See Phosphate sidebar in "Hazardous Materials" Chapter.)
- ☐ Heat water or use hot water during off-peak hours. If your water is heated by electricity, you are probably paying extra charges when you use electricity during peak demand. Schedule activities like laundry during off-peak hours, or heat your water during off-peak hours and store it for use during peak times. Install a timer that restricts the operation of your heater to off-peak hours.
- ☐ Repair or install insulation on the hot-water tank and distribution pipes. Insulating jackets and pipe wrap will cut stand-by losses. If your tank is warm to the touch, it needs more insulation. If your tank is gas-fired, use only a certified retrofit kit; get advice from your contractor.

Area: HOT WATER

Action: IMPROVE EFFICIENCY

There are two ways to get the most out of every bit of energy: good operational practices and improved equipment.

A water heater that is well maintained and properly adjusted burns cleaner and more efficiently.

- ☐ Test and adjust fuel-fired heaters to give maximum energy efficiency, while minimizing the amount of waste heat going out the stack and ensuring that stack emissions are as clean as possible.
- ☐ Clean out sediment. In tank-type heaters, sediment accumulates, on the bottom of the tank, acting as an insulator to inhibit the transfer of heat from the heating elements to the water.
- ☐ Replace tankless coil heaters with more efficient tank heaters. These tankless coil systems have virtually no storage and operate on demand — even when you need just a small amount of hot water, the system must operate.
- ☐ When installing new water heaters, install them close to the point of use. This will reduce stand-by losses in long runs of distribution pipe. Investigate the use of several, small storage type heaters, one for each point of use (for example, one in each bathroom); this may be more efficient than a system with a large central heater and long distribution pipes to a few, remote points.
- ☐ If your heater is electric, consider switching to a gas-fired heater. (Gas is a more efficient fuel than electricity or oil.)

Area: HOT WATER

**Action: INSTALL
ALTERNATIVES**

There are several, proven technologies that use renewable energy for heating water.

Solar heating uses south-facing collector panels to absorb the sun's energy and to pre-heat water. Most solar systems require supplemental heaters to boost the temperature of the solar pre-heated water to the desired temperature and to provide back-up on cloudy days.

Heat pumps are also used to heat water.

Heat recovery systems take waste heat and use it for a variety of purposes, including pre-heating water. Waste heat can be recovered from boiler stacks, grey water (warm waste water), cooling towers, refrigeration units and industrial processes.

- ☐ Determine sources of waste heat and investigate how these might be harnessed to pre-heat water.
- ☐ Consider installing a heat pump water heater.
- ☐ Consider installing solar hot water heating.

OFFICE EQUIPMENT

Computers and photocopiers represent the fastest growing component of energy use in the commercial sector.

Investigate ways to reduce energy use and to purchase equipment that is more efficient.

Area: OFFICE EQUIPMENT

Action: REDUCE ENERGY USE

Ten to fifteen years ago, energy use for office equipment accounted for less than 1 percent of total energy use in the typical office building, whereas today, it is 10 to 20 percent. Energy use for equipment is the fastest growing end-use in a sector (commercial) that is the fastest growing sector in total energy use.

☐ Turn off computer terminals at night and on weekends, unless they are on an essential network. Your computer terminal energy demand will drop.

☐ Reduce the use of photocopiers. Think first. Do you need to copy and do you need as many copies as you think?

☐ Turn off photocopiers at night and on weekends. Your photocopier energy use will drop by nearly 70 percent.

☐ Use dot-matrix printers for draft-quality "internal" documents, saving laser printers for high-quality jobs. Dot-matrix printers use up to 85 percent less energy than lasers.

☐ Use colour computer screens only when the need dictates. They require twice as much energy as black and white.

☐ Instruct, then remind employees with posted signs to turn off computer peripherals such as screens and printers when not in use for 10 minutes or longer. Be sure to turn them off at night and on weekends. Appoint an equipment monitor to check these and other machines are off when not in use.

Area: OFFICE EQUIPMENT

Action: UPGRADE WITH EFFICIENT EQUIPMENT

☐ Upgrade to photocopiers with a "stand-by mode," which consumes up to two-thirds less energy than conventional models. The stand-by feature cuts the machine back to maintenance power if it sits unused for a set period of time, but can quickly reach full power the next time it is needed.

☐ Purchase laptop computers where appropriate. They are more versatile than PCs, and draw one-tenth the power for the same performance level. Use battery power only when absolutely essential.

☐ When buying any new equipment, shop around for those with the lowest energy consumption and with energy saving features.

MOTORS AND MACHINES WHERE YOU WORK

For many organizations, motors and machines may be a surprisingly large part of your total energy use. Hotels use energy to run elevators, do the laundry, and cook meals; bakeries need energy to fire the ovens, and print shops need energy to run their presses. Match equipment to the job, and make sure all equipment is turned off when not in use.

Note: This Section does not cover process energy in industrial operations.

Area: MOTORS AND EQUIPMENT

Action: REDUCE ENERGY USE

☐ Install automatic clock-timers that shut down equipment when it is not needed, or switches that shut down equipment when it is not in use.

☐ When replacing equipment, purchase new equipment with automatic shut-off switches and timers.

☐ Use lower temperatures on all heating and washing equipment and higher temperature settings on all cooling equipment.

☐ Use cold water detergents so that you can select cold water cycles for washing.

☐ Where possible, avoid washing small loads and cooking small portions.

☐ With elevators, shut down some or all during periods of low or no demand. If elevator motors are set to run continuously, install automatic controls that shut down the motor when there has been no call for it for a predetermined period of time.

Area: MOTORS AND MACHINES

Action: UPGRADE TO IMPROVE EFFICIENCY

It is estimated that motors account for 47 percent of the electrical energy consumed by the commercial and industrial sector in Canada, and up to 70 percent in manufacturing-rich Ontario.¹¹

Motors used to run elevators, printing presses, blowers, pumps and conveyors are now available in energy efficient models. They may cost more but they save energy (with good pay-back) and are good for the environment. They generate less heat and therefore tend to last longer — an added bonus. They are best suited to situations where they run fairly continuously, under fairly constant loads and with a required horsepower of 15 or more.

Cooking, washing and drying equipment come in a wide range of efficiencies and with a variety of energy saving features.

Keeping all your equipment clean and in top running order makes it more efficient. For example, keeping the condenser coils of all cooling equipment clean, and fixing leaks in compressor hoses and connections, improves efficiency.

- ☐ Clean, maintain and adjust all equipment regularly and frequently.
- ☐ Replace burnt-out and inefficient motors with energy efficient ones.
- ☐ Match the motor to the job — many motors are oversized using an average of only 50 percent of the motor's peak efficiency.

SUCCESS STORIES

CARLETON UNIVERSITY Ottawa, Ontario, has implemented a ground water energy system, which is one of the largest in North America. The installation complements conventional heating and cooling systems to service nine campus buildings. Heat from underground water is extracted in winter by using heat pumps, and in summer heat is transferred to ground water, to cool buildings. Financial and environmental benefits include:

- substantial savings through reduced fuel consumption. In 1990, Carleton's energy costs were reduced by 60 percent resulting in a saving of \$450,000
- a decrease in use of non-renewable resources and in pollution caused by burning fossil fuels, and
- an elimination of the need for cooling towers and their associated chemicals.¹²

WATERLOO FAMILY YMCA At the YMCA, waste heat provides 37 percent of its water heating needs. A heat pump extracts waste heat from ventilation exhaust air and uses it to pre-heat hot water, used primarily for showering in the Centre. Savings are 121,000 kWh annually.

ST. PAUL'S ANGLICAN CHURCH Built in 1912 in Dauphin, Manitoba, the Church was no energy saint. In 1984, St. Paul's conducted an energy audit and implemented measures to improve conservation and efficiency and reduce costs by 30%:

- loose fill insulation was blown into walls;
- rotting storm windows were replaced and all windows sealed;
- double panes of plexiglass were installed over stained glass windows;
- all exterior doors were weather stripped;
- building temperature was set back when the church was unoccupied.

Energy savings through Power Smart (BC Hydro's campaign for efficient energy use) are calculated as the cheapest form of electricity at 2.4 cents a kilowatt hour. As a result of these initiatives, the contentious Site C dam proposal for the Peace River in Northern BC has been postponed indefinitely.¹³

TOYS 'R US has a half million square foot distribution centre in Concord, Ontario. The company installed a Keene-Widelite HiLo Lighting System. This system allows high/low switching of HID high-pressure sodium lamps that are controlled by an infrared, automatic occupancy detector system. When someone crosses the infrared beam, the lights in that section switch from low to bright. Studies show that the aisles in a typical warehouse are unoccupied 70 percent of the time - good targets for this kind of energy savings.¹⁴

SOUTHERN CALIFORNIA EDISON provided 450,000 fluorescent lamps to low-income ratepayers, which displaced eight megawatts of generating capacity, and cost less than building a new energy facility.¹⁵

CANADIAN TIRE CORPORATION has found it possible to cut lighting loads in half in its retail stores with no measurable impact on sales volume.¹⁶ The installation of photocells to replace manual on-off switching for outdoor lighting at service stations has cut electricity consumption by as much as 45 percent.¹⁷

AGROPUR DAIRY of Notre Dame du Bon Conseil, Quebec introduced a two-part plan to energy consumption. First, it upgraded its plant to improve efficiency, consuming only 98 kW, versus a comparable, but conventional dairy's use of 2000 kW. Second, it installed two anaerobic wastewater treatment systems in 1986 to use dairy waste from cheese-making to produce methane gas. In 1990, the dairy produced a volume of methane worth \$30,000, and enough to power its plant.¹⁸

THE SHERATON CENTRE, in Toronto is doing more with less, and pocketing the difference. The Sheraton Centre is 139,000 square metres of hotel, conference facilities, and retail outlets. Between 1984 and 1989, the Centre's total average, annual energy savings were worth \$1.2 million. How? The efficiency steps introduced include: using steam condensate in the Centre's laundry and decorative water fall, installing low-flow showerheads and automated building-climate controls and improving cooling tower performance-proving that saving energy is good for the environment and good for business.¹⁹

FOOTNOTES

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- ¹⁴ "Warehouse Maximizes Energy Savings," by Mark Biefer, in *Electrical Equipment News*, Don Mills, February, 1991.
- ¹⁵ *Building On Success: The Age of Energy Efficiency*, Worldwatch Paper 82, Christopher Flavin and Alan B. Durning, Washington, DC, March 1988, p.21.
- ¹⁶ *Zero Energy Growth for Canada*, David B. Brooks, McLelland and Stewart, Toronto, 1981.
- ¹⁷ ibid, Brooks, 1981.
- ¹⁸ *Success Stories Bank Towards Sustainable Development*, Environment Canada, Sustainable Development Branch, November 8, 1989.
- ¹⁹ *Ontario Energy Network* Vol.9, No.4, Association of Municipalities of Ontario (AMO), Toronto, Summer 1989.
- ²⁰ "Energy Management Drive Means Opportunities for Contractors," by Martyn Timmings, in *Electrical Business*, Mississauga, March 1991, p.16.
- ²¹ op. cit., Flavin and Durning, March 1988.
- ²² "Energy Management," in *Electrical Equipment News* Vol.35, No.4, April 1990.
- ²³ *The Financial Post*, March 25, 1991.

SOURCES AND REFERENCES

The availability of information in both French and English varies depending on its source and purpose. References and publications are presented in the language in which they were provided.

NATIONAL

Solar Energy Society of Canada Inc.
15 York St., Suite 3
Ottawa, ON, K1N 5S7
(613) 236-4594.

Publishes *Sol* magazine. Bi-monthly.
\$40 per year (tax-deductible).

The Canadian Association of Energy
Service Companies (CAESCO)
46 Lauralynn Crescent
Agincourt, ON, M1S 2H5
(416) 292-2508

CAESCO promotes the benefits of
building energy efficiency and provides
information on trends in the energy
service industry.

FEDERAL

Energy Publications
Energy, Mines & Resources, Canada
580 Booth St.
Ottawa, ON, K1A 0E4
(613) 996-5419

The department produces general
publications (free of charge) on energy
efficiency, conservation and alternative
energy in the home and personal
transportation. The department also
publishes a series of energy-management
manuals for industrial managers and
plant operating personnel. EMR is
involved in extensive technical research
with industry in these subject areas; for
more information or to order materials
write to the above address.

BRITISH COLUMBIA

Power Smart Program
B.C. Hydro
970 Burrard St.
Vancouver, BC, V6Z 1Y3
(604) 293-7777;
(toll free) 1-800-663-0431

B.C. Hydro's Power Smart Program is
aggressively encouraging its customers to
convert to energy-smart operations and
equipment. For the commercial sector,
there are a number of initiatives offering
technical information and assistance, on-
site audits, rebates and other incentives:
Energy Efficient Lighting Program;
Building Improvements Program; *Energy*
Management Control Systems Program;
Economizer Pilot Program (economizers
on air-conditioning units); *New Building*
Design Program; *Commercial Water*
Heating Conversion Pilot Program (to
natural gas); *Municipal Electrical*
Efficiency Program, which offers similar
assistance and incentives to the industrial
sector, through *High-Efficiency Motors*
Program; *Efficient Fans Program;*
Pumping Profits Program (pump systems);
Efficient Compressed Air Program; *New*
Plant Energy Assessment Program;
Efficient Roadway Lighting Program.

ALBERTA

Director, Industrial Section
Department of Energy
9945 108 St.,
Edmonton, AB, T5K 2G6
(403) 427-5200

The department's many initiatives include:
Energy Audit Program, which will
conduct on-site audits for all types of
energy users, including commercial vehicle
fleets (but excluding single family homes);
Alberta Energy Saver Booklet Series for
Business and Industry, nine booklets on
the fundamentals of energy management;
Energy Management Seminars,
presentations given on request about
energy management and energy audits.
The department also provides programs
and publications promoting fuel economy

for commercial and industrial
transportation, as well as information
and funding for renewable energy projects.
The Energy Matters Telephone Service
provides technical assistance to the
public, housing industry and government
agencies on energy conservation. Call
(403) 427-3300.

SASKATCHEWAN

Manager, Energy Conservation
Sask Power
2025 Victoria Ave.
Regina, SK, S4P 0S1
(306) 566-2842

Sask Power's *Farm Yard Light Conversion*
Program offers low-interest loans to
encourage conversion from mercury-
vapour lighting to High-pressure sodium.
The *Heat Pump Program* also provides
incentives to switch to energy-efficient
heat pumps. The following programs are
currently informational only, but may be
expanded to include financial incentives:
Commercial Parking Lot Timer Program,
Commercial Lighting Program, *Energy*
Efficiency Motors Program and
Applications for High Intensity Discharge
Lighting Program.

MANITOBA

Director, Energy Management
Manitoba Energy and Mines
555-330 Graham Ave.
Winnipeg, MB, R3C 4E3
(204) 945-2694

Manitoba Energy and Mines has several
programs for energy management,
including *Research/Demonstration*
Program, which funds conservation
projects in all sectors, including the
production and use of alternative energy.

Director, Energy Programs Transportation
Manitoba Energy and Mines
555-330 Graham Ave.
Winnipeg, MB, R3C 4E3
(204) 945-6827

Pro Trucker Program advises the trucking
industry on fuel efficiency.

Manitoba Energy Audit Program
Manitoba Energy and Mines
555-330 Graham Ave.
Winnipeg, MB, R3C 4E3
(204) 945-4154;
(Toll free) 1-800-282-8069

Manitoba Energy Audit Program provides no-cost energy audits to institutional, commercial, industrial and agricultural facilities.

Department of Energy Management
Manitoba Hydro
820 Taylor St.
Winnipeg, MB, R3C 2P4
(204) 474-3311

Manitoba Hydro is currently developing a variety of demand-side management programs. These programs, delivered under the name of *Power Smart*, will consist of information transfer and financial incentives, available to all Manitoba Hydro customers. Brochures and information sheets on energy conservation are available.

ONTARIO

Manager
Energy Technology Development
Ministry of Energy
56 Wellesley St. W.
Toronto, ON, M7A 2B7
(416) 327-1253

EnerSearch is a multi-year program assisting the private sector in the research, development, testing and initial demonstration of innovative energy-related technologies in Ontario.

Manager, Industry Programs Section
Ministry of Energy
56 Wellesley St. W.
Toronto, ON, M7A 2B7
(416) 327-1457

Industrial Energy Services Program provides impact advice on equipment-process improvements, as well as on-site

comprehensive energy audits, feasibility study grants and project engineering-design grants. Through *Industrial Process Equipment Demonstrations Program*, the ministry cost-shares demonstrations of new energy-efficient technologies.

Manager, Energy Efficiency Section
Ministry of Energy
56 Wellesley St. W.
Toronto, ON, M7A 2B7
(416) 327-1477

Commercial Buildings Energy Management Program, in conjunction with local Chambers of Commerce, holds Cities Energy Forums for commercial and municipal building owners and managers, and Downtown Energy Forums for commercial building owners and managers in large cities. *Institutional Energy Management Program* provides training and audit grants to managers/operators of institutional facilities, and *Municipal Buildings Energy Efficiency Program* offers similar incentives to the municipal sector. *Transportation Energy Program* supports the development and demonstration of new energy-efficient technologies, as does *Commercial Buildings Training and Technology Transfer Program*.

Public/Institutional Programs
Ministry of Energy
56 Wellesley St. W.
Toronto, ON, M7A 2B7
(416) 327-1486

Energy Education Program provides workshops, conferences, and curriculum documents for teachers, and is piloting student-run audit projects in high schools. As well, there are energy programs and a newsletter, *Energy Alert*, for the general public at the Kortright Centre for Conservation, near Kleinburg, Ont.

Manager, Commercial Programs
Ontario Hydro
700 University Ave.
Toronto, ON, M5G 1X6
(416) 592-3863

Commercial incentives include: *Streetsmart Program*, to convert municipalities to energy-efficient street lighting; *Thermal Cool Storage Program*, to buy systems that shift the cooling and air-conditioning load of large commercial buildings to off-peak hours. *Savings by Design Program*, to incorporate energy-efficiency features into new facilities or renovations.

Supervisor, Program Support
Ontario Hydro
700 University Ave.
Toronto, ON, M5G 1X6
(416) 592-8257

Energy Efficient Lighting Program offers incentives of up to one half the cost of installation to commercial and industrial customers who convert to energy-efficient lighting.

Manager, Industrial Programs
Ontario Hydro
700 University Ave.
Toronto, ON, M5G 1X6
(416) 592-3871

Accelerated Paybacks Program offers a shortened payback period to industrial customers who move to energy-efficient process design or equipment. *High Efficiency Motors Program* provides incentives for buying high-efficiency motors. *Energy Monitoring Program* is a scheme jointly operated with Ministry of Energy to install 12 energy-monitoring systems across a wide range of industries to determine the potential of overall energy savings.

Program Services
Ontario Hydro
700 University Ave.
Toronto, ON, M5G 1X6
(416) 592-8634

Power Savers Program provides on-site audits of customers' operations, determining their energy-use patterns and areas of possible savings.

Manager, Rate Structures
Ontario Hydro
700 University Ave.
Toronto, ON, M5G 1X6
(416) 592-3751

All large industrial users and several municipal utilities can take advantage of *Time of Use Rates Program* to shift some of their consumption to off-peak times, saving money and reducing peak demand. **Note:** Ontario Hydro will entertain project-specific proposals for energy conservation.

QUÉBEC

Chef de division, Service des Programmes
Bureau de l'efficacité énergétique
Ministère de l'Énergie et des Ressources
425, avenue Viger Ouest, Bureau 600
Montréal, PQ, H2Z 1W9
(514) 873-5463

Technology Transfer Program Industry-Commerce develops case studies, produces newsletters and organizes workshops with trade associations and other organizations. *Energy Productivity Program* provides free energy audits to industries and institutions whose energy costs exceed \$25,000 a year, and *Feasibility Study Grant Program* covers up to 60 percent of the cost of examining the feasibility of audit measures.

Chef de division, Service Conseils et Information
Bureau de l'efficacité énergétique
Ministère de l'Énergie et des Ressources
425, avenue Viger Ouest, Bureau 600
Montréal, PQ, H2Z 1W9
(514) 873-5463

School Program develops energy curriculum for primary and secondary schools. *Building Energy Conservation Forum* organizes seminars and workshops for owners and administrators of commercial buildings.

Directeur, Ministère de l'Énergie et des Ressources
5700, avenue 4^{ème}
Charlesbourg, PQ
(418) 643-4561

Programs of RDD in Renewable Energy: Passive Solar, Active Solar and Photovoltaics, Energy from Waste, Forest Biomass, Hydrogen, Small Hydro Plants provide financial assistance to industries, institutions and individuals carrying out RDD (Research, Development & Demonstration) activities involving renewable energy. Eligible projects range from feasibility studies to RDD work, including publication of results.

Chef de service
Recherche et Planification des marchés
Hydro-Québec
1010, rue Sainte-Catherine Ouest,
Montréal, PQ, H3C 4S7
(514) 289-3378

High Efficiency Accessories Program subsidizes the development of everyday energy-smart accessories, including reduced-flow shower heads, more efficient lighting fixtures, flow-filters for faucets, block heater timers and programmable thermostats. Evaluations of existing or expanding facilities are available through *Pre-Renovation Energy Analysis Program* and *Energy Analysis: Hydro-Quebec Buildings, Institutional Buildings, Large Commercial Complexes, Industrial Customers Program*. Hydro-Quebec

also distributes general education through its *Introducing Energy Efficiency to Industry Program* and *Energy Efficiency in the Schools Program*.

Chef de division, Programmes Commerciaux - Montréal
Hydro-Québec
1010, rue Sainte-Catherine Ouest,
Montréal, PQ, H3C 4S7
(514) 289-3711

Help Program for Electrotechnologies Implementation offers technical and financial aid to extracting and manufacturing industries, as does *High Performance Motor Installation Program* to the industrial, commercial and institutional sectors. *Customer Energy Initiatives - Small and Medium Enterprises (Commercial and Industrial) Program* targets main energy-use applications, such as water heating and lighting, in these businesses. *Customer Energy Initiatives - Industrial Processes Program* improves the efficiency of industrial processes. *Energy Efficiency R & D Program* conducts or commissions research, development and demonstration of energy-consuming accessories devices and processes.

NEW BRUNSWICK

Senior Engineer, Energy Branch
New Brunswick Natural Resource and Energy
P.O. Box 6000,
Fredericton, NB, E3B 5H1
(506) 453-7432

Natural Resources and Energy's *Wood Energy Program* fosters the energy value of residual wood from forest and industry through resource assessments, economic evaluations, demand studies, development and demonstration projects, technology transfer and promotion. *Provincial Energy Management Program* monitors and makes recommendations regarding energy consumption in provincially owned facilities.

Manager, Energy Conservation and Customer Services
NB Power
P.O. Box 2000,
Fredericton, NB, E3B 4X1
(506) 458-3008

Conservation and Electrical Improvement Loan Program offers interested residential, commercial and industrial clients loans up to \$1,500 for conservation improvements and \$2,000 for wiring improvement. *Energy Edge Publications* are case studies of energy-efficiency applications in the commercial sector, distributed free of charge.

NOVA SCOTIA

Manager, Energy Engineering
Department of Mines and Energy
P.O. Box 1087
Halifax, NS, B3J 2X1
(902) 424-8057

Industrial/Commercial Monitoring and Technology Transfer of Demo Projects monitors and evaluates energy demonstration projects to develop various information packages for industrial/commercial users. *Industrial/Commercial Energy Conservation Technological Studies* funds feasibility studies in both sectors. *Industrial/Commercial Demonstration Projects* shares the cost of exploring innovative and under-utilized conservation technology. There is an in-depth *Energy Analysis Program for Industrial and Commercial Facilities* whose annual energy bills exceed \$150,000. *Building Operator Training* provides courses and seminars to schools and provincial building operators. *Energy Awards* are available for outstanding industrial and commercial efficiency efforts.

Energy Education Officers
Department of Mines and Energy
P.O. Box 1087
Halifax, NS, B3J 2X1
(902) 424-8619

Energy Education Program sends instructors on request to schools, teaching energy concepts through film, skits, lectures and other media.

Program Administration Officer
Department of Mines and Energy
P.O. Box 1087
Halifax, NS, B3J 2X1
(902) 424-8619

Pro-Trucker Program explains fuel-saving and substitution techniques to line-haul and urban operators in the trucking industry.

Supervisor, School of Fisheries
Department of Fisheries
P.O. Box 700
Pictou, NS, B0K 1H0
(902) 485-6410

Pro-Fisher Program has incorporated training units on fuel saving and substitution into the curriculum of the Nova Scotia School of Fisheries.

Manager, Energy Utilization Department
Nova Scotia Power
P.O. Box 910
Halifax, NS, B3J 2W5
(902) 428-6455

Nova Scotia Power encourages conservation in the industrial, commercial and institutional sectors through on-site energy audits, promotion of load-management systems, load-monitoring and end-use studies, and workshops on electrotechnologies. *Energy Efficiency Awards* acknowledge energy-smart commercial designs and industrial/institutional applications.

PRINCE EDWARD ISLAND

Director, Energy and Minerals Branch
Department of Energy and Forestry
P.O. Box 2000
Charlottetown, PE, C1A 7N8
(902) 368-5025

Lighting Audit Assistance Program aids large electrical consumers in audits and retrofits. *EnerPool Vans Program* promotes the benefits of ride-sharing. *Energy Education Program* distributes materials to public schools. The department also maintains a database on energy policy.

Manager, Marketing/Customer Service
Maritime Electric Company
P.O. Box 2000
Charlottetown, PE, C1A 7N8
(902) 566-1599

Maritime Electric has submitted a proposal for a demand-side management program to the Public Utilities Commission Of P.E.I. The initiative includes a *Commercial High Efficiency Lighting Program* that will fund customer conversion to energy-smart devices, beginning with a free audit of existing lighting. Also proposed is the *Small Farm Energy Assistance Program* to explore alternative lighting measures for farming operations served under the residential rate. As of August 1991, the proposal has not been adopted.

NEWFOUNDLAND

Director, Energy Programs
Newfoundland Department of Mines and Energy
P.O. Box 8700
St. John's, NF, A1B 4J6
(709) 576-5757

Provincial Energy Management Program targets energy reduction in all public sector buildings, particularly hospitals, schools and recreation facilities. Other provincial initiatives include the all-sector *Alternative Energy Development Program* and *Transportation Energy Efficiency Program*.

Librarian, Department of Mines
and Energy
P.O. Box 8700
St. John's, NF, A1B 4J6
(709) 576-2416

Energy Resource Centre contains more than 4,000 volumes on energy-related subjects, including conservation, renewable resources, electricity and petroleum. The reference library is open to the public.

Facilities Consultant,
Community Recreation, Sports
and Fitness Division
Department of Municipal &
Provincial Affairs
P.O. Box 8700
St. John's, NF, A1B 4J6
(709) 576-3546

Arena and Swimming Pool Energy Retrofit Grants provide up to \$20,000 on a 60/40 basis to arenas and swimming-pool operators for energy conservation.

Director, Educational Finance
Department of Education
P.O. Box 8700
St. John's, NF, A1B 4J6
(709) 576-5755

School Energy Retrofit Grant provides a matching grant of \$1 per pupil per year to school boards that undertake energy-saving measures.

Manager, Economic Analysis
Newfoundland And Labrador Hydro
P.O. Box 9100
St. John's, NF, A1A 4K7

Newfoundland and Labrador Hydro has been developing a demand-side electricity-management program to make the system more efficient and defer new capacity requirements.

NORTHWEST TERRITORIES

Director, Energy Management Division
Northwest Territories Department of
Public Works
Box 1320
Yellowknife, NT, X1A 2L9
(403) 873-7203

Business Energy Audit Program offers on-site and computer-assisted energy audits to small businesses throughout the Territories, as does *Hamlet Energy Management Program* to hamlet councils. *Energy Conservation Capital Program* funds improvements to existing government buildings. The department undertakes public education, as well as an *Energy Education in Schools Program*.

YUKON

Energy Policy Analyst, Department
of Economic Development
Government of Yukon Territory
P.O. Box 2703
Whitehorse, YT, Y1A 2C6
(403) 667-5015

Saving Energy Action Loan (SEAL) Residential and Commercial Program, available to all Yukon home owners, businesses, and community organizations, provides an interest-free loan of up to \$3,000 for residences and up to \$10,000 for businesses to cover the cost of upgrading the thermal efficiency of a building. *Yukon Energy Alternatives Program* aids the development of appropriate, locally based, alternative-energy sources.



HAZARDOUS MATERIALS

QUICK START

What can you do, starting today, to avoid hazardous materials and/or ensure proper handling, storage and disposal of these materials in your workplace?

Quick start provides easy-to-implement actions providing excellent environmental benefits and potential cost savings:

QUICK START

FOR MORE INFORMATION

- | | |
|--|---|
| ■ Recover all used motor oil from your fleet for recycling | Look for QS [symbol] on page 36 |
| ■ Use latex paints (meeting the EcoLogo standards) and avoid alkyd paints which require solvents for cleanup | Look for QS on page 33 |
| ■ Use integrated pest management and organic practices on landscaping and grounds maintenance; avoid chemical herbicides, pesticides and fertilizers | Look for QS on pages 114, 115 in "Property Management" Chapter |
| ■ Use non-toxic, environment friendly cleaners; request that your cleaning contractor do so | Look for QS on page 36 |
| ■ When air conditioners are being serviced, insist that the technician recover the coolant/refrigerant, rather than vent it into the atmosphere | Look for QS on page 36. Also see "Energy" Chapter |

While you are developing a comprehensive environmental strategy and setting priorities for long-term goals, the Quick Start measures will help you get started. Implement as many of the target areas and actions found in this Chapter as possible.

**WE RECOGNIZE THAT THE CHEMICAL INDUSTRY HAS A RESPONSIBILITY TO TAKE
PROACTIVE STEPS TO PROTECT THE ENVIRONMENT, BECAUSE THE NATURE OF THE
MATERIALS AND PROCESSES WE USE MAY PRESENT A SIGNIFICANT POTENTIAL RISK
TO THE ENVIRONMENT.**

Du Pont Canada

HAZARDOUS MATERIALS IN YOUR WORKPLACE



YOUR HAZARDOUS MATERIALS ARE COSTING YOU AND THE ENVIRONMENT

In the enthusiastic surge of production since World War II, the number and use of chemicals have grown dramatically, not just of specialized compounds, used by large industries, but “everyday” chemicals in everyday products used by organizations like yours. Chemicals provide myriad benefits to modern society, but many of them also pose risks to the environment, and to human health and safety. Until recently, we had little idea just how much risk. Assuming the solution to pollution was dilution, we flushed or threw them away as if the environment would somehow dissipate them. What workplace hasn’t tossed batteries, oil, pesticides, old paint and solvents into the garbage or down the drain?

It turns out that many of these everyday materials and supplies are not as benign as we once thought. Indeed, many are now recognized as hazardous (see definition on page 41). When released in the environment, chemical contaminants can combine to create new ones. Far from dissipating, they persist in the air, water and soil, absorbed first by lower organisms, then accumulating up the food chain. Thus, the total bottom line from the use and improper handling of hazardous materials is the damage to the environment and our health — because what poisons the environment also poisons us.

To tighten the reins on hazardous materials, federal and provincial regulations are making it harder to introduce new ones, either as raw or finished products, and costlier to improperly handle them or simply dispose of them. For organizations that generate a lot of hazardous waste, that expense is significant, and rising.

Corporate liability in the form of punitive fines and site clean-ups can cost in the millions of dollars. An ounce of prevention would have been worth a pound of cure in cases like the Niagara River, into which 160 old or poorly constructed landfills leak an estimated 315 kilograms of contaminants per day. A similar amount of contaminants is still discharged from the industries and municipalities also situated by the river.

Disposal rates are soaring too: in Ontario, for example, they can range from \$100 to \$350 per tonne and higher, depending on the type and toxicity of waste. Smaller organizations, which are more likely dealing in drum quantities, are facing fees of \$25 to \$100 per drum, and higher for extremely toxic wastes.

In 1986, Canadians produced over 6 million tonnes of hazardous waste.

Hazardous materials must be managed in a conscientious way from “cradle to grave,” from their production to their ultimate disposal. Every organization must comply with, and it is hoped exceed, the existing regulations. However, legislation alone is not enough. Where there are no controls for certain materials and amounts, you must impose your own. First and foremost: eliminate the use of hazardous materials in your workplace wherever possible; next, reduce the toxicity and volume of those you must use, then reuse and recycle them; finally, properly handle, store and discard them, as required (see sidebar). The advice of waste-disposal specialists will be helpful.

And wiser management can also save you money. Disposing of waste solvent in Ontario, for example, can cost from \$300 to 700 per drum, whereas to recycle the solvents costs \$50 per drum. You can even make money by selling your hazardous waste through a waste exchange network (see sidebar). One organization's garbage is often another's raw material.

But the biggest savings to you and the environment will come when you substitute non-toxic materials for hazardous ones. Instead of living with the risk of financial liability, ill health and loss of precious life-supporting habitats, you eradicate it — once and for all.

Your workplace may use only small quantities of these hazardous substances, but taken together with all the amounts used by other organizations, they add up to a serious problem. No matter how large or small your amount, no matter how much or how little money you might save, you have a responsibility to help solve this problem — before it gets worse.

You can begin by formulating, then implementing a workplace hazardous materials action plan.

YOUR HAZARDOUS MATERIALS ACTION PLAN

Read through the Target Areas and Actions for eliminating, reducing, reusing and recycling hazardous materials. Then decide how many you can apply to your own workplace by conducting an assessment of hazardous materials throughout your operations. To give you an idea of the scope of the exercise, we've provided a Hazardous Materials Assessment Worksheet. However, because of the health and environmental risks involved and the need for compliance with existing regulations, this is one area you should not attempt to analyze yourself. Enlist the services of a competent environmental consulting firm, knowledgeable about hazardous materials and regulations, and seek government advice.

Once you know where and how the hazardous materials are being used, record the areas needing attention and actions to be taken in your Action Planner. The Action Planner provides a strategic plan tailored to your workplace. Some measures you'll want to implement right away, others will need further evaluation, but first create a

REGULATION

This chapter is not meant to supplant regulation and legislation covering hazardous materials. If you use materials that are defined as “hazardous” under and subject to regulation, you must ensure that you are in compliance. It is your responsibility to contact the appropriate government agency or authority.

You will find a brief summary of WHMIS, or Workplace Hazardous Materials Information System; and MSDS, or Material Safety Data Sheets. The definition of hazardous materials used in the Workplace Guide is broader than the definition under regulations (see sidebar). ◀

**Area: BUILDING
MAINTENANCE—PAINTS**

**Action: SWITCH TO LESS
HAZARDOUS PAINTS,
REUSE AND RECYCLE**

"Workplace Green Team" of participants representing each part of your organization (see Chapter, "How to Use the Workplace Guide and Get Started"). There are lots of ways to coordinate this, but do involve staff and delegate. Assign a captain to every applicable Target Area and Action, and set dates for Green Team progress reports.

For a definition of hazardous materials, please see page 41.

TARGET AREAS AND ACTIONS

There are two general types of paints: oil-based (alkyd) and water-based (including "latex" and casein-based). Oil-based paints contain organic solvents, metals, dyes and fungicides that make them flammable and poisonous; as well, they emit volatile organic compounds, (VOCs) a group of compounds generally agreed to contribute to ground-level ozone (a pollutant which causes eye, nose and throat irritation), ozone-layer depletion and global climate change. Clean-up generally requires solvents which are also hazardous.

Water-based paints are preferable because they reduce pollutants and do not require hazardous solvents for clean up, just soap and water. However, some water-based paints do contain solvents, which can release hydrocarbons into the atmosphere.

Environment Canada's Environmental Choice program (see "Purchasing" Chapter) has established a category of low-pollution, water-based paints that contain minimum amounts of mercury, formaldehyde, lead and other heavy metals, as well as lower levels of chlorinated solvents. A second category for reduced pollution, oil-based paint has also been established.

QS

Paints that meet the Environmental Choice EcoLogo standards are now on the market. So the next time your workplace needs painting:

- ☐ Use water-based paints instead of oil-based. Look for brands that meet the EcoLogo standards. (There are some applications for which water-based paints may not be appropriate: for example, the constant moisture in a washroom may require alkyd paint.)
- ☐ If you have to use oil-based (*alkyd*) paint, purchase those meeting the EcoLogo standards and reuse and recycle the paint thinners and solvents used to clean the paint brushes and rollers. If you contract the job to an outside company, specify in your contract that solvents must not be poured down drains. Solvents can be saved for reuse and the paint sludge that builds up on the bottom of storage containers should be disposed of eventually at a hazardous-waste depot.
- ☐ Instruct your purchasing agent or supplier to investigate less hazardous alternatives to varnishes and stains. These are suitable for both interior and exterior applications, and are formulated using citrus oils, pine and tree resins and natural pigments. A number of brands are on the market.
- ☐ Give away paint you can't use to your employees, for example, or local social service agencies. Be sure to include instructions on proper handling, cleaning, storage and disposal.
- ☐ When your workplace furniture needs refinishing, choose a repair service that avoids paint strippers with methylene chloride. Methylene chloride can cause eye and skin irritation and serious health problems. Avoid prolonged exposure.
- ☐ If you or your maintenance department does the painting or refinishing rather than contracting the job out, be sure to store paints, thinners and any solvents away from your furnace, heating ducts or drains. They must be securely contained and properly labelled.

**Area: BUILDING MAINTENANCE
— OTHER MATERIALS**

**Action: SWITCH TO LESS
HAZARDOUS ALTERNATIVES,
REUSE, AND RECYCLE**

There are many other hazardous materials that are used in maintaining your building, whether your employees or an outside company you've hired apply them. Check the list on your Hazardous Materials Assessment Worksheet. Wherever possible, practise the principle of elimination and substitution — switch to less hazardous alternatives.

- ☐ Use water-based or natural glues, eliminating the need for the hazardous cleaners and solvents used in cleaning solvent glues.
- ☐ Avoid paint strippers that contain methylene chloride. Substitute for less-toxic, water-based strippers. Sand to strip furniture or wood, instead of using paint strippers. (Sanders should wear masks.)
- ☐ Avoid wood preservatives containing pentachlorophenol, arsenic and creosote. Instead, use a water repellent or sealant. Or choose rot-resistant woods from trees which are not endangered.
- ☐ If you do your own window cleaning, mix water with a little natural vinegar — it does the best job. Or specify to your contractors to use a non-toxic solution.
- ☐ Substitute de-icers that are not salt-based for clearing walkways and sidewalks in winter. Salt damages trees, shrubs and grass, pollutes groundwater and streams, and corrodes the metal of vehicles, just to name a few of its unfriendly effects. (See "Purchasing" Chapter, for more information on alternatives.)
- ☐ Ensure that you are following good practice for all the materials you use, as outlined in "Proper Use, Storage and Disposal of Hazardous Materials."
- ☐ Investigate waste exchanges in your area for reuse and recycling of suitable, hazardous materials and solvents that you no longer use.
- ☐ Review your disposal practises for the waste products you generate. Make sure they don't end up in the sewer system or landfill. Arrange for the collection of these materials by a licensed company providing the proper collection and treatment of these materials.

**Area: GROUNDS
MAINTENANCE — PESTICIDES,
HERBICIDES AND FERTILIZERS**

**Action: ELIMINATE, REDUCE,
SWITCH TO LESS HAZARDOUS
ALTERNATIVES**

If you're planning to build on a new site, or your existing grounds need improvement, consider planting alternatives to grass, such as low shrubs, spreading ground covers and wildflowers, all of which can eliminate or reduce the need for pesticides, herbicides and fertilizers.

Probably your existing grounds are cared for by contractors or building management. Use your contract to specify the types of products to be used and practices to be followed. Often, the pesticides, herbicides and fertilizers used to keep the lawn green and weed-free are overapplied and may not even be necessary. As much as

CANADIAN CHEMICAL PRODUCERS ASSOCIATION

CCPA represents 73 chemical producers across Canada, who have adopted Responsible Care as their business philosophy. Through this program, responsible development, manufacture, transportation, storage, handling, distribution, use and ultimate disposal of chemicals and chemical products is encouraged. ◀

Approximately 425 million litres of used motor oil are discarded in Canada every year, yet only 25% of this oil is re-refined and reused which means 9 times the oil spilled by the Exxon Valdez is wasted each year.

**Area: TRANSPORTATION
MAINTENANCE**

**Action: SWITCH TO LESS
HAZARDOUS PRODUCTS
AND PRACTICES**

50 percent of the chemicals that go on lawns, gardens and crops can end up in groundwater or surface water⁴. Plants growing in healthy soil are better able to fight off pests and disease.

To eliminate or reduce your use of these hazardous materials by keeping your soil healthy:

- ☐ Mow the grass no shorter than 7.5 centimetres.
- ☐ Leave grass clippings on the lawn. A mulching lawn mower chops the grass clippings into fine pieces.
- ☐ Start a compost for pruned material and excess clippings.
- ☐ Top dress your lawn with compost.
- ☐ Hand-weed. If you don't contract the job out, offer your employees' children a reward of five cents per dandelion and other undesirables.
- ☐ De-thatch each fall; mechanically aerate in the spring.
- ☐ Lawn watering shouldn't be necessary. Grass naturally goes dormant and brown-coloured during dry periods and it is particularly important to conserve water at these times. The grass will recover. Trickle irrigation of trees and shrubs and handwatering annual flower beds when necessary is a better use of water. (See "Water" Chapter)

If you feel it is necessary to use a pesticide, herbicide or fertilizer:

- ☐ Choose alternative products such as diatomaceous earth and insecticides made from fatty acids and soaps. These are commercially available, often labelled as "organic." However, that doesn't mean they are harmless to humans. Follow instructions carefully and wear gloves (and mask) as an extra precaution. Again, use only what you need. There are many other do-it-yourself remedies, such as insect traps and insect repellent sprays. (See "Sources" and "Property Management" Chapter.)
- ☐ Use organic fertilizers, such as compost and aged manures and mulches.
- ☐ Buy only what you need, especially if you use hazardous materials and apply only the recommended amount.

If you operate a fleet or provide employees with cars, then you have several opportunities to eliminate or reduce the use of hazardous materials and the waste vehicles create. Start by finding ways for your employees to drive less and reduce air emissions, as well as the need to change oil or tires as often. Encourage them to do more business by phone or fax, and to more efficiently plan delivery routes, for examples see "Transportation" Chapter.

If driving is a necessary part of your workplace activities, then reduce your use of hazardous materials and waste generated by them by switching to non-hazardous alternatives. See Proper Use, Storage and Disposal of Hazardous Materials.

For detailed advice on reducing your use of fossil-fuel transportation, and the corresponding hazardous materials for its maintenance, see "Transportation" Chapter.

- ☐ Use re-refined motor oil in your fleet to reduce the consumption of crude-oil resources.
- ☐ Refuse the option of air conditioning when purchasing new vehicles. The refrigerant, is a known serious cause of atmospheric-ozone depletion.

- QS** ☐ If your fleet has air conditioning, take care when servicing to prevent the release of refrigerant to the outside air. Car dealers have installed recycling machines at their service centres that recover chemicals for re-use. (See "Transportation" Chapter.)
- ☐ Ensure that you are following good practice for all your transportation-related hazardous materials and waste, as outlined in "Proper Use, Storage and Disposal of Hazardous Materials."
- ☐ Ensure all hazardous materials are stored in proper containers.
- ☐ Review your disposal practices for the transportation-related hazardous waste you generate (See "Transportation" Chapter). Make sure they don't end up in the sewer system or landfill. Arrange for the collection of these materials by a licensed company providing the proper collection and treatment of these materials.
- QS** ☐ Collect used motor oil to be taken to a waste oil depot, or if your volumes warrant, to be picked up by a waste-oil collection firm. This "waste" oil can be re-refined for use again as motor oil. Used motor oil is a hazardous waste containing heavy metals — it should never go down the drain or be poured on the ground. (See "Transportation" Chapter.)
- ☐ Save car and truck batteries for collection by a recycling company. Batteries usually contain heavy metals like lead, mercury and silver, (and an acid,) and should not be sent to landfill. (See "Transportation" Chapter.)

**Area: INTERIOR — OFFICE
CLEANING PRODUCTS AND
PROCEDURES**

**Action: SWITCH TO LESS
HAZARDOUS ALTERNATIVES,
REDUCE AND PROPERLY
MANAGE**

Cleaning of offices is often contracted out to commercial cleaning companies. Review your existing contract and specify the type of products and procedures to be used in your workplace.

Many cleaning materials on the market — such as drain, floor and other surface cleaners — contain hazardous substances — sometimes because of sanitation standards. But when cleaners dump their dirty "water," it goes into the sewer system, and eventually water supplies. The less you use, the less the impact on groundwater, rivers and lakes.

- ☐ Instruct your contractors or cleaning staff to reduce the use of hazardous cleaning materials (see definition of hazardous materials) by substituting the following products and procedures to enhance worker safety and minimize water contamination:
- Prevent cleaning problems which usually necessitate the use of hazardous materials. For example, keep grease out of drains and install food and hair traps. Instruct cleaning staff to clean all areas regularly rather than waiting for a build-up of grease and dirt. If necessary to unblock drains ask your supplier about bacterial and other non-hazardous products.
 - Use the least hazardous product for each cleaning chore keeping in mind sanitation requirements especially in food-preparation and washroom areas (ask for advice from your local health unit). For example, cleaning windows and mirrors can easily be done with a vinegar and water solution. A damp cloth can replace aerosol dusting compounds on even the finest wood furniture. (See "Sources" for more information).
- QS**

One litre of oil can contaminate 2 million litres of water.

- Check the manufacturer's claims for such terms as non-toxic and biodegradable before making purchasing decisions. Ask to see independent test results and material safety data sheets (MSDS) on their products.
- Specify low-phosphate, non-hazardous cleaners (See sidebar below).
- Use the least amount of cleaning material to achieve the necessary result and make sure that new employees are instructed in the proper use of materials. Follow WHMIS labelling instructions.
- Specify controlled dosing rather than manual or single-use packages; automatic dosing ensures that the minimum amount of product is used and reduces packaging waste as well particularly where large refillable containers are available.
- If refillable containers are not available, specify packaging that can be recycled in your community or ask the product supplier to take the containers back.
- Specify concentrated cleaning materials where possible as the container will last longer (and can possibly be refilled). However, be certain staff know how to dilute the material to minimize waste of both cleaning material and water.
- Follow good practice for all cleaning products, as outlined in "Proper Use, Storage and Disposal of Hazardous Materials."
- See "Property Management" Chapter for more information.

Area: INTERIOR — BUILDING MATERIALS AND FURNISHINGS

Action: SWITCH TO LESS HAZARDOUS ALTERNATIVES, REDUCE AND PROPERLY MANAGE

If your organization is planning a move to a new building, or renovating an existing one, you have an opportunity to upgrade it environmentally by choosing less hazardous materials in its construction and furnishing. Even if you're not in the market for a major overhaul, there are simple steps you can take to reduce the impact of hazardous substances emitted by workplace materials and furnishings. Since you may likely contract the services of outside companies to provide much of the labour and materials, specify the following measures, where applicable, in your agreement:

- Whether building, renovating or replacing materials and furnishings, determine the hazardous substances in their contents (compile the list in your Hazardous Materials Assessment Worksheet).
- Instruct builders to seal plywoods and particle boards used indoors. Most regular particle boards are made with resin glues and are a major source of indoor formaldehyde. Low emission particle board is available although not widely; ask anyway.

PHOSPHATES AND NTA

Phosphates, the "builders" in cleaning products, are not normally thought of as "hazardous." But phosphates do have the potential to cause environmental damage by promoting algae growth in water ways. Too much algae reduces oxygen levels in the water, killing fish and other aquatic life. In response to the need to limit the amount of

phosphates entering lakes and rivers, the federal government regulated the amount of phosphates in laundry detergents in 1970. Many products still contain high levels of phosphates. Chemicals added during sewage treatment help remove phosphates. But only 69.9% of the Canadian population, living in communities of over 1,000 people, have any kind

CONT'D

- ☐ Make sure that the insulation you are installing has not been made with CFCs, chemicals known to deplete the ozone layer. Regulations are phasing out the use of CFCs in insulation. However, choose alternatives carefully, for example, polystyrene contains some formaldehyde.
- ☐ Use water-based paints; look for brands that meet EcoLogo standards. (See "Purchasing" Chapter.)
- ☐ Use water-based or natural glues, eliminating the need for hazardous cleaners and solvents used in cleaning solvent glues.
- ☐ Sand to strip furniture or wood, instead of using paint strippers. Sanders should wear masks. Avoid paint strippers that contain methylene chloride. Substitute for less toxic, water-based strippers.
- ☐ When choosing carpeting, try to find alternatives to latex-bonded carpets, which emit volatile organic compounds — particularly the agent 4 PC, which gives that typical "new carpet odour" for months. The better, albeit more expensive, option is to select handmade rugs, fully woven carpets or fusion-bonded carpets.
- ☐ Choose extinguishers which do not contain halons and ensure the safe storage and decommissioning of halon systems.
- ☐ Exercise caution when testing, repairing or replacing fire extinguishers and systems. These often contain halon, a particularly destructive CFC, that should not be vented to the outside air. Ask vendor to take back or buy back halon-filled extinguishers. In some applications systems containing halon can be replaced with water sprinklers. Guidelines have been developed for decommissioning of halon systems. Please contact Manager, Environmental Projects, Northern Telecom, 3 Robert Speck Parkway, Dept. 0100, Mississauga, Ontario L4Z 3C8.
- ☐ Add real greenery, not artificial, to your workplace. It can help reduce the concentrations of at least three common indoor air pollutants: formaldehyde, benzene and trichloroethylene. Spider plants, philodendrons, ivy, and potted mums were all tested and found to be effective.
- ☐ Ensure that you are following good practice for all hazardous materials as outlined in "Proper Use, Storage and Disposal of Hazardous Materials."
- ☐ Maintain or upgrade to proper building ventilation to avoid "Sick Building Syndrome" (See sidebar in "Energy" Chapter). The long-term answer is not to rev up all exhaust fans (without heat recovery) — or leave windows open (if they open). These may provide fresher air, but you're losing valuable heated or cooled air, which wastes energy. You'll find information on improving your ventilation system in the "Energy" Chapter.

of sewage treatment. Of these, only 40% have tertiary treatment, which is the most effective treatment method that removes phosphorus in the effluent.⁵ The choice of NTA as a phosphate substitute has been a controversial one because of its detection in rivers and lakes, even after sewage treatment. What's the answer for choosing cleaning

products? Choose cleaning products that are: low-phosphate, made with citrus or plant-based builders, and non-hazardous. And, of course, use the minimum amount of any kind of cleaning product. ◀

NTA - Nitrilo triacetic acid - a chelating agent

**Area: INTERIOR — OFFICE
EQUIPMENT AND SUPPLIES**

**Action: ELIMINATE,
SWITCH TO LESS
HAZARDOUS ALTERNATIVES,
AND PROPERLY MANAGE**

Many of the supplies and equipment that we take for granted in our workplace can be significant polluters of our indoor — and outdoor — environment. For example, photocopiers, computer printers and air cleaners may contain and emit hazardous materials, such as ozone, a colourless gas that, at ground level, can irritate the eyes, nose and throat. On the other hand, air conditioners can leak their refrigerants, which destroy “good” ozone, the ozone layer around our planet.

Where possible, substitute less hazardous alternatives for supplies and equipment containing hazardous materials. Where you can’t avoid the product, buy and use only what you need (and follow the guidelines in “Purchasing” Chapter). Along with proper handling of existing supplies and equipment, thorough ventilation is crucial for a safe and healthy workplace. See “Energy” Chapter, for details on “Sick Building Syndrome,” which results from inadequate ventilation, and ways to improve your existing system.

- ☐ Eliminate and reduce the use of equipment and supplies with hazardous content, as outlined in the list in your Hazardous Materials Assessment Worksheet.
- ☐ Use equipment only when needed. For example, instead of photocopying multiple copies, circulate one copy or use electronic voice mail.
- ☐ Use emulsion latex-type glues, such as latex contact cement, which are safer to handle. Many glues contain hazardous solvents, such as xylene, toluene, or acetone.
- ☐ Choose paper-correction tape rather than liquid types.
- ☐ Use alternatives to foam packaging, which can be manufactured using CFCs. Shredded newsprint is a good substitute, and popcorn is also being used.
- ☐ Practise recovery and recycling of film-processing solutions, which contain hazardous chemicals, in particular silver and bleach solutions. The silver can be recovered in your or other photo labs, then sent out for re-refining. Bleach solutions can be recycled. See “Sources” for a directory of specialty recyclers.
- ☐ If you run or patronize a photo shop or company using solvents or liquid chemicals, there are specialized companies that will come in and filter your chemicals so they can be reused, rather than thrown away after loading up with contaminants.
- ☐ Refill toner cartridges used in photocopiers and laser printers. (See “Purchasing” Chapter). Programs also exist to recycle cartridges. Ask your dealer or manufacturer.
- ☐ Use alternatives to air conditioning such as opening windows (if you’re that lucky), overhead fans, reflective film and roller blinds.
- ☐ When operating air conditioning, use moderate temperature settings and ensure the timing cycle matches the workday schedule.
- ☐ When servicing air conditioners or office refrigerators, make sure the contractor recovers the refrigerant which depletes the ozone layer. It must not be vented to the outside air.
- ☐ Instruct employees in the wise use of video display terminals (VDTs). There is controversy over the risk to operators from electromagnetic fields given off by VDTs. And eye and back strain is associated with long periods of operation. Regular emission checks, scheduled breaks, proper lighting and ergonomically positioned key boards, screens and chairs are essential.

One drop of oil can render up to 25 litres of water unfit for drinking.

- ❑ Provide good ventilation everywhere, but especially in areas where photocopiers, computer printers and electronic air cleaners are used because they may give off ozone.

Depending on the type of photocopier, they may emit low levels of heavy metals and toner dust. Filters designed to capture these materials need to be changed regularly. Refer to the owner's manual or your service representative. And ensure that photocopy machines are kept away from workstations, preferably in a separate, well-ventilated room.

- ❑ Ensure that you follow good practice for all the equipment and supplies containing hazardous materials, as outlined in "Proper Use, Storage and Disposal of Hazardous Materials."

By following these guidelines, as well as the guidelines on "Proper Use, Storage and Disposal of Hazardous Materials," and using the Worksheets, you'll be well on your way to a successful workplace hazardous materials action plan.

PROPER USE, STORAGE AND DISPOSAL OF HAZARDOUS MATERIALS

These are general guidelines for the use, storage and disposal of hazardous materials in the workplace to prevent environmental damage. *It is your responsibility to ensure that all applicable laws and regulations are met. See "Sources" for additional information.*

LABELLING

A label should include the ingredients of the product, and list instructions on proper use. Only products covered under WHMIS (Workplace Hazardous Materials Information Service) legislation will bear WHMIS labels (see sidebar, this chapter). However, look for *any* information regarding hazards. Remember, this does not necessarily indicate environmental risk. When in doubt about a product, contact the manufacturer or supplier and ask for a material safety data sheet (MSDS).

USE

- Buy only what you need.
- Ensure that you and your employees have participated in a "mock" spill or explosion and know the emergency procedures.
- Use in well-ventilated locations; provide separate and thorough ventilation to all areas where these materials are used.
- Wear protective clothing, including gloves, masks, respirators and goggles.
- Use only in designated areas, segregated from lunch rooms and other work areas.

WORKPLACE HAZARDOUS MATERIALS

INFORMATION SYSTEM (WHMIS)*

WHMIS is a Canada-wide system designed to give employers and workers information about hazardous materials in the workplace. Under WHMIS, there are three ways in which information on hazardous materials is to be provided:

1. labels on the containers of hazardous materials;
2. material safety data sheets (MSDS) to supplement the label with detailed hazard and precautionary information; and
3. worker education programs.

The supplier of the hazardous material provides the labels and material safety data sheets to the employer. The

- Ensure safety equipment is used and precautions are followed at all times.
- Observe all safety requirements.

STORAGE

- Always store hazardous materials in the proper containers and keep tightly capped.
- Keep all materials labelled with complete first-aid information.
- Post the telephone numbers of the spill-control agency on the outside of the storage cabinet and the 24-hour telephone number of the person responsible for the cabinet.
- Do not store near food or medicines.
- Storage areas/cabinets should be cool, dry, vented and locked.
- Store basic chemicals away from acidic ones.
- Do not use chemical containers for other purposes.
- Register the chemical storage area and contents with your building manager, fire official and police station.

DISPOSAL

- Use a waste exchange for solvents and materials you can no longer use.
- Never dispose of hazardous materials by flushing them down the drain, pouring them on the ground, or putting them out with the regular garbage.
- Contract the services of a licensed hazardous-waste company.
- Remember, the containers used to store hazardous materials should be treated themselves as hazardous.

WHAT ARE HAZARDOUS MATERIALS?

There may be as many definitions of hazardous materials as there are hazardous materials.

In the Workplace Guide, hazardous materials are defined as solid or liquid materials that may cause or significantly contribute to illness or death or that cause a substantial threat to human health or the environment when the waste is improperly managed.

The familiar symbols found on containers of consumer products, such as the skull-and-crossbones were originally designed to indicate a risk to human health and safety, not a risk to the environment.

employer passes the information on to the worker and provides education programs.

WHMIS is implemented by a combination of federal and provincial legislation.

Workplace hazardous substances are classified under the Workplace Hazardous Materials Information System (WHMIS) as:

- Class A1 Compressed Gas*
- Class B1 Flammable and Combustible Material*
- Class C1 Oxidizing Material*
- Class D1 Materials Causing Immediate Toxic Effects*
- Class D2 Materials Causing Other Toxic Effects*
- Class D3 Biohazardous Infectious Materials*

CONT'D

Domestic products considered "hazardous" are those designated and labelled as:

- corrosive (such as acids)
- flammable (burns easily)
- reactive (explosive, or produces deadly vapours)
- toxic (poisonous to human health)

Many products which are not defined as hazardous under regulations should be disposed of as hazardous wastes. The regulatory definition of hazardous materials, in the opinion of many people, does not go far enough.

CANADIAN WASTE MATERIALS EXCHANGE

In most provinces, there is a waste exchange network or a provincial waste exchange, where companies looking for a particular chemical or material are matched up with companies that produce the chemical or material as a waste. Acting as an umbrella organization over all of them, facilitating the transfer of information on available wastes, is the Canadian Waste Materials Exchange (CWME) (see "Sources" for address). Since its launch in 1978, it has had more than 3,500 companies participating in the program and 2,300 inquiries. Because of the often specific natures of waste waiting for exchange, the long transportation distances and the need for secure supply, only 18 percent of the wastes listed with CWME have been actually transferred.³ This still represents more than 307,000 tonnes of waste transferred — and kept out of landfill.

SUCCESS STORIES

CLEAN SHIRTS, CLEANER ENVIRONMENT The solvents used in dry cleaning sometimes can be hazardous to the environment if they find their way into groundwater. Of particular concern is the solvent, perchlorethylene, or 'perc', a potentially serious health hazard.

Perth Services, a dry cleaning company in Winnipeg recently installed equipment that recovers for reuse almost all of its 'perc', and does so cost-effectively.⁴

RED INK, BLACK INK RBW Graphics of Owen Sound¹⁰ was sending three million kilograms of waste to landfill each year, including inks. In 1988, the plant engineering division put RBW on a diet.

Class E Corrosive Material

Class F Dangerously Reactive Materials

Only certain products in each class are covered under WHMIS, which is indicated by a WHMIS label reflecting its classification. ◀

Equipment was installed that would recover and clean 98 percent of these spent printing inks — what used to be waste is now 'new' ink, ready for reuse. As a result, over 35,000 kg of ink, that normally went to landfill, was recovered and diverted in 1989. RBW Graphics did a good turn for the environment while, at the same time, saving money in purchases of new ink and in landfill costs.

A CLEANER PICTURE Those cute pictures of the kids and family dog at the beach can carry a hefty environmental price tag: many photo labs dilute the chemicals used in developing photographs and pour them down the drain. Among the chemicals released in this way are a variety of phosphates, nitrates, silver and ferrocyanide.

Not Winnipeg Photo. This environment-smart and innovative company, installed equipment to recover silver, bleach, fixer and developing fluid for recycling. An added bonus was that Winnipeg Photo quickly recouped its investment in recovery equipment through the sale of the silver and chemicals it recovered.

CLEANING ANTI-FREEZE The rapid increase in the cost of antifreeze has made recycling an attractive option for fleet owners and garage operators.

Glyclean is a patented system which takes used anti-freeze and oxidizes it to remove suspended solids. The distributors of Glyclean state that not only does their process recycle antifreeze (keeping it out of municipal drains) but it also improves the product by inhibiting deposit build up in radiators.¹¹

CFC-FREE CIRCUIT CLEANING Northern Telecom is now using a new circuit board soldering process and expects to soon eliminate its use of chlorofluorocarbons (CFCs). The electronic industry uses CFCs to clean soldering residues from circuit boards. CFCs are a chief cause of ozone depletion. Northern Telecom's new wave soldering machine encloses the board in an inert gas and soldering is controlled by computer — no residues, nothing to clean up.¹²

ZERO-DISCHARGE Millar Western Industries of Alberta will construct what will be the first zero-liquid effluent pulp mill at Meadow Lake, Saskatchewan. All mill waste will be treated on-site in a closed loop system.¹³

BATTERY RECYCLING Battronics and Canadian Tire have begun a recycling program for automotive and marine batteries.

Canadian Tire is setting up collection depots in Metro Toronto and Battronics collects the discards to recover battery components and materials.¹⁴

FOOTNOTES

¹ Former V.P. Corporate Affairs, Du Pont Canada Inc., in a speech to the Business and our Environment: Responsible Partnerships Conference, the University of Western Ontario, February 28, 1991.

² Great Lakes, Great Legacy. Conservation Foundation and International Centre for Research and Public policy, 1991.

³ "Industrial Waste Reduction Seminar," M.J. Hanley, B. Laughlin and L. Varangu. Ontario Waste Exchange. November 1991.

⁴ *Water: No Time to Waste*. Minister of Supply and Services, 1990

⁵ "Industrial Waste Reduction Seminar," M.J. Hanley, B. Laughlin and L. Varangu. Ontario Waste Exchange. November 1991.

⁶ *Workplace Hazardous Materials Information System (WHMIS): A Guide to Legislation*. Ontario Ministry of Labour. May 1989.

⁷ "A Statement Policy on Responsible Care." Canadian Chemical Producers' Association. Ottawa, 1985.

⁸ *Municipal Water Use In Canada 1989*. Social Studies Series, Environment Canada. D.M. Tate and D. La Celle.

⁹ *The Canadian Green Consumer Guide*. McClland & Stewart Inc., 1989, page 57.

¹⁰ *Profit from Pollution Prevention*. Pollution Probe Foundation, 1990, page 35.

¹¹ *Waste Reduction Bulletin*, Ontario Waste Management Corporation. September 1990

¹² *ECO-LOG Week*, Corpus Information Services, Toronto, April 13, 1991.

¹³ *ECO-LOG Week*, Corpus Information Services, Toronto.

¹⁴ *ECO-LOG Week*, Corpus Information Services, Toronto, Nov. 9, 1990.

SOURCES AND REFERENCES

The availability of information in both French and English varies depending on its source and purpose. References and publications are presented in the language in which they were provided.

NATIONAL

The Canadian Centre for Occupational Health & Safety (CCOHS)
250 Main St. E.
Hamilton, ON, L8N-1H6
(416) 572-4400 (English);
toll free in Canada 1-800-263-8466
(English)

CCOHS is a public corporation formed in 1978 to provide authoritative information on occupational health and safety through a national system of computerized information, an inquiries service and publications. CCOHS information includes: CHEMINFO database for WHMIS information (see below); TRADE NAMES (MSDS) database; and such publications as *At the Centre*, CCHOS's newsletter, three issues, free on request, and *Hazards of Photocopiers*, which describes kinds and effects of chemicals used in photocopying.

WHMIS Information
Product Safety Branch
Consumer & Corporate Affairs Canada
Ottawa, ON, K1A 0C9
(613) 997-1194

WHMIS (Workplace Hazardous Materials Information System) is a nation-wide information standard designed to protect Canadian workers from hazardous materials in the workplace.

Canadian Waste Materials
Exchange (CWME)
ORTECH International
2395 Speakman Dr.
Mississauga, ON, L5K 1B3
(416) 822-4111

CWME publishes a national waste-exchange bulletin, *Canadian Waste Materials Exchange*, six times a year. Subscription fee: \$60 per year. Listings free of charge.

FEDERAL
Environment Canada
Inquiries Centre
Ottawa, ON, K1A 0H3
(819) 997-2800

BRITISH COLUMBIA
B.C. Hazardous Waste Management
Corporation
Suite 500, 3795 Carey Rd.
Victoria, BC, V8Z 6T8
(604) 384-5342

Underway since August 1990, this crown corporation has begun hazardous-waste collection for households and small commercial-waste generators through permanent depots, mobile depots and a "hazmobile" travelling to small communities. Check with the office about programs that serve your needs.

B.C. Waste Exchange
102- 1525 West 8th Ave.
Vancouver, BC, V6J 1Y5
(604) 731-7222

B.C. Waste Exchange is operated by Recycling Council of British Columbia. There is no membership fee to use the exchange or to receive its quarterly newsletter, which lists waste wanted and waste available.

ALBERTA
Alberta Special Waste Management
Corporation
Pacific Plaza
10909 Jasper Ave., 9th Floor
Edmonton, AB, T5J 3L9
(403) 422-9600

This crown corporation operates, in conjunction with Chem-Security Ltd., a provincial network of collection centres and transfer stations for hazardous waste.

Alberta Waste Materials Exchange
(AWME)
Alberta Research Council
P.O. Box 8330, Postal Station F
Edmonton, AB, T6H 5X2
(403) 450-5408

AWME provides a free quarterly bulletin that lists waste wanted, waste available, and services available.

SASKATCHEWAN
Air and Land Protection Branch
Department of the Environment and
Public Safety
Walter Scott Building
3085 Albert St.
Regina, SK, S4S 0B1
General Information: (306) 787-6113
Industrial and Hazardous Waste Unit:
(306) 787-6412

This unit provides information and answers specific questions on hazardous waste.

Chemical Safety Unit: (306) 787-6193

This unit runs the Agricultural Chemical Collection Program for farmers to dispose of any unused chemicals.

The processing, storage, transportation, disposal, reuse and recycling of hazardous wastes are regulated under the Environmental Management and Protection Act.

MANITOBA

Department of the Environment
Building 2, 139 Tuxedo Ave.

Winnipeg, MB, R3N 0H6

General Information: (204) 945-7100

Dangerous Goods Handling and
Transportation: (204) 945-7094

Regulation 140 of the Dangerous Goods Handling and Transportation Act covers the registration of hazardous-waste generators. Exemptions are possible if the waste is to be recycled.

Manitoba Hazardous Waste Management Corporation (MHWMC)

226 - 530 Century St.

Winnipeg, MB, R3H 0Y4

(204) 945-1844 or 1-800-782-2474

This crown corporation runs a generator services program, providing technical advice, referral to waste-management services, and waste-exchange information. It also publishes a Generator Services Index.

Manitoba Waste Exchange (MWE)

1329 Niakwa Rd. E.

Winnipeg, MB, R2J 3T4

(204) 257-3891

MWE is run by the Biomass Energy Institute and funded by Manitoba Hazardous Waste Management Corporation and Manitoba Environment. It provides waste reduction, recycling and disposal information, as well as a bulletin, published three times a year, listing waste for sale.

ONTARIO

Ontario Waste Management Corporation (OWMC)

2 Bloor St. W., 11th Floor

Toronto, ON, M4W 3E2

(416) 923-2918 or 1-800-268-1178

This crown corporation offers three categories of programs for the commercial and industrial sectors: waste reduction, technical services, and laboratory services, all of which are listed in OWMC's *Marketing Services*. It conducts an *Opportunities Waste Reduction Workshop* at request around the province, and sells two videos: *The Competitive Edge*, which explains the six steps of an audit (18 minutes); and *Money Down The Drain*, which applies the 4Rs to liquid industrial hazardous waste in Ontario plants. VHS or Beta. \$24.00 each. Also available from OWMC, *Enviro-Dial*, a handy display pin-up that shows alternatives to using hazardous products in the home. \$2 each (volume discounts available).

Ontario Waste Exchange (OWE)

ORTECH International

2395 Speakman Dr.

Mississauga, ON, L5K 1B3

(416) 822-4111

OWE is operated by ORTECH (formerly Ontario Research Foundation) and funded by Ontario Waste Management Corporation and Ontario Ministry of Environment. It offers industry many free services, including technical assistance, recycling information and waste-for-exchange listings in *Canadian Waste Materials Exchange*.

QUÉBEC

**Division des déchets dangereux
Ministère de l'Environnement**

3900, rue Marly

Ste-Foy, PQ, G1X 4E4

(418) 644-3402

The Environment Quality Act regulates both the handling and transportation of hazardous waste in the province. Quebec Ministry of Environment does not operate any funding programs for hazardous-waste handling. No waste-management corporation or similar organization exists to date.

NEW BRUNSWICK

Hazardous Waste Officer,
Operations Branch

Department of the Environment

364 Argyle St., P.O. Box 6000

Fredericton, NB, E3B 5H1

(506) 457-4848

General Information: (506) 453-3827

New Brunswick is currently examining new regulations under the Clean Environment Act to cover hazardous-waste management and disposal.

NOVA SCOTIA

Manager, Hazardous Waste
Management Section

Department of the Environment

5151 Terminal Rd., 5th floor

P.O. Box 2107

Halifax, NS, B3J 3B7

(902) 424-5300

The department regulates hazardous waste by permit system. Waste oil, petroleum storage tanks, and PCB storage all fall under the Dangerous Goods and Hazardous Wastes Management Act. A hazardous-waste transfer station is being planned.

PRINCE EDWARD ISLAND

Department of the Environment
Jones Building, 4th Floor
11 Kent St., P.O. Box 2000
Charlottetown, PE, C1A 7N8
General Information: (902) 368-5000

There is no legislation in P.E.I. devoted exclusively to hazardous-waste use and disposal, but the Environmental Protection Act regulates pollution and contaminants.

NEWFOUNDLAND

Department of the Environment
and Land
Confederation Building
West Block, P.O. Box 8700
St. John's, NF, A1B 4J6
(709) 576-5783
General information: (709) 576-3394

The Newfoundland Department of Environment and Land administers the Waste Materials (Disposal) Act, which requires approval in advance for the storage, transportation and disposal of special wastes. These include most chemicals and hazardous materials, once they have been declared obsolete or have otherwise become no longer suitable for their intended purpose.

NORTHWEST TERRITORIES

Pollution Control Division
Department of Renewable Resources
P.O. Box 1320
Yellowknife, NT, X1A 2L9
(403) 873-7654

This division administers pollution legislation in the territory.

YUKON TERRITORY

Conservation and Protection Division,
Environment Canada
P.O. Box 6010, 100 Hamilton Blvd.
Whitehorse, YT, Y1A 5L7
(403) 667-3400

This division administers regulations governing the proper management of hazardous waste in the territory.



WASTE

QUICK START

What can you do, starting today, to reduce, reuse and recycle wastes in your workplace?

Quick Start provides easy-to-implement actions providing excellent environmental benefits and potential cost savings:

QUICK START

FOR MORE INFORMATION

- | | |
|--|--|
| ■ Implement an aggressive program to reduce and reuse fine paper, and other office paper. | Look for QS [symbol] on page 51 |
| ■ Set up a fine paper recycling program. | Look for QS on page 51 |
| ■ Launch a low, or no-waste program in lunch rooms and food service areas, including can and bottle recycling, avoiding disposable dishes, utensils and other food service items, and practising alternatives to putting food scraps in the garbage. | Look for QS on page 56
Also see "Property Management" Chapter. |
| ■ Set up a cardboard recycling program. | Look for QS on page 51 |

While you are developing a comprehensive environmental strategy and setting priorities for long-term goals, the Quick Start measures will help you get started. Implement as many of the target areas and actions found in this Chapter as possible.

Lester Brown
World Watch Institute



WASTE IN YOUR WORKPLACE



YOUR WASTE IS COSTING YOU AND THE ENVIRONMENT

In nature, there is no such thing as waste. But we Canadians manage to generate almost 30 million tonnes of garbage every year. That means each of us is responsible for a hefty 1.7 kilograms a day.¹ Roughly half of that waste comes from the residential sector and the other half from yours — the commercial, institutional and industrial sectors. Canadian offices alone send to landfill nearly 6.6 million tonnes of recyclable wastes a year, including over 200 million sheets of paper.²

Until recently, it was cheap and easy to throw out the waste created in your workplace. Now, it is becoming a significant cost on the balance sheet. Landfill and incinerator tipping fees have jumped from \$15 to \$25 per tonne in the mid-1980s to more than \$100 per tonne and rising in some large urban areas.

But even if your organization can afford the price of their waste, the environment cannot. Buried in landfills, your garbage decomposes into "leachate," an often toxic chemical soup that can poison our underground and surface drinking water supplies. Your papers, plastics and old batteries burned in old or improperly functioning incinerators pollute the air with carbon dioxide, the prime contributor to global climate change, and often unsafe levels of other toxic emissions such as dioxins and furans.

To prevent further degradation, governments are moving quickly to mandate the "3Rs" — reduction, reuse and recycling — for waste generated in the commercial, institutional and industrial sectors. All three "R" actions are important and can take place concurrently (rather than consecutively), but their order of priority must be clearly understood: First, *reduce the quantities of material used*. Next, *reuse existing materials as much as possible*. Finally, *recycle used materials to secondary markets* wherever possible.

We are deceiving ourselves if we rely only on recycling to cope with our waste crisis.

Most provinces have committed to a goal of 50-percent diversion of waste from landfill (and in the case of Ontario, incineration) by the year 2000. For example, along with the federal government, the provinces have adopted the National Packaging Protocol (see sidebar) for cutting packaging waste in half by the end of this decade. Among the many municipalities setting new tough standards for minimizing waste, Metro Toronto has, over five years, raised its tipping fees from \$18 to \$150 a tonne. And it has banned from its landfills primary loads of cardboard, fine paper, recyclable wood waste, scrap metal, drywall, tires, white goods (refrigerators and stoves) and clean demolition rubble.

Every year, businesses in Canada pitch out 6.6 million tonnes of garbage. That's enough to fill 2300 football fields to the top of the goal posts.

Each year, the Toronto area produces about 90,000 tonnes of construction waste.

Garbage collection and tipping fees have soared over recent years. If it costs \$150/tonne to haul away garbage, an organization with 1,000 employees each producing an average of 135 kilograms, faces an annual garbage disposal bill of \$20,250.

Clearly our perception of waste must change. Once considered worthless, "garbage" should be seen for the actual value it contains. It is a secondary resource that can be used — and re-used — to make the products we need in our society. Soon our greatest discoveries of new oil will be found in tires and plastics we throw away, our highest grade ore bodies in the aluminum, copper and steel we mine from our waste. Using secondary resources saves energy, and relieves the need to dam more rivers and build more coal-burning electric plants that produce acid rain. The same products we make from trees and aluminum bauxite ore, for example, can be made out of recycled paper and "used" aluminum with just a fraction of the energy.

Practising the 3Rs with your waste not only saves the environment, it saves you money. Instead of having to pay a \$150-a-tonne to dump what you thought was waste, you can actually profit by selling these precious materials to recyclers to serve our needs again and again.

You can begin to reap these benefits by formulating, then implementing a workplace waste action plan:

YOUR WASTE REDUCTION ACTION PLAN

Read through the Target Areas and Actions for waste reduction, reuse and recycling. Then decide how many you can apply to your own workplace by conducting an assessment of waste in your operations. You can do this yourself, using the Waste Assessment Worksheet, or obtain the services of a competent environmental consulting firm or environmental group.

Once you know where the waste is — and where the savings can be made — record the areas needing attention and actions to be taken in the Action Planner. The Action Planner, provides a strategic plan tailored to your workplace. Some measures you'll want to implement right away, others will need further evaluation, but first create a "Workplace Green Team" of participants representing each part of your organization. There are lots of ways to coordinate, but involve staff and delegate. (See "How to Use the Workplace Guide and Get Started" Chapter.) Assign a captain to every applicable Target Area and Action, and set dates for Green Team progress reports.

TARGET AREAS AND ACTIONS

With so many wastes to deal with, it helps to develop a 3Rs system for one type, then apply it to the rest. Use this comprehensive model for paper and cardboard to implement the rest of your waste action plan.

NATIONAL PACKAGING PROTOCOL

The federal government and the provinces have developed and endorsed the National Packaging Protocol (NAPP), which sets out guidelines for reducing packaging waste by 50 percent by the year 2000. Interim targets have also been set, requiring by the end of 1992, 20 percent less packaging by volume than in 1988 and by 1996, 35 percent less.

While the protocol is voluntary, some of the provinces intend to incorporate the reduction targets in new legislation. NAPP places special emphasis on reduction and reuse. Half of the above diversion rates are to be achieved through reduction and reuse, the other half through recycling or recovery. According to NAPP, 5.7 million tonnes of packaging were disposed of in 1988, or

Area: PAPER AND CARDBOARD

**Action: START A 3RS
PROGRAM — REDUCE,
REUSE, RECYCLE**

Since paper and cardboard create the majority of most organizations' waste, representing anywhere from 16 to 50 percent of the garbage put out the back each week³, make them the first target of your 3Rs program. You'll have several types of paper and cardboard stock to deal with:

- fine papers, such as those used for computer printing, typing, photocopying, faxing (if you have the new kind that uses paper, not thermo-fax)
- cardboard stock, usually corrugated and brown, such as the cartons used to deliver your office supplies
- box board, such as small cases containing pens and staples
- manila envelopes, file folders and plasticized report covers
- thermo-fax paper, for the more common fax machines
- paper towels.

A MODEL WORKPLACE 3RS PROGRAM Follow these seven steps for your paper and cardboard, then expand the program to your other wastes.

QS

1. BEFORE PROCEEDING WITH RECYCLING, IMPLEMENT PROGRAMS TO REDUCE AND REUSE

There are many effective ways to reduce and reuse paper and cardboard in the workplace:

- ☐ Purchase or lease a double-sided photocopier. It will pay back any extra capital cost within a short period of time as you dramatically reduce expenditures for photocopy paper.
- ☐ Save discarded drafts, reports or letters printed only on one side. Place in a separate container, a "green tray," to later use the blank, unspoiled side in photocopiers and single-sheet printers.
- ☐ Reuse envelopes, particularly manila envelopes, applying address labels made of recycled paper and water-based glue. Avoid purchasing plastic-windowed envelopes, which cannot be recycled. Envelopes are now available with an "empty" window.
- ☐ Send messages or internal memoranda to fellow employees by electronic mail through the computer system, instead of by paper memo or circulate one copy to all staff. Use voice mail, as well.
- ☐ Make fewer copies of speeches and reports for meetings, conferences, and general mail-out. Instead, offer to provide them on request. You'll save on printing and mailing costs, and you'll know the person wants the material.

.6 kilograms per person per day. The protocol would allow only 2.34 million tonnes to be discarded by the year 2000.

See "Sources," to contact the National Task Force on Packaging for more information. ◀

Every four years, an area of Canadian forest equal in size to Vancouver Island is cut down.

☐ If you've changed addresses or titles, and your large supply of stationery has become unusable, contact a local charitable or environment group. They will use your old envelopes and fine paper. Or cut the papers down to use as scratch pads. And don't forget the "green tray" for draft copies.

☐ Replace paper towels with cloth towels in washrooms of small organizations. In larger organizations, contract a supplier of continuous cloth-roll dispensers (but insist that the machines are regularly serviced with clean rolls).

☐ Ask your suppliers to deliver goods in returnable, reusable plastic containers made from recycled plastics, and strong wire "boxes" instead of cardboard boxes.

☐ Institute a newspaper-share system throughout the organization (many organizations' libraries attempt this, but don't monitor its progress). If newspaper subscriptions are an employee perk, make sure everybody on the list actually wants or is reading them. (Same goes for hotels that deliver newspapers unsolicited to their guests.)

☐ When possible, purchase fax machines that use fine paper, not thermal fax paper.

☐ Reuse cardboard cartons. Properly cared for and stored, they can be used three to five times before being deposited in the recycling bin.

Q5

2. APPOINT A RECYCLING COORDINATOR AS PART OF YOUR ORGANIZATION'S GREEN TEAM. It is crucial to involve interested staff to share the workload and generate enthusiasm. Make sure to include a representative from the cleaning staff and the union. In fact, participation of all sections of the organization is preferable.

3. FIND OUT HOW MUCH WASTEPAPER AND CARDBOARD IS GENERATED. Collect two weeks' worth of paper and cardboard stock from different sections of your organization. Sort it, and weigh the sorted piles. Multiply by the appropriate number of weeks to derive ballpark monthly and annual volumes. (Canadians use over two million tonnes of cardboard a year.)

4. ESTABLISH A MARKET AND ARRANGE A SALES CONTRACT. Wastepaper dealers are listed in the Yellow Pages under *Recycling Centres*. Also, for paper and any other 3Rs inquiry you have, contact your provincial recycling council. If you don't have one, call your

WHY GLOSSY'S NO GOOD

Many magazine and report covers (often inside pages too) contain a high level of clay content, giving them that glossy look. But the clay and other specialized chemicals used in their production are not generally compatible with the recycling process. In an interesting development, some of the newer de-inking and repulping operations can use a small

amount of magazines and tolerate the excess clay content. For example, Quebec and Ontario Paper Co. in Thorold, Ontario, accepts a small amount of magazine feedstock for making its recycled newsprint, but not enough to accommodate a major volume. If magazines and reports have clay or plasticized covers, but regular fine or newsprint

municipal works department or a major environmental group in your community. The organization with a great deal of information is the Recycling Council of Ontario:

Recycling Council of Ontario
489 College St., Suite 504
Toronto, ON
M6G 1A5
(416) 960-0938
Toll Free: 1-800-263-2849 (in Ontario)

Wastepaper dealers generally differentiate grades of paper. What they will pay fluctuates depending on the market and its stability. They typically pay in the order of \$200 per tonne for computer paper, the most valuable. Next is other white, fine office paper that is well-segregated and uncontaminated. Contaminants include bits of plastic, plastic-windowed envelopes, sticky back labels, glue bindings and tape bindings on old reports, slick magazine paper and pieces of cardboard. Thermal fax paper, because of its chemical content, cannot be recycled, and is therefore a contaminant. Magazine and glossy paper (including photographs) is another contaminant; though it can, in some instances, be recycled, there is no established market for it as yet (see sidebar on glossy paper). And for the time being, box board is also unwanted, unless you generate great quantities of it.

You can recycle manila envelopes and old file folders as part of what is called low-grade "mixed paper." Mixed might also include junk mail, coloured fine paper, even white fine paper if you don't bother to separate it. Depending on the content and level of contamination, if any, you can receive a range of prices, from zero for low-grade contaminated; up to \$40 a tonne for low-grade mixed unsorted papers with some contaminants (your recycler will specify which may be acceptable); and higher still for low-grade mixed uncontaminated. These prices are paid directly by the paper buyer. Often, however, if you don't generate sufficient volumes, paper brokers will only offer to take the paper off your hands for free. Some may even charge you a nominal amount of \$5 to \$15 per tonne, knowing they are saving you tipping fees of \$150 for every tonne they take away.

Newspapers can cost you as much as \$15 a tonne for pick up or pay you up to \$30 a tonne — it depends on the dealer, the distance from market and where in the country you are situated. However, as a result of governments' demands that newspapers be sold with a fixed recycled content, usually between 30 and 60 percent, a very strong secondary market for old newspapers is firming up.

*paper inside, you can rip off the covers and recycle the rest
in either the fine-paper bin or newspaper bin. ◀*

The City of Ottawa is looking into changes to its building codes requiring all new commercial and institutional buildings to be designed to accommodate recycling.

WHEN YOU CONTACT THE WASTEPAPER DEALER, FIND OUT:

- minimum quantity required for collection and the preferred grades of paper
- the price per tonne for mixed paper and separated paper
- the conditions for collection by dealer such as in boxes or bags, location for pick-up, etc.
- acceptable types and levels of contaminants, for example, some paper manufacturers consider laser printed paper a contaminant
- price the dealer pays you, or the cost for collection, the duration of agreement and frequency of collection
- if the dealer provides all or some of the equipment you need to set up a program, from desktop used-paper boxes and office central-sorting bins, to planning manuals and back-of-the-building storage facilities. Depending on your quantities of paper and cardboard, you may even need a baler.

5. ESTABLISH A STORAGE AREA AND DESIGN A RECYCLING SYSTEM It is important to find enough space to store separated fine papers, newspapers, and cardboard. Most old buildings don't have enough space. New buildings should be designed to accommodate the separation and storage of recycled goods. The storage space should meet fire and safety codes.

Your wastepaper dealer will likely require you to separate the materials into five grades:

- computer printout paper
- other white fine paper
- coloured mixed paper, including coloured fine paper, manila envelopes, file folders, junk mail. Remember to cut out plastic windows on envelopes and strip any plastic or tape contaminants off paper. Check with waste dealer about other contaminants too.
- corrugated cardboard
- newspapers (remove magazines and glossy advertising inserts)

Design a system that fits the particular approach of your organization. For example, you can:

- Institute desktop recycling. Each employee collects and sorts papers into the first three grades (as well as cardboard and newspaper if they have need to), and collects them in small containers in their office or work area.
- Set up central-sorting bins into which employees discard their materials, again separated according to grade. The bins most commonly used are large burlap bags inserted inside barrels. When filled, the bags are removed and replaced by empty ones.
- If you don't require a bin for cardboard, flatten clean used cardboard boxes, and store in a designated area for pick-up. If you generate large volumes of cardboard, look into getting a small baler (unless your waste dealer can supply one).
- Shop around if you have shredded fine paper to discard. Because it is about three times less dense than unshredded paper, most recyclers don't want it. Those that do require major volumes and special practices.

If all the paper consumed in Canada each year were recycled, 80 million trees would be saved and about 35 percent of our waste would be diverted from landfill.

- Determine how and who will move materials to storage areas, coordinate recycling program with cleaning staff.

6. EDUCATE STAFF AND IMPLEMENT PROGRAM A good education program is essential if your office recycling program is to work. A formal program is most important in large offices; it can be less formal in smaller offices where communication is easier.

- Utilize a variety of education tools: posters, lunchtime information sessions, video programs, and newsletter articles.

- Train at all levels; senior management, employees and staff of contract services.

- Plan follow-up campaigns to reinvigorate employees. After the initial rush of enthusiasm, interest tends to wane.

- Get environmental groups involved — it's a good way to build relationships and retain enthusiasm. Support them too.

(See "Education and Training" Chapter for more information.)

QS

7. PURCHASE PAPER PRODUCTS WITH POST-CONSUMER RECYCLED MATERIAL CONTENT It's not enough to just recycle paper. Your organization must be a part of the sustainable-development process and purchase paper made with post-consumer secondary fibre. (Pre-consumer recycled material is paper fibre that has been reprocessed at the paper mill, never having entered the consumer stream. Buying this does not help very much since it does not recover paper that has been sold and used, and is destined for the garbage pile.) Recycled paper is suitable for most uses. If in some cases it is a bit more expensive, (for example 100% post consumer paper), the environmental benefits justify the extra cost. These costs can be recovered through paper recycling and more efficient use. As supply and demand increase, these papers are becoming much more competitive.

- Check the quantity and quality of the recycled content in the paper before you buy. A label reading "recycled" does not guarantee a high or even adequate content of post-consumer fibre. It may be made from 95-percent virgin fibre from trees, and only five percent from recycled fibre. Or it may be all pre-consumer fibre.

- Ask for paper and paper products with at least 50-percent post-consumer fibre content.

- Purchase paper towels (if you must have them) and toilet paper made from 100 percent recycled paper. For markets in Canada, Atlantic Packaging of Scarborough, Ontario, makes these products from recycled fine paper to be sold under a variety of different brand names.

**Area: OTHER WASTE
MATERIALS PROGRAMS**

**Action: DEVELOP 3RS FOR
EACH MATERIAL**

Using the same coordinator-team approach, expand your waste reduction, reuse and recycling plan to include the four other material sectors:

- ☐ glass, metal and plastic containers and packages
- ☐ compostable organics, including food, yard and garden wastes
- ☐ heavy materials including pallets, wood waste, drywall, demolition wastes, and tires
- ☐ hazardous and liquid wastes, including batteries, acids, solvents, paints and cleaners

**Area: GLASS, METAL, AND
PLASTIC CONTAINERS
AND PACKAGING**

Action: REDUCE AND REUSE

In Ontario, approximately 100,000 laser printer cartridges are thrown out each month; at about one kilogram a piece, that's 100,000 kilograms every month taking up space in a landfill — and growing.

First, determine what your organization can reduce, then reuse. The fewer containers and packaging you purchase, the more you save on your garbage bill. Here are some ideas:

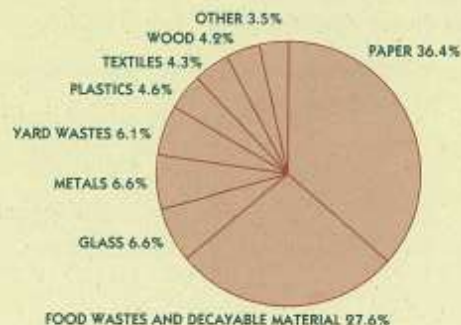
- ☐ Avoid buying office supplies in blister packs (with the clear plastic bubble over the product attached to the boxboard backing). If you cannot find alternatives (bulk cartons, or loose), raise the matter with your office-goods supplier.
- ☐ Reduce, if not eliminate, the use of throwaway pens. Choose, in this order, fountain pens that draw ink from the bottle, fountain pens that use cartridges, and ballpoint pens that use refills. If you have to use a single-use throwaway type, be sure it is long-lasting. Don't buy those that are cheap and contain very little ink.
- ☐ Anywhere you serve food or drink in your organization, avoid single-serving creamers and packs for sugar, condiments, salt and pepper. All these items can be served in large washable reusable containers. (For offices without refrigerators, gauge the size of cream carton that will serve your needs by day, and replenish daily.)
- ☐ Do away with one-use disposable foam, plastic and paper cups, along with plastic stir sticks. Ceramic cups (supplied either by your organization or each employee) are easily rinsed and used again, as is cutlery. Same goes for plates, whether food is served from your cafeteria or by caterers.
- ☐ Develop a garbageless lunch program for staff, in which they replace the paper bag with a reusable lunch box or bag, the throwaway juice container with a washable thermos, the wax paper and cellophane sandwich wrappers with an air-tight plastic sandwich container, and the single-wrapped candy bar with unpackaged homemade cookies. Encourage employees who head to the mall for prepackaged snacks and lunches to join in on the garbageless lunch by asking for the cooperation of the food vendors.
- ☐ Where possible, purchase refillable soft-drink containers, and containers with deposit return systems.
- ☐ Instead of throwing away once-used photocopier and laser printer toner cartridges, send them to companies that will refill them and sell you or your supplier refilled cartridges. (See "Hazardous Materials" Chapter). Also, if your photocopier uses copy cartridges, check to see if the manufacturer has a recycling program in place.

QS

CANADA'S WASTE STREAM

(The composition may change from province to province, and from city to city. These figures have been rounded off and do not add up to 100%.)

Source: Environment Council of Alberta, Canadian Consumer, April 1991.



**Area: GLASS, METAL
AND PLASTIC**
Action: RECYCLE

While continuing to place priority on reduction and reuse of materials, continue your 3Rs program by recycling. Remember: recycling is the third choice in your 3Rs program — and some recycling efforts do not allow continuous re-use of materials. For example, this is the rationale for recommending glass beverage containers as the preferred choice.

Each waste sector will require its own recycler (or recyclers), with the exception of organic wastes, which for the most part, will be dealt with in-house.

GLASS

All non-refillable glass containers can be recycled.

- ☐ The glass may need to be sorted into bins for clear (also called flint) and colour (usually green and brown), depending on the recycler. Sorted glass can sell for between \$35 and \$60 per tonne.
- ☐ Instruct all staff to keep glass that is meant for recycling segregated from contaminants such as broken pieces of pottery or lightbulbs (whose bits of ceramic and metal filament can spoil a whole load of glass) and metal caps. Try to prevent glass from breaking or shattering — this also helps to prevent contamination.
- ☐ Window pane and other flat-glass products are not accepted as yet by glass recyclers.
- ☐ If your organization is too small to attract the services of a glass recycler, encourage employees to help by taking their used glass bottles and jars home to their recycling boxes or to recycling depots. Be sure to consult your local municipality.

METALS

The most common types of metal beverage containers are made of aluminum and tin-plated steel.

- ☐ Place metal-can recycling bins in the cafeteria, common rooms and/or in central areas on each floor of your organization. Make sure they are emptied once a week into a larger container in your storage area for pick-up by the recycler. (Again, if your organization is too small to institute such a system, encourage employees to take their cans home to the recycling box or depot.)

OTHER METAL SCRAP

- ☐ Contact scrap metal dealers to pick up out-moded equipment, construction metal, pieces of copper wiring, junked vehicles and white goods such as refrigerators and air conditioners, and aluminum siding. Contact your provincial recycling council for more information.
- ☐ Call your local municipality to see if there is (or is being developed) a program for recycling white goods such as stoves and refrigerators. These require special handling, since they are loaded with insulation, and some with ozone-depleting refrigerants.

Major white-goods recycling in North America is being done by the Appliance Recycling Centres of America (ARCA), which is operating in five cities; the centre in Milwaukee, Wisconsin, handled 54,000 appliances in 1989.⁴

PLASTICS

Technology exists to recycle some plastics but in Canada it's still a very limited industry — processing facilities and markets for recycled plastics are just being developed. In most areas, no plastics are being recycled because of the distances to market. In other places, the capabilities exist to deal only with certain types, most commonly high-density polyethylene (HDPE), plastic film, engineered resins, and polyethylene terephthalate (PET).

- ☐ Depending where you are located, you may be able to recycle:
 - liquid detergent, bleach and ammonia containers and squeeze containers (e.g. for condiments).
 - clear PET containers (for soft drinks and other beverages).
 - plastic shopping bags. At present, very little plastic film (which is what one-way shopping bags are made of) is being recycled in Canada. The Plastic Films Industry Recycling Group has been formed to expand the effort.
 - foam-cup and foam-plates. At present, very little foam-plastic recycling is being done in Canada, though a new plant in Mississauga, operated by the Canadian Polystyrene Recycling Association, will focus its efforts on recycling polystyrene from Ontario commercial packaging and food service sites.
 - juice boxes. New technology is making it possible to recycle these packages made up of laminated boxboard, aluminum foil and plastic into "superwood," a mixture of recycled and new plastics that can substitute for wood in park benches, fences, floors and so on. There are now two superwood recycling plants in Canada, two more planned, and home-collection systems are being piloted here and there.

Like other plastics, the full infrastructure for collection and processing of juice boxes is not in place, except on a limited basis.

- ☐ As yet, you cannot recycle laminated plastic containers such as plastic refill pouches containing soaps and other liquids, or plasticized milk cartons.
- ☐ See "Sources" to contact the Environment and Plastics Institute of Canada for more information on which plastics you can or can't recycle in your area.

Area: ORGANIC WASTES

Action: RECYCLE BY COMPOSTING

Food, lawn and garden wastes make up the second-largest waste sector going to landfill after paper and cardboard. Yet food scraps from your cafeteria or restaurant, and wastes from grounds maintenance can readily be composted into fertile top soil enhancers. Organizations large enough to generate significant quantities will save the \$100 plus-per-tonne tipping fee they now pay, and composting on any scale helps to replenish topsoil and reduce the use of petroleum-based fertilizers.

- ☐ Store compostable materials in well-sealed containers so they do not leave odours, attract vermin or in any way become a health hazard in the workplace. Encourage staff to take home their own compostables.
- ☐ Segregate compostable materials from non-compostable. For example, meat and poultry scraps are not advisable in composters because they attract vermin. Also, be sure that compostable materials are not contaminated with potentially harmful wastes such as oils, solvents or plastics.

- ☐ If you have adequate space on your grounds, set up a compost bin (or bins, as needed). This could be a container as simple as a four-foot-high "corral" built with two-by-four lumber (to a width and length that will accommodate your estimated volumes), a bag of composting starter, and a pitch fork. Call your municipality for advice.
- ☐ Purchase commercial composters. Get help in selecting a composter from your provincial recycling council, local environment groups or gardening organizations. Check with your municipality for guidelines and advice.
- ☐ Participate in the establishment of a large mechanical rotary composting unit that can service a whole region. Such composters would have the capacity to accept restaurant, hotel and cafeteria food wastes, as well as wastes from grounds maintenance.
- ☐ You may be able to arrange to have restaurant or banquet kitchen wastes collected by farmers.

**Area: PALLETS AND
CONSTRUCTION
WOOD WASTE**

Action: RECYCLE

Pallets with broken wooden slats were almost always thrown away. Now, with higher landfill costs, and landfill bans, they are more economical to repair. If yours are unrepairable, you can:

- ☐ Contact a waste-wood recycler. Many types of waste wood, including pallets, can now be sorted and run through modern heavy chipping machines. (The chips are used for animal bedding, in gardens and even pulp production.) Metro Toronto, for example, will take sorted wood at half the landfill cost of \$150 and chip it at central facilities. Wood that has been used to make concrete forms is also recyclable.
- ☐ Segregate unrecyclable wood. If painted or pressure-treated, it can't be recycled because of its potential toxic effects. Get advice from recyclers on proper disposal.
- ☐ If your organization generates a large amount of wood waste, contact your local municipality or the provincial recycling council for details on recycling opportunities.

Area: DRYWALL

Action: RECYCLE

Drywall or gyproc made primarily from gypsum can be ground and remade into drywall. In Canada, there is a drywall-recycling plant in the Vancouver lower mainland, and another recently established in the Metro Toronto area, where it is expected to process an initial 80,000 tonnes a year.

- ☐ If you are having construction done or yours is a construction company or a demolition operation, segregate excess drywall for recycling. Take the lead in getting your business association to organize a program and investigate the availability of recycling plants.

**Area: OTHER
CONSTRUCTION AND
RENOVATION MATERIALS**

Action: RECYCLE

Tearing down old concrete and brick buildings for new construction generates a tremendous amount of waste, which is banned from landfill in some municipalities. There are now recycling companies that will grind construction rubble into new aggregate to be used for future construction.

- ☐ If yours is a construction company, or your organization is responsible for generating demolition materials (site expansion, renovations, etc.), arrange for a recycling company to deal with the waste. See "Sources."

QS

Area: TIRES
Action: RECYCLE

The old days of giving your worn-out tires to the dealer or the tire jockey for disposal are gone. Most landfills have banned them because tires have a tendency to bounce up no matter how deep they are buried or how much they are compacted. Now you pay to send them to special tire graveyards — in Ontario, that amounts to \$6.50 per tire handling and disposal charges, \$5 as provincial tax, and \$1.50 as handling taxes for the Rubber Association of Canada, the primary agency for tire recycling.

Fortunately, a fledgling tire-recycling industry is developing in Canada. Recyclers are shredding tires, or turning them into crumb rubber to make products like sports tracks, rubberized playgrounds, truck mud flaps and auto motor sound barriers. The steel rims are also recycled.

❑ Investigate the market for your worn-out fleet tires. There are at least two major Canadian companies that are planning to recycle millions of tires a year: National Rubber in Toronto and Viceroy Trent Rubber and Plastics Ltd. in Peterborough, Ontario. See "Sources," to contact the Rubber Association of Canada for more information. (See "Transportation" Chapter.)

**Area: HAZARDOUS MATERIALS
AND WASTE**
Action: RECYCLE

The imperative of any waste action plan, especially one for hazardous materials, is to minimize use and reuse resources where possible. For detailed guidelines, see "Hazardous Materials" Chapter.

When you have reduced and reused all you can, you must take great care in recycling your remaining hazardous materials: you want to a) keep them out of the environment and protect human health, and b) keep them from contaminating the clean recycling streams like compostables and wood wastes.

❑ Establish collection and storage systems for dry-cell batteries used in flashlights, cameras and other electronic equipment. Many municipalities have special depots or toxic pick-up systems for batteries, solvents, pesticides and paints. Call your municipal government to arrange for transfer or to encourage a new program.

❑ Find lead recyclers to deal with wet-cell batteries from cars, trucks and boats. The lead they contain can be made into new batteries. Canada Metal in Toronto and Tonelli in Etobicoke, Ontario are among Canada's few lead recyclers.

❑ Clean and reuse solvents, dry-cleaning fluids and certain chemical solutions, such as photo-developer solution. This can be done either on-site or off-site. Learn how by contacting the Canadian Waste Materials Exchange and/or your provincial waste management corporation. (See "Sources" for details.)

❑ Establish a collection and storage system for used lubricating oil, either on your own or in association with partner organizations, for eventual delivery to re-refiners. (Service stations recycle their own waste lubricating oil, but usually won't accept yours for fear of its possible contamination from other more toxic oils. If you collect your own, be sure not to mix with other materials.) Filtered and cleaned of their dirt and contaminants (which, at times, can include dioxins and furans), re-refined lubricating oils are as good as new.

See "Sources," to contact Canadian Association of Re-Refiners for more information.

SUCCESS STORIES

THE MUTUAL GROUP The Mutual Group Insurance Co., based in Waterloo, Ontario, launched a volunteer employee-recycling program that has diverted 53 percent of the company's waste from landfill. Mutual Group occupies a 20-storey building with 2,300 staff in downtown Waterloo. The program, organized by a team of 92 employees, succeeded in recycling 21 tonnes of cans and bottles and 282 tonnes of fine papers annually. The company projects savings of about \$18,000 a year on its waste disposal bill.³

BELL CANADA Bell Canada, with 55,000 employees, established a corporate greening program to reduce its company's impact on the environment. Bell uses 45,350 tonnes of paper annually, 80 percent of it in telephone directories. At least 50 percent of the paper it now purchases contains recycled material, and all of the envelopes and bills sent out to Bell's seven million customers are made from recycled fibre. The company is also experimenting with pallets made from recycled plastics. And its fleet of 12,000 vehicles is using 50-percent recycled oils, or about 125,000 litres a year.⁴

REMANUFACTURING AND RECYCLING CARTRIDGES In the past, used copy and toner cartridges for laser printers and photocopiers ended in landfills. Fortunately, there are now alternatives.

Xerox Canada Ltd. has a multi-faceted environmental program. One recent initiative has been implementation of a recycling program for copy cartridges (used in some photocopiers). Upon request, Xerox Canada Ltd. will send a free return kit to cartridge users. Used cartridges are sent to a central location in Canada, then to a U.S. plant to be recycled.⁵ For more information, call the Xerox Supply Marketing Centre at 1-800-822-2200.

Canon Canada Inc. has joined with Hewlett-Packard and Federal Express in support of an international initiative to divert toner cartridges from landfill to the recycling stream. The Canadian component of the project was announced in January of 1991 and sends spent cartridges to an overseas recycling plant. Although recently started, the goal of the project partners is to reuse or recycle 95 % of returned cartridge units. For each cartridge returned, \$ 1.00 is donated to a joint program of the World Wildlife Fund (Canada) and the Nature Conservancy of Canada.⁶ For more information call Hewlett Packard at 1-800-387-3154, or your local Canon Canada Inc. dealer or Federal Express branch.

QUAKER OATS In little more than three years, The Quaker Oats Co. of Canada, situated in Peterborough, Ontario, cut its waste generation by 75 percent (from 4500 tonnes to 900 tonnes) and saved an annual \$976,000.⁷

Sometimes all it took was a simple change of procedure. For example, instead of marking up and throwing away packaging taken off production for quality-control inspection, Quaker placed a removable sticky-back on each of the samples that wouldn't permanently mark them. That way they could be returned to the production line. This change alone saved the company \$15,000 a year.

WESTIN BAYSHORE HOTEL, VANCOUVER The Westin Bayshore Hotel in Vancouver has become a national demonstration project for environment-wise building management. Among its many tasks is to reduce the waste it generates by recycling fine paper, glass, kitchen oil fats, and corrugated-cardboard. The hotel is also conducting a pilot composting project using the food scraps from its hotel kitchen and restaurant facilities with three composting units installed at the back of the hotel next to the waste compactor.¹⁰ This was an Environmental Partners Fund project.

BIG IS BEAUTIFUL First Canadian Place (FCP) in Toronto is the largest office building in Canada. Seventy-two storeys high, FCP generates 36 tonnes of garbage a day. In 1975, Olympia and York, owners of FCP, launched an aggressive recycling program. Today, on a daily basis, only 9 tonnes garbage go to landfill and 27 tonnes are recycled.

Cardboard is baled and sold; computer printout is separated, baled and sold; food scraps from the many restaurants and food services are collected for pick up and use for pig feed by a farmer; glass bottles are collected; and wooden pallets are set aside for reuse.

In all work areas, tenants received recycling bins to place along side their normal waste baskets to recover fine paper, bottles and cans.

According to the senior property manager "the revenues from recycling cover the cost of disposing of the remaining garbage. Any profit from the sale of recyclables is returned to the tenants in the form of a rent rebate."¹¹

STICKING TO WASTE REDUCTION LePage's new environmental policy "The Environment and LePage Initiatives" includes commitment to waste reduction.

Blister cards are being redesigned reducing "blister board" requirements by 15 percent. Plant and office paper recycling programs have reduced solid waste by as much as 50 percent. A "glue box" program for schools is designed to recover glue bottles and gluesticks for future refilling or recycling.

NORTHERN TELECOM — AN UNABASHED SUCCESS In one short year, the Northern Telecom plant in Calgary reduced its waste going to landfill by 50 percent.

- Waste chemicals were reduced by 60 percent. Consumption (therefore, purchase) was reduced and some chemicals were recovered and sent back to suppliers for recycling.
- Paper consumption was reduced by 30 percent and over 50 tonnes of waste fine paper and cardboard were recovered for recycling.
- The cafeteria is moving away from disposables.
- Programs were implemented to recover and recycle beverage cans and bottles; metals, especially copper wire; kitchen grease and industrial oils; and wooden pallets.

"Employee attitudes toward the program have evolved from polite scepticism to unabashed enthusiasm."¹²

HIGH FLYING 3RS Canadian Airlines International now recovers and recycles 14.5 tonnes of fine paper every month from its Vancouver Operations Centre.

In addition, flight attendants have initiated on board recycling programs for cans, bottles and newspapers. By way of example, 12 tonnes of aluminum cans, or 756,000 cans, were recycled in 1990.¹³

SHIPPING CONTAINERS GO ROUND AND ROUND Briggs and Stratton ships its engines in reusable containers. When the customer, such as a hardware store, receives the engine, they simply dismantle the container and ship it back to Briggs and Stratton — unlike the old system which left the customer with the responsibility, and cost of disposing of cardboard and wooden pallets.

This new container eliminates the use of 14.7 million square feet of corrugated cardboard a year — equivalent to 920 trees.¹⁴

GET CRACKING Export Packers of Winnipeg processes about 1.3 million eggs a day in manufacturing dehydrated egg powders. And each day, they generate about 6.8 tonnes of egg shells. Until 1984, these shells were hauled away to a local dump at an annual cost of \$40,800.

In 1984, Export formulated a new product “Egg Shell Meal”, a calcium and protein compound for chicken feed — closing the recycling loop and providing an additional \$110,000 in annual sales.

Additional costs for equipment were \$125,000 representing a payback of less than a year (\$40,800 in avoided landfill costs and \$110,000 in additional revenue).¹⁵

TEAM UP WITH OTHER 3RS PROGRAMS

Consider merging your recycling efforts with those of other organizations in your vicinity, especially if you're part of an industrial park, a shopping mall, or an office complex. To begin, your recycling committee or coordinator should approach the other organizations individually, or through the mall or industrial park association, to establish an overall recycling program. Then, jointly solicit the support and participation from the property managers of your complex. (See “Property Management” Chapter.)

That way you can:

- collect larger volumes of recycled secondary materials, thus attracting better deals from recyclers.
- share the cost and space for storage and recycling at a convenient spot within the complex.
- combine training sessions and share expertise.

FOOTNOTES

¹ "Reduction and Reuse: The First 2Rs of Waste Management." Factsheet prepared by the Waste Management Branch, Conservation and Protection, Environment Canada, February 1990, Hull, PQ.

² "Three Rs Best Rx for Office Waste." Bruce Gates. *The Financial Post*, March 22, 1991, Toronto.

³ *The Office Guide to Waste Reduction and Recycling*. Pitney Bowes and Recycling Council of Ontario. Toronto 1990.

⁴ "Company Specializes in White Goods," *Ontario Recycling Update* Vol. X, No. 2, March/April 1990. Recycling Council of Ontario, Toronto.

⁵ "Employee Enthusiasm Cuts Waste by 53% for Mutual Group," *Ontario Recycling Update*, Vol. X, No. 4, July/August 1990. Recycling Council of Ontario, Toronto.

⁶ "Three Rs Best Rx For Office Waste" Bruce Gates. *The Financial Post*, March 22, 1991, Toronto.

⁷ "Xerox and the Environment: Doing Well By Doing Right", *Benchmark*, Summer 1991.

⁸ Canon's Clean Earth Campaign, Canon Canada Inc., Release 1991.

⁹ Quaker Oats, Jon Grant, Release, Vancouver, March 22, 1990.

¹⁰ "Report of An On-Site Visit of the Westin Bayshore Hotel." Harmony Foundation, 1990.

¹¹ *Ontario Recycling Update*. Recycling Council of Ontario, Toronto, May/June 1989.

¹² *Waste Minimization Guidelines*. Northern Telecom, May 1990.

¹³ *ECO-LOG Week*, Corpus Information Services, Toronto, June 15, 1990.

¹⁴ *ECO-LOG Week*, Corpus Information Services, Toronto, August 17, 1991.

¹⁵ "Success Stories Bank Towards Sustainable Development", Environment Canada, November 8, 1989.

SOURCES AND REFERENCES

The availability of information in both French and English varies depending on its source and purposes. References and publications are presented in the language in which they were provided.

NATIONAL

The Rubber Association of Canada
89 Queensway W.
Toronto, ON, L5B 2V2
(416) 270-8322

Canadian Association of Re-Refiners
Box 1261, Station A
Toronto, ON, M5W 1G7
(416) 466-5653

Environment and Plastics Institute
of Canada (EPIC)
The Society of the Plastics Industry
of Canada
1262 Don Mills Rd., Suite 104
Don Mills, ON, M3B 2W7
(416) 449-3444

Pollution Probe Publications
12 Madison Ave.
Toronto, ON, M5R 2S1
(416) 926-1907

*Profit from Pollution Prevention, A Guide
to Waste Reduction and Recycling in
Canada. Volume 1, Second Edition.*
Toronto. Pollution Probe. 1990.

Canadian Association of Recycling
Industries (CARI),
50 Gervais Dr.
Toronto, ON, M3C 1Z3
(416) 510-1244

Association based on membership from
across Canada and the United States.
Liaison with the government, concerning
the import and export of hazardous waste.
The provincial governments generally have
jurisdiction over environmental protection
related to the proper handling of waste,

and in some cases have incentive programs
for waste reduction and recycling
programs. The regional governments are
responsible for the management and
operation of landfill sites. Some supply
information and assistance to business,
which is often more hands on and
practical in its application.

National Task Force On Packaging
Environment Canada
Place Vincent Massey
351 St. Joseph Blvd., 12th Floor
Hull, PQ, K1A 0H3
(819) 953-1712

Implements the agenda for action designed
to achieve reduction in packaging as
outlined in the agenda of the Task Force
on Packaging.

Canadian Waste Materials Exchange
(CWME)
ORTECH International
2395 Speakman Dr.
Mississauga, ON, L5K 1B3
(416) 822-4111

CWME publishes a national waste-
exchange bulletin, *Canadian Waste
Materials Exchange*, six times a year.
Subscription fee: \$60 per year. Listings
are free.

Energy Pathways Inc.
ON-SITE Project
251 Laurier Ave. W., Suite 500
Ottawa, ON, K1P 5J6
(613) 235-7976

The ON-SITE program places unemployed
but skilled professionals in companies,
salary-free, for a limited term to assist
with waste management.

FEDERAL

Environment Canada
Inquiries Centre
Ottawa, ON, K1A 0H3
General Inquiries: (819) 997-2800

Fact sheets and booklets mailed on
request.

BRITISH COLUMBIA

Ministry of Environment
810 Blanchard St.
Victoria, BC, V8V 1X5
General Information: (604) 387-9966
Municipal Solid and Biomedical Waste
Branch: (604) 387-9977

Has developed the Solid Waste Enterprise
Initiative Financial Assistance Program,
which provides loans and loan guarantees
to B.C.-based recycling industries involved
in municipal solid waste and innovative
technology.

Recycling Council of British Columbia
102 - 1525 West 8th Ave.
Vancouver, BC, V6J 1T5
(604) 731-7222

Provides information on recycling
opportunities in the province.

B.C. Waste Exchange
102 - 1525 West 8th Ave.
Vancouver, BC, V6J 1Y5
(604) 731-7222

B.C. Waste Exchange is operated by
Recycling Council of British Columbia.
There is no membership fee to use the
exchange or to receive the quarterly
newsletter, which lists waste wanted and
waste available.

Recycling Hotline
In Greater Vancouver: (604) 732-9253
Toll free: 1-800-667-4321

Imagination Market
528 Powell St.
Vancouver, BC, V6A 1G9
(604) 253-1033

The market collects manufacturers' cast-offs for resale as arts and crafts materials. Similar outlets exist in Nanaimo, B.C., and Edmonton, Alta.

Municipal Solid and Biomedical Waste Branch
British Columbia Ministry of Environment

A Market Development Plan for Recyclable Materials in British Columbia. Technical report prepared for the Ministry by Peat Marwick Stevenson & Kellog and Recycling Development Corporation. April 1990.

ALBERTA

Department of the Environment
Oxbridge Place,
9820 - 106th St.
Edmonton, AB, T5K 2J6
General Information: (403) 427-2739
Waste Management
Division: (403) 427-5842
Recycling Division: (403) 427-5838

Alberta Waste Materials Exchange (AWME)
Alberta Research Council
P.O. Box 8330, Postal Station F
Edmonton, AB, T6H 5X2
(403) 450-5408

AWME provides a free quarterly bulletin that lists waste wanted, waste available and services available.

SASKATCHEWAN

Air and Land Protection Branch
Department of the Environment and Public Safety
Walter Scott Building
3085 Albert St.
Regina, SK, S4S 0B1
General Information: (306) 787-6113

Municipal Waste Unit: (306) 787-6487
Information on waste disposal in the province.

Municipal Waste Reduction Unit: (306) 787-6209

Information on alternative waste-reduction options such as recycling, including a recycling directory and office-recycling guides for commodities such as fine paper. This unit administers the legislation for beverage-container deposits.

MANITOBA

Manitoba Environment
Building 2, 139 Tuxedo Ave.
Winnipeg, MB, R3N 0H6
General Information: (204) 945-7100
Waste Reduction Branch: (204) 945-7344
Information line: 1-800-665-8885
(in MB); 942-7781 (in Winnipeg)

A new provincial strategy on waste management has recently been developed that includes the new Waste Reduction and Prevention Act. For more information on programs, contact the Waste Reduction Branch.

Manitoba Waste Exchange (MWE)
1329 Niakwa Rd. E.
Winnipeg, MB, R2J 3T4
(204) 257-3891

MWE is run by the Biomass Energy Institute and funded by Manitoba Hazardous Waste Management Corporation and Manitoba Environment. It publishes a bulletin three times a year listing companies that have waste for sale; these listings are also forwarded to the Canadian Waste Materials Exchange for inclusion in its bulletin. MWE also provides information on reduction, recycling, and disposal of waste.

ONTARIO

Comprehensive Funding, Industrial Program Unit
Waste Management Branch
Ministry of the Environment
4th Floor, 40 St. Clair Ave. W.
Toronto, ON, M4W 1M2
(416) 323-5180

Ontario Ministry of the Environment offers information, technical advice and grants to assist initiatives in reduction, reusing, recycling and recovery.

Ontario Ministry of Environment
Waste Management Branch
40 St. Clair Ave. W., 5th Floor
Toronto, ON, M4V 1P5

Guide for Implementing an Office Waste Paper Recovery Project.

Ontario Waste Management Corporation (OWMC)
2 Bloor St. W., 11th Floor
Toronto, ON, M4W 3E2
(416) 923-2918

Industrial Waste Audit and Reduction Manual

OWMC videos: *The Competitive Edge* explains the six steps of an audit in clear simple terms (18 minutes). *Money Down the Drain* applies the 4Rs to liquid industrial and hazardous wastes in five Ontario plants (17 minutes). VHS and Beta. \$24 each.

Waste Reduction Bulletin. Subscription free of charge.

Ontario Waste Exchange (OWE)
ORTECH International
2395 Speakman Dr.
Mississauga, ON, L5K 1B3
(416) 822-4111

OWE is operated by ORTECH (formerly the Ontario Research Foundation) and funded by Ontario Waste Management Corporation and Ontario Ministry of Environment. OWE has many free services to industry, including technical assistance, recycling information, and waste-for-exchange listings in *Canadian Waste Materials Exchange* bulletin.

Recycling Council of Ontario (RCO)
489 College St., Room 504
Toronto, ON, M6G 1A5
(416) 960-0938;
Toll free (Ontario): 1-800-263-2849

RCO provides information on a vast array of recycling options in Ontario. In past, it has focused mainly on the residential sector, but it is starting to develop information, such as a recycling markets directory, for the industrial, commercial and institutional sectors. RCO runs an extensive resource centre, open to the public weekdays, between 1 p.m. and 5 p.m.

Your Office Paper Recycling Guide.
Published jointly by Toronto Recycling Action Committee and Metropolitan Toronto Works Department. Available from Recycling Council of Ontario.

Department of Engineering & Works
City of Ottawa, 1600 Scott Street
2nd Floor, Ottawa, ON, K1Y 4N7
(613) 564-1119

Office Paper Recycling: A Building Manager's Guide. May 1990.

Pitney Bowes representative or call
(416) 424-2211 or contact Recycling
Council of Ontario (416) 960-0938.

The Office Guide to Waste Reduction and Recycling, a 32-page guide (and poster) sponsored by Pitney Bowes and written by Recycling Council of Ontario.

Consumers Glass
777 Kipling Ave.
Toronto, ON, M8Z 5Z4
(416) 232-3000

Can provide advice and information on handling, sorting and transporting glass. A technical manual called *A Report on Glass Recycling in Ontario* is available on request.

Metropolitan Toronto Works Department
480 University Ave.
Toronto, ON, M5G 1Y8
Commercial Industrial Waste Reduction
Hotline: (416) 392-4200

The municipality provides over-the-phone information to the commercial and industrial sectors; mail-outs include the *Metropolitan Toronto Recycling Markets Directory*, recycling information, and application form for a free waste audit.

QUÉBEC
Ministère de l'Environnement
Direction de la récupération et du recyclage
2360, chemin Sainte-Foy
Ste-Foy, PQ, G1V 4H2
(418) 643-4115

Quebec Ministry of Environment funds "le Programme d'Aide à la Réduction des Déchets Solides (PARDS)" (program for solid-waste reduction). PARDS provides grants to businesses, non-profit groups and municipalities to conduct public education on waste reduction, establish recycling programs, and develop markets for recycled commodities.

NEW BRUNSWICK
Operations Branch
Department of the Environment
364 Argyle St., P.O. Box 6000
Fredericton, NB, E3B 5H1
(506) 457-4848;
General Information: (506) 453-3827

The Operations Branch provides information on recycling and waste-reduction opportunities over the phone or by mail. The province has been developing an integrated solid-waste management program, and has created 12 regions in the province to manage solid-waste issues.

NOVA SCOTIA
Recycling Officer, Municipal Waste and Resource Recovery
Department of the Environment
5151 Terminal Rd., 5th Floor
P.O. Box 2107
Halifax, NS, B3J 3B7
(902) 424-5300

The department provides information on recycling and solid-waste management in the province.

Recycling Coordinator
Metropolitan Authority
5077 George St.
Halifax, NS, B3J 1M3
(902) 421-8576

Contact for municipal information.

PRINCE EDWARD ISLAND
Department of the Environment
Jones Building, 4th floor
11 Kent St., P.O. Box 2000
Charlottetown, PE, C1A 7N8
General Information: (902) 368-5000
Environmental Protection Branch:
(902) 368-5029

The department provides information on solid-waste programs in the province.

NEWFOUNDLAND

Director of Environmental
Investigations Division
Department of the Environment
Confederation Building
West Block, P.O. Box 8700
St. John's, NF, A1B 4J6
(709) 729-5783;

General information: (709) 729-3394

The department provides information on
solid-waste management in the province.

NORTHWEST TERRITORIES

Department of Renewable Resources
Pollution Control Division
P.O. Box 1320
Yellowknife, NT, X1A 2L9
(403) 873-7654

This division administers the pollution
legislation in the territory.

YUKON TERRITORY

Conservation and Protection Division
Environment Canada
P.O. Box 6010, 100 Hamilton Blvd.
Whitehorse, YT, Y1A 5L7
(403) 667-3400

This division provides information on
recycling, as well as proper waste
management, of solid and hazardous
waste.

Information and Education Coordinator
Department of Renewable Resources
Government of Yukon Territory
(403) 667-5237

The department is in the process of
developing a territorial Environment Act.

Recycling Centre of the
Yukon Conservation Authority
P.O. Box 3968
Whitehorse, YT, Y1A 5M6
(403) 667-7269

Recycling Centre of the Yukon
Conservation Authority oversees all
operational aspects of recycling in the
territory, and will provide information
on recycling options.

WATER

QUICK START

What can you do, starting today, in your workplace to conserve water and protect its quality?

Quick Start provides easy-to-implement actions, providing excellent environmental benefits and potential cost savings:

QUICK START

FOR MORE INFORMATION

- | | |
|---|---|
| ■ Educate employees to conserve water: e.g. turn off taps when not in use; don't run water unnecessarily. | Look for QS [symbol] on page 72. |
| ■ Educate employees on which products should not be flushed down the toilet or poured down the drain. Provide environmentally sound alternatives. | Look for QS on page 75. |
| ■ Install flow restrictors and aerators on all taps. | Look for QS on page 73. |
| ■ Repair all leaks. | Look for QS on pages 72, 74. |
| ■ Water lawns only when necessary. It's best to water less often but more thoroughly and in the early morning or early evening. | Look for QS on page 73. |

While you are developing a comprehensive environmental strategy and setting priorities for long-term goals, the Quick Start measures will help you get started. Implement as many of the target areas and actions found in this Chapter as possible.

The Rime of the Ancient Mariner,
Samuel Taylor Coleridge



WATER IN YOUR WORKPLACE



YOUR WATER USE IS COSTING YOU AND THE ENVIRONMENT

Being the fortunate custodians of 20 percent of the world's freshwater supply, we might be forgiven for believing that our water in Canada is limitless. But the fact is about half of our water is in glaciers and polar ice.¹ In other words, a precious 9 percent — which provides drinking water for millions of people and is used for transportation, industry and commerce, power generation, agriculture, commercial fishing and recreation — is constantly recycling through the environment. It typically enters your workplace from a municipal source, and leaves through flushing and drains. While in some communities it passes through municipal sewer and treatment plants, in others it returns directly to its source without treatment — to be reused again and again.

Our water supply is not limitless — or self-cleaning. So when we waste it or contaminate it, *we* pay the premium, forcing up the costs of collecting, purifying and resupplying it. Water rates are ridiculously low (encouraging overconsumption), but many municipalities are now increasing them to reflect the burden we are placing on that all too vulnerable resource. Even at current rates, a leak as small as this dot • in your operation can cost you \$200 and waste 200,000 litres of water in one year.²

Even if we didn't waste our water — which we do — its contamination by hazardous waste carries a tremendous cost. In Ontario alone, an estimated 12,000 industries discharge wastes, including chemicals, into municipal sewer systems, making sewage one of the largest sources of toxic contamination in the Great Lakes. Even treated sewage is not necessarily free of hazardous materials. These pollutants, along with other by-products of human activities, are putting intolerable stress on the quality of our surface and underground waters and jeopardizing the health of aquatic ecosystems and the chain of life that they sustain. For example, much of the 300 or so million litres of motor oil used in Canada that is not re-refined, gets poured down garage drains and into storm sewers or is landfilled.

To protect and restore these vital freshwater sources, disposal of fewer and fewer workplace wastes are permitted out the industrial pipe or down the sewer. The call for zero discharge of industrial toxins is starting to be heard by environment ministries cross-country. Many provincial and municipal governments already regulate materials that can be sewered. For example, the Ontario Ministry of the Environment has a model

A frog does not drink up the pond he lives in.

- an old saying

by-law that can be adopted by municipalities, prohibiting the use of dilution to meet discharge limits, prohibiting the discharge of specific hazardous wastes, adding new limits for heavy metals, and requiring industries to report spills.³

Regulations and by-laws are one form of persuasion, but why not common sense? Once we understand that what we do to water ultimately comes back to affect us, the importance of conserving it and protecting its quality becomes crystal clear. By reducing water consumption, you reduce your bills and the need for expanded treatment plants. By reducing the hazardous materials that go down the drain, you help reduce the cost of making our water drinkable again — and our waterways liveable for every creature that relies on them. Without clean water life, including ours, is unsupportable.

You can begin to reap these benefits by formulating, then implementing a workplace water action plan:

YOUR WATER ACTION PLAN

Read through the following Target Areas and Actions for conserving and protecting the quality of your water. Then find out how many you can apply to your own workplace by conducting an assessment of water use throughout your operations. You can do this yourself, using the Water Assessment Worksheet, or obtain the services of a competent environmental consulting firm or environmental group.

Once you've assessed where and how you could improve your water use, record the areas needing attention and actions to be taken in the Action Planner. The Action Planner, provides a strategic plan tailored to your workplace. Some measures you'll want to implement right away, others will need further evaluation, but first create a "Workplace Green Team" of participants representing each part of your organization. There are lots of ways to coordinate this, but do involve staff and delegate, (see "How to Use the Workplace Guide" Chapter). Assign a captain to every applicable Target Area and Action, and set dates for Green Team progress reports.

TARGET AREAS AND ACTIONS

Area: **EMPLOYEE PERSONAL WATER USE**

Action: **USE LESS**

For washrooms and if your workplace has drinking fountains or shower facilities, the following measures can dramatically cut your water waste and use.

- ☐ Instruct, then remind employees with posted signs to turn off taps *completely* (remember the cost of one small but steady drip). Appoint monitors to check taps at close of business (so they don't drip all night).
- ☐ Instruct, then remind employees with posted signs, not to run water unnecessarily. Use only what it takes to rinse cups, wet toothbrushes or quench thirst. In fact, it's better to keep a pitcher of water in the staff refrigerator than to run the tap for a few minutes. (The exception is that water which has been standing for several hours in metal pipes with certain solders can contain heavy metals from the pipe and/or solder. Early-bird employees should run the tap for two to three minutes if using the water for drinking or cooking, but you can collect it for watering plants).
- ☐ Repair leaks immediately, and replace worn washers at the first sign of wear.
- ☐ Check, and adjust if necessary, timing cycles and quantities of flushing systems on urinals and toilets. Timing cycles should correspond with work schedules, shutting down these systems during off-hours (assuming there isn't a lot of employee overtime in off-hours).

Total water use in Canada averages about 4,000 litres per person per day. Of that, about 285 litres is for direct personal use, and about 3,715 litres is required by the industrial, commercial and institutional sectors which serve us.

About 7.6 percent of Canada is covered by fresh water, approximately 20 percent of the world's fresh water.

QS

❑ Install low-flow restrictors and aerators, as well as automatic shut-off valves on taps. A restrictor reduces the flow from about 12 litres per minute to 7 litres per minute (an approximate 60-percent reduction). Many existing taps have screen aerators, but these are not the same as a low-flow aerator, which improves the efficiency of the flow, so that it works just as well with less water. Ask your plumbing supplier to check which type you have, and replace if necessary.

❑ Install low-flow showerheads. These units deliver the same cleaning action but use up to two-thirds less water. You'll save on hot-water energy at the same time. Generally, the cost for new showerheads ranges between \$20 and \$100. Aerated showerheads mix in air to maintain the water pressure, and spray like a standard shower. Non-aerated showerheads pulse the water, and feel like a massage shower. Certain low-flow showerheads also have a shut-off button, allowing you to stop and restart the flow of water (while shampooing, for example).

❑ Install toilet dams in toilet reservoirs:

■ If your operation has a manageable number of toilets, you can make your own dam for each by placing one or two plastic containers filled with stones in the reservoir, displacing about 4 litres of water. That means instead of using 20 litres per flush (conventional toilet), it uses 16 litres. (Never use bricks.)

■ Purchase commercial toilet dams and water-saving devices from specialty plumbing or hardware suppliers at a cost of \$5 to \$25 each. The dams do not displace water, but create a central reservoir that ensures pressure remains high for flushing efficiency while reducing water usage per flush to 12 litres or less — a 40-percent reduction. Other water-saving devices reduce the amount of water (by 25 percent) that escapes from the reservoir to complete each flush.

❑ When you renovate or are building new space, install low-flow toilets that use between 4 to 10 litres per flush, less than 50 percent of conventional toilets.

❑ Choose drinking fountains that flow only on demand (e.g. by foot pedal) versus free-running models. (Avoid water coolers — they flow on demand, but use electricity to keep the water cool.)

❑ Bonus — much of the water saved is hot, reducing your energy bill too.

Area: OUTDOORS WATER USE

Action: USE LESS

QS

Maintaining grounds and the exterior of buildings can waste a lot of water: but smart management of your workplace grounds can ensure you don't use more water than is essential.

❑ Lawn watering, except in the case of newly planted sod or seeded areas, shouldn't be necessary. Grass naturally turns brown and goes dormant during dry periods and it is particularly important to conserve water at these times. The grass will recover during autumn rains.

❑ Properly maintained lawns can survive summer dry periods. Reduce your existing lawn's need for water through sound turf maintenance: aeration, top dressing, fertilizing (with organic matter) and proper mowing (no more than once a week and set blade height on mower at 5 to 8 centimetres), will produce hardier grass, capable of surviving hot, dry periods.

It takes approximately 3,000 litres of water to produce 1 barrel of crude oil.

It takes approximately 770,000 litres of water to produce 1 tonne of high quality book paper.

It takes approximately 250,000 litres of water to produce 1 tonne of steel.

QS

Commercial catches of high-value species from the Great Lakes dropped from 50 percent of total catch in 1891 to three percent in 1980.

- ☐ During dry periods, watering trees and shrubs is a better use of water than lawn watering. During hot weather when there hasn't been rain for a few weeks, watch for stress in the leaves. When they begin to curl — it's time to help the plants by watering. Trickle irrigation is the most efficient way to get water to the roots and wastes less from evaporation. Handwater annual flower beds.
- ☐ A long term solution is to convert large areas of lawn to alternatives such as rock gardens, perennial ground covers, shrubs, and trees. Choose plants which are hardy for your area and use mulches which will reduce evaporation of moisture.
- ☐ Install shut-off and efficient nozzles on all hoses.
- ☐ If you currently use automatic sprinklers on your grounds, review the controls for frequency, timing, and volume. Put a few plastic containers under the sprinklers and record the amount of time it takes them to supply 2 to 3 centimetres of water. Set the controls to shut off after this time. Also program the system so that you can override it after rainstorms.
- ☐ Evening and overnight watering reduces loss from evaporation.
- ☐ Check sprinkler positions to make sure the water is getting to your greenery, not watering the side of your building or the sidewalk.
- ☐ Buy trickle, or soaker, irrigation hoses for garden beds. These have a series of small holes along their length, which allow direct contact with the lawn and garden, and can be buried in the root zone of plants to minimize water loss. Oscillating sprinklers lose as much as 50 percent of their water delivery to evaporation. Choose sprinklers which deliver large droplets of water rather than a fine mist.
- ☐ Fix leaky outside taps, hoses and hose connections.
- ☐ Using brooms, rather than hoses, to clean your building exterior, walkways and sidewalks will save water.
- ☐ If you have eavestroughs, disconnect from the sewer and direct the water spout onto your lawn. This will reduce your need to water, and help to protect streams and rivers from large damaging pulses of storm water.
- ☐ If yours is a low-rise building with modest grounds, collect rain water from your roof into barrels for occasional watering.
- ☐ Mulch as much as you can: leave grassing cuttings on the lawn (a mulcher mower finely chops up grass clippings) and place an 8-to-15 centimetre layer of recycled wood chips around trees and plants to retain moisture and reduce soil temperature.
- ☐ Build new parking lots with permeable asphalt or interlocking bricks, both of which allow water to flow back into the ground. This helps to recharge groundwater, which feeds streams.

**Area: KITCHEN AND LAUNDRY
WATER USE**

Action: USE LESS

If you operate a hotel or hospital, your cooking and washing needs demand inordinate amounts of water. Many other organizations have kitchen and/or fitness facilities — all requiring water-guzzlers such as dishwashers and laundry machines. So it pays to tighten up your water use wherever you can.

- ☐ Check all taps, couplings, hoses, and so on for leaks and repair immediately.
- ☐ Purchase energy-efficient dishwashers and laundry machines that have a variety of settings, including water-saving cycles and load-size selection.
- ☐ Avoid small loads in dishwashers and laundry machines (unless, in the case of laundry machines, you can adjust the water level to the size of load). You want to avoid filling the whole machine with water for half a load.

Area: ALL WATER DISCHARGES

**Action: PROTECTION OF
QUALITY**

QS

Fish in James Bay contain higher levels of mercury than anywhere else in the world.

More than 350 chemical compounds have been found in the Great Lakes.

If you care about the quality of water you drink, then you must take care of the water leaving your workplace — because eventually it cycles back to you.

☐ Instruct, then remind employees with posted signs, to avoid using toilets and drains to dispose of *any* hazardous material — starting today. Post signs in washrooms, kitchens, garages and maintenance areas listing the substances banned from drain disposal such as used motor oil, solvents, old paints and toxic cleaners. These can either be taken to a waste exchange or other proper-collection-and-treatment facility. Phone your municipal public works department or provincial environment agency. (See “Sources”.) For information on waste exchanges, see “Hazardous Materials” and “Waste” Chapters.

☐ Store hazardous materials well away from drains, in proper, well-sealed containers and in a secure area.

☐ Instruct your purchaser or cleaning staff to choose cleaning products that are: low-phosphate, made with citrus or plant-based builders, and are non-hazardous. And, of course, use the minimum amount of any kind of cleaning product. Ask your suppliers to provide information on the content of their products. See phosphates sidebar, “Hazardous Materials” Chapter.

☐ Where sanitation standards are not at risk, replace the cleaning products you use with a few simple cleaners. Some common ingredients you can use include borax, baking soda, and vinegar. Information on specific uses and mixtures is readily available. Consult Debra Lynn Dadd’s *The Non-Toxic Home* (Jeremy Tarcher Inc., Los Angeles, 1986), Harmony Foundation’s *Home & Family Guide* or Friends of the Earth’s “Clean House, Clean Earth” Poster (Ottawa, Ontario). (See “More Sources”.)

THE COST OF WATER

Canadians pay a bargain price for water use compared with other countries. We pay approximately \$0.36 per 1,000 litres of water used, compared with \$0.42 in the U.S., \$0.66 in England, \$1.33 in West Germany and \$1.47 in Australia.* The price paid for water also varies widely across Canada. Nevertheless, it is relatively cheap.

There are four basic types of municipal rate structures for water:

- flat rate: a fixed charge regardless of the volume of water used*
- declining block rate: a declining charge as consumption increases through a series of “blocks”*
- constant rate: a price for each unit (eg. litre) of water used*

CONT'D

Area: PROCESS WATER

Action: CONSERVATION

Many organizations, such as photolabs, restaurants and hotels, require large amounts of water in their processes. Process water can be used for cooling, or as a component in the production itself. Cooling water can often be recycled again and again, in what is known as a "closed-loop" system. Because it picks up heat in the cooling process, the heat can also be recaptured, which results in further energy savings. See "Energy" Chapter, for more information on hot-water conservation.

As well, if water is used in the production process, it may be possible to reduce the water used, reduce contaminants in the discharge and reuse treated water within the original process. Many major water users are moving toward instituting closed loop systems in their workplace, to recycle and reuse this resource. And in cases where these methods aren't easily applied, there may be alternative uses for uncontaminated process water, such as watering the grounds. These suggestions will help you get started conserving process water.

Fixing one dripping tap reduces water consumption by approximately 25 litres/day.

SUCCESS STORIES

SHERATON CENTRE — SERIOUS ABOUT SAVING WATER The Sheraton Centre in Toronto is a 139,000 square metre, modern complex of hotel, conference facilities, restaurants and retail shops. A look at the Sheraton's balance sheet shows that water conservation is good for the environment, and the bottom line.⁶

Action	Water Savings (million litres/yr.)	Cost Savings (\$/yr.)
low-flow showerheads	89.1	\$58,800
use of steam condensate in laundry	67.0	\$45,000
reduce cooling tower losses (to evaporation)	12.0	\$ 8,200
use of steam condensate in decorative fountain	1.8	\$ 1,200

NO MORE SPILLED MILK The Agrinove Dairy in Beauceville, Quebec used to dump 188,000 litres of waste milk into the Chaudiere River each month. By installing more efficient production procedures, Agrinove drastically improved its waste picture while reducing pollution stress (eutrophication) on the Chaudiere.⁷ CONT'D

increasing block rate: an increasing charge as consumption increases through a series of "blocks"

About 71 percent of rate schedules provide either: (1) no financial incentive to conserve water — with flat rates — or (2) a decreasing incentive to conserve — with declining block rates.⁴ ◀

Since 1979, about 500 wells in New Brunswick have been contaminated by leaking fuel tanks.

Where do those 188,000 litres now go each month?

- improved efficiency reduced waste from 188,000 litres to 118,000 litres;
- of this, 65,000 are recovered, pasteurized and sold as hog feed;
- the balance is treated biologically, stored in vats and eventually sold as soil fertilizer.

SPACE AGE WATER CONSERVATION Bristol-Aerospace of Winnipeg, Manitoba saves water. A number of measures have been implemented recently to cut back on consumption.

Conductivity controllers were installed in rinse tanks. Instead of continually supplying fresh water to ensure rinse water is clean, these controls only add fresh water when contamination levels rise above a specific set point.

These controllers reduced water consumption in rinse tanks by over 90%.

FOOTNOTES

¹ *Water: the Emerging Crisis in Canada*, H.D. Foster and W.R.D. Sewell, James Lorimer and Company, Toronto, 1981.

² *Water Conservation in Massachusetts: The Time is Now*, Resource Management Associates Inc., Boston, 1982.

³ *Model Sewer-Use Bylaw*, Ontario Ministry of the Environment, 1988.

⁴ *Water Works*, Factsheet No. 14, Environment Canada.

⁵ *Municipal Water Rates in Canada, Current Practices and Prices*, Environment Canada, 1989.

⁶ "The Sheraton Centre: Synergy In Efficiency of Water, Energy and Labour Use," *Ontario Energy Network*, Vol.9, Association of Municipalities of Ontario (AMO), Summer 1989, p.10.

⁷ *Success Stories Bank Towards Sustainable Development*, Sustainable Development Branch, Environment Canada, April 2, 1990.

SOURCES AND REFERENCES

The availability of information in both French and English varies depending on its source and purpose. References and publications are presented in the language in which they were provided.

INTERNATIONAL

Greater Boston Chamber of Commerce.
Boston, Massachusetts.

Water Conservation in Massachusetts. Guidelines for establishing water management programs for industry, business, hotels, motels and resort facilities. 1982.

FEDERAL

Engineering & Development Division
Inland Waters Directorate
Environment Canada
Ottawa, ON, K1A 0H3

Environment Canada publishes a listing of more than 300 showerheads, toilets, toilet-tank inserts, and low-flow aerators available from distributors in Canada. Note: Information is provided by the manufacturers; efficiency claims have not necessarily been verified. Write for listing.

Acting Director, Water Planning and Management Branch
Inland Waters Directorate
Environment Canada
351 Boul. St. Joseph
Hull, PQ, K1A 0H3
(819) 997-2071

The federal government has implemented no programs or incentives for water conservation. It does provide information on request, including a booklet, *Water: No Time To Waste*.

BRITISH COLUMBIA

Water Management Branch
Ministry of the Environment
Parliament Buildings
Victoria, BC, V8V 1X5
(604) 387-3392

To date, the B.C. government has not implemented a program of incentives or subsidies to encourage water conservation in industry, commercial ventures or government institutions.

During the 1980s, some regions of the province, particularly the Okanagan Valley and the Cariboo Plateau, experienced successive years of below-normal precipitation, and developed public information campaigns to promote conservation measures.

ALBERTA

Section Head, Water Conservation
Ministry of the Environment
9820-106 St.
Edmonton, AB, T5K 2J6
(403) 427-2371

The Alberta government has implemented no incentives for water conservation, but is involved in public education on the subject. Its conservation efforts have centred around irrigation issues and water metering. At present, Edmonton has water meters, while Calgary does not.

SASKATCHEWAN

Manager of Public Affairs, Sask Water
111 Fairford St. E.
Moose Jaw, SK, S6H 7X9
(306) 694-3900

Sask Water provides information and literature on water conservation to individuals, communities, and industry. In recent years, Regina has conducted extensive public-relation campaigns for water conservation. Other cities with community-awareness programs include Swift Current and Weyburn.

MANITOBA

General Manager, Manitoba Water Services Board
PO Box 1059
Brandon, MB, R7A 6A3
(204) 726-6073

Manitoba Water Services Board is the provincial funding agency for municipal-water systems. It encourages municipalities to promote water conservation, and to adopt water metering and realistic water pricing. At present, the board is identifying communities in which to implement a municipal water-conservation pilot program in cooperation with the federal government.

ONTARIO

Water Resources Branch
Ministry of the Environment
1 St. Clair Ave. W.
Toronto, ON, M4V 1K6
(416) 323-4941

Water Resources Branch deals primarily with water-quality issues and preservation of wetlands, and does not offer any programs, for the moment, on water conservation.

Water Conservation Coordinator
Water Supply Operations, Engineering Department
Regional Municipality of Waterloo
Marsland Centre, 7th Floor
Waterloo, ON, N2J 4G7
(519) 885-9434

Regional Municipality of Waterloo has conducted extensive education campaigns on water conservation, and developed programs of regulations and incentives for home builders who incorporate water-saving devices into their designs.

Water Efficient Fixtures Catalogue. 1988. (Limited distribution.) The region offers a \$75 rebate to each new residence in which water-efficient plumbing fixtures are installed, and publishes a catalogue to assist builders and plumbers in choosing approved fixtures.

QUÉBEC

Direction des communications
Ministère de l'Environnement
3900, rue Marly
Sainte Foy, PQ, G1X 4E4
(418) 643-8806

To date, the ministry has concentrated on watershed protection and water-quality issues. Programs specifically designed for the conservation of water are being developed, and may be available in the near future.

Directeur Général
Associations Québécoises des
techniques de l'eau
407, rue Saint-Laurent, bureau 500
Montréal, PQ, H2Y 2Y5
(514) 874-3700

This organization develops and distributes information on water conservation, and conducts public-information campaigns.

NEW BRUNSWICK

Information Officer, Department of
the Environment
P.O. Box 6000,
Fredericton, NB, E3B 5H1
(506) 453-3700

The department focuses primarily on water-quality issues and watershed protection. Presently, no programs or initiatives for water conservation exist.

NOVA SCOTIA

Manager, Water Resources Services
Department of the Environment
P.O. Box 2107
Halifax, NS, B3J 3C8
(902) 424-8584

Water Resources Services deals primarily with water quality. In June of 1991, the Minister's Task Force on Clean Water released a report, *Clean Water for Nova Scotia: New Directions for Water Resource Management*. This document surveys Nova Scotia's current situation, what its people expect and makes recommendations for new directions in water management.

PRINCE EDWARD ISLAND

Director, Water Resources Branch
Department of the Environment
P.O. Box 2000
Charlottetown, PE, C1A 7N8
(902) 368-5038

Water Resources Branch deals primarily with resource protection and water-quality issues. It also distributes, in cooperation with Environment Canada, literature and publications on water conservation.

NEWFOUNDLAND

Director, Water Resources Division
Department of Environment and Lands
P.O. Box 8700
St. John's, NF, A1B 4J6
(709) 576-2563

Water Resources Division deals primarily with water quality, though it has begun to disseminate some information on water conservation.

NORTHWEST TERRITORIES

Manager, Community Works
Department of Municipal and Community
Affairs
Government of the Northwest Territories
Yellowknife, NT, X1A 2L9
(403) 873-7335

The department manages the water and sewer subsidy program for all communities that have drinkable water systems. It also conducts studies on water-use patterns, and makes recommendations on the use of low-water-consumption appliances and water-saving devices such as low-flow showerheads and faucets.

Chairman, Northwest Territories
Water Board
P.O. Box 1500,
Yellowknife, NT, X1A 2R3
(403) 920-8191

Any industrial/commercial water consumer of more than 50,000 gallons/day is required to apply to the NWT Water Board for a license. The licensing process includes public hearings, an inter-agency review, and a description, prepared by the licensee, of water-conservation measures to be undertaken.

YUKON

City Engineer, City of Whitehorse
2121 2nd Ave.
Whitehorse, YT, Y1A 1C2
(403) 668-8305

Currently, Yukon Territory has no programs or incentives for water conservation, but the City of Whitehorse is developing a package of strategies to be implemented at the municipal level.

T R A N S P O R T A T I O N

QUICK START

What can you do, starting today, to improve commuting and transportation?

Quick Start provides several easy-to-implement actions, providing excellent environmental benefits and potential cost savings.

QUICK START

FOR MORE INFORMATION

- | | |
|--|--|
| ■ Encourage employees to walk, bike or bus to work — conduct a 'green commute' campaign. | Look for QS [symbol] on page 87 |
| ■ If you operate a fleet, ensure your vehicles are well maintained to save fuel. | Look for QS on page 83 |
| ■ Switch to re-refined motor oil for your fleet. Look for products which meet EcoLogo standards. | Look for QS on page 84 |
| ■ Investigate converting your fleet to alternative fuels. | Look for QS on page 82 |
| ■ Use phone, conference calls and electronic mail as an alternative to (some) business travel. | Look for QS on page 86 |
| ■ Reduce effects of air conditioning | Look for QS on page 85 |

While you are developing a comprehensive environmental strategy and setting priorities for long-term goals, the Quick Start measures will help you get started. Implement as many of the target areas and actions found in this Chapter as possible.

"Big Yellow Taxi," by Joni Mitchell
Reprise Records, 1969

T R A N S P O R T A T I O N I N Y O U R W O R K P L A C E



YOUR TRANSPORTATION IS COSTING YOU AND THE ENVIRONMENT

If you own and operate a fleet, if your employees rely on private automobiles to get to and from work, if your organization has become an all too-frequent flyer, then you know as well as the next person how dependent we've become on the combustion engine to conduct our daily business. The problem is, with 16.3 million vehicles on Canada's roads¹, nearly 23,000 private and commercial airplanes in our skies², together burning billions of litres of fossil fuel a year that foul our atmosphere, it's become far too expensive a habit — for you and the environment.

The minute one of your fleet takes to the street with an ill-tuned engine or soft tires, your gasoline or diesel bill rises. Whenever airline seats are booked for business meetings that could have been convened as a tele-conference, your organization is spending more than it needs to. Every day employees motor into the parking lot with empty passenger seats, their earnings are being wasted. Ever-rising fuel costs ensure that the price organizations pay for making environmentally unsound transportation choices will continue to increase.

Those unsound choices also make us poor in ways beyond dollars and cents. Cars and trucks are the single largest source of urban smog and of the "greenhouse" gases that are contributing to global climate change. The automobile is fuelled by an expensive and non-renewable resource — petroleum. The roadway and parking network required has forced the paving of precious greenspace and farmland. Indeed, automobiles and their support network are the single largest demand on the world's natural resources, and a major source of pollution and hazardous waste. The average driver trails a plume of poisonous exhaust, synthetic rubber-tire dust, oil drippings, and ozone-destroying refrigerants that escape from air-conditioners.³

What a wonderful world it would be if everyone again lived and carried out their business near their place of work, reducing the need for such polluting vehicles. But short of banning the automobile, we can take steps, mandatory and voluntary, to better the situation. Our governments are now threatening or legislating tougher emission standards, tire taxes and gas-guzzler taxes to minimize the environmental impact of future generations of vehicles. You can minimize the impact of existing forms of workplace transportation — your fleet, employee travel, courier services — by using them more conservatively, by being more efficient when you use them, and by finding more effective alternatives to their use.

The findings of a study conducted by the Ontario Ministry of Transportation in the Greater Toronto Area concluded that 78.7 percent of the autos carry only one person."

Area: PURCHASING FLEET CARS, VANS AND TRUCKS

Action: SELECT ENERGY EFFICIENT VEHICLES

The switch to unleaded gasoline may have saved large tracts of trees in U.S. northeastern forests. A decade ago, scientists feared that the buildup in soil of lead, which is toxic, would damage and possibly kill trees. But 15 years after the U.S. Clean Air Act forced automakers to market cars that burn unleaded gasoline, scientists say lead concentrations in the forest floor already are falling."

QS

The more prudent and creative you are in making environmentally friendly transportation choices, the fewer resources you'll waste, both natural and financial. You can begin to reap those benefits by formulating, then implementing a workplace transportation action plan:

YOUR TRANSPORTATION ACTION PLAN

Read through the following Target Areas and Actions for improving transportation practices. Then find out how many you can apply to your own workplace by conducting an assessment of transportation use throughout your operations. You can do this yourself, using the Transportation Assessment Worksheet, or obtain the services of a competent environmental consulting firm or environmental group.

Once you've assessed where and how you can improve work-related transportation, record the areas needing attention and actions to be taken in the Action Planner. The Action Planner, provides a strategic plan tailored to your workplace. Some measures you'll want to implement right away, others will need further evaluation, but first create a "Workplace Green Team" of participants representing each part of your organization. There are lots of ways to coordinate this, but involve staff — and delegate (see "How to Use the Workplace Guide and Get Started" Chapter). Assign a captain to every applicable Target Area and Action, and set dates for Green Team progress reports.

TARGET AREAS AND ACTIONS

Fuel efficiency varies dramatically among vehicles. Some cars and delivery vans use *less than half* the gasoline that others need to travel the same distance. A fuel-consumption guide detailing each available model's performance can be obtained by writing:

Transport Canada
Public Affairs Branch
580 Booth St.
Ottawa, ON
K1A 0E4

WHEN PURCHASING A NEW FLEET AUTOMOBILE:

- ☐ Ask yourself if the primary use of the new vehicles will be highway or around-town driving. Then check the appropriate fuel-efficiency rating — in Canada, vehicles are rated for both kinds of driving, and different vehicles are more efficient for different uses. Ask yourself if the job can be done by a smaller vehicle.
- ☐ Choose a model that is most fuel-efficient for its size and classification — both operating costs and air pollution will decline. (As well, automakers have voluntarily put a five-year, 80,000-kilometre warranty on vehicle pollution-control systems.)
- ☐ Consider switching to vehicles that use alternate fuels such as natural gas and propane. Natural gas is considered the best alternate fuel because it burns cleaner than propane, producing fewer carbon dioxide emissions. It is a much more abundant resource than petroleum and is much cheaper to run per kilometre travelled.
- ☐ Of the provinces, only Ontario offers a dual-fuel conversion sales-tax rebate of up to \$1,000 for converting new vehicles to use either propane or natural gas in addition to gasoline.
- ☐ The federal government offers a \$500 grant for conversion to natural gas only, (See Sources).

In Canada, half of all the oil used powers our transportation system. Within this system, 80 percent of all energy used is consumed by road vehicles.¹

- The public re-fuelling infrastructure is limited, but growing. Installations are available for business or institutional fleets.

- Avoid costly, unnecessary options such as power windows, power locks, and air conditioners. These add weight, draw energy, and make vehicle operation more costly and polluting. Air conditioners can increase fuel consumption by 8 to 12 percent for highway driving and up to 25 percent for city stop and go. Worse, the CFCs used as refrigerants in air conditioners can escape through leaks or during servicing, contributing to ozone depletion.

- Instead of air conditioning, purchase a vehicle with tinted windows, and use the air vents. (See Fleet Driving re: air conditioner use).

- Select a manual transmission with overdrive or fifth gear to improve gas mileage at highway speeds. Manual transmission gives you up to 15 percent better fuel economy than automatic. It also gives your drivers greater control over the vehicle.

- Choose radial tires (few conventional bias-ply tires are now sold, in any case): properly inflated, they give you 4 to 8 percent better fuel economy. If you operate a fleet of trucks, purchase retreaded tires, which extend the life of a finite resource (petroleum-based rubber). (See "Purchasing" Chapter, for more information on the tire-retreading market for trucks. None, as yet, exists for cars.)

- Select electronic or computerized fuel injection: it provides quicker cold starts, smoother idle, and reduced emissions.

- In addition to the above tips, keep in mind that fuel efficiency in trucks is a function of weight, body type and style, aerodynamic drag, tire size and an engine/power train well suited to the job, climate and driving conditions.

- Ensure that your new trucks are equipped with wind deflectors and gap fillers, fairings and turning vanes to improve the aerodynamics of their shapes and reduce drag. These relatively inexpensive devices can improve fuel efficiency by seven percent.

Area: FLEET MAINTENANCE

Action: MAINTAIN FLEET FOR MAXIMUM FUEL EFFICIENCY

QS

A well-maintained vehicle uses less fuel and emits less air pollution than one that coughs and sputters.

- Tune up your vehicles' engines as often as specified in the owner's manual, changing sparkplugs, points, air filter as needed and doublechecking the functioning of distributor cap and wiring. A properly tuned engine can improve fuel efficiency by 10 to 15 percent.

- Have your vehicles' front-end alignment checked and corrected during engine tune-ups. Correct alignment reduces fuel consumption, and improves driving safety.

- Check tire pressure at least twice a month. Tires should be inflated to the maximum pressure specified by the manufacturer. Soft tires increase friction on the road, reducing mileage and wearing out the tire more quickly. Properly inflated tires can improve fuel efficiency by 5 percent.

- Modify your vehicles' engine-cooling systems: Installing an on/off fan clutch to keep the fan off when it is not needed reduces the demand on the engine. Installing radiator shutters or winterfronts (particularly on diesel engines) allows the engine to warm up more quickly.

Ten years ago there were virtually no alternatively powered vehicles on the road in Canada. By 1990 there were about 150,000 propane and 26,000 natural gas powered vehicles. This is still a relatively small fraction of Canadian vehicles but numbers are increasing. Most alternatively powered vehicles are fleet vehicles and taxis, which cover a lot of mileage.

Area: FLEET GARAGE

Action: OPERATE OR PATRONIZE AN ENVIRONMENTALLY SOUND GARAGE

QS

❑ Do not remove catalytic converters in order to improve performance or efficiency. Formerly retrofitted to automobile engines, they are now designed as an integral part of the powerplant and have a negligible effect on fuel efficiency. Current legislation requires catalytic converters for all on-road vehicles, including vans and trucks. They reduce emissions of hydrocarbons and carbon monoxide. Dual-bed catalytic converters also reduce nitrogen oxide emissions.

❑ Use re-refined motor oil. It's as good as virgin oil, it is about 10 percent cheaper (or should be — shop around), and it closes the recycling loop on an expensive and non-renewable resource by stimulating a demand for used motor oil. (See "Hazardous Materials" and "Purchasing" Chapters.)

❑ Use reusable oil filters. These stainless steel parts are designed to drain completely into used-oil containers (to go to the recycler from time to time), can be cleaned with soap and water (any contaminant is negligible), then reused indefinitely. They fit all cars and trucks, except diesels.

❑ Use water or non-toxic summer-grade windshield wash, which is made from water and detergent but contains no ethylene glycol, when there is no threat of freezing.

❑ When washing your fleet, try to conserve water quantity and quality. It's difficult to avoid flushing road salt and other contaminants down the drain, but at the very least use cleaning agents that are less harmful to the environment.

■ Use cold water to save energy.

■ Use low-phosphate detergents or soaps. (See "Purchasing" Chapter for definition.)

■ Use only as much water as you need. Don't leave the tap running when you are soaping the vehicles.

Servicing a fleet, whether in-house or at an outside garage, involves a number of hazardous materials and wastes, such as motor oils, transmission and brake fluids, anti-freeze and car batteries. In addition, vehicle maintenance puts workers in contact with potentially hazardous substances such as asbestos brake linings and vehicle exhaust.

When operating or choosing a garage, ensure that provincial/federal regulations for worker health and safety (see "Hazardous Materials" Chapter for information on Workplace Hazardous Materials Information System, WHMIS), are followed and that there is proper storage, handling, reuse and disposal of these vehicle-related hazardous substances. For the large user, there are exchanges and collection/treatment services for

QS

REQUEST "RE-REFINED"

In Canada, only 25 percent of the 425 million litres of used motor oil generated annually is re-refined for reuse because the entire motor-oil recycling loop — collection, re-refining capacity and market demand — is underdeveloped at present. The most effective way to remedy this situation and get that heavily contaminated hazardous oil out of storm

sewers, landfills and our water system is to increase demand for re-refined oil. Ask for it when you need oil. Individual consumer preference, and the procurement policies of governments, institutions, and businesses are the solution to this problem. ◀

In this decade, we could be driving an electric vehicle powered by aluminum and air, and capable of travelling 300 kilometres cleanly and inexpensively. Engineers at Alupower Canada Ltd. say the use of aluminum-air fuel cells will nearly quadruple the range of electric cars and make them a reasonable form of transportation, especially in metropolitan areas where pollution is high.⁷

QS

Area: FLEET DRIVING
Action: INSTITUTE FUEL-EFFICIENT DRIVING PRACTICES

hazardous substances, particularly used motor oil. For the small user, many municipalities and/or local garages provide collection services for recycling used motor oil and other materials.

The toxic substances involved in vehicle maintenance are covered in detail in the "Hazardous Materials" Chapter. Specifically, make sure your garage, or the one you do business with:

- ☐ Uses reusable oil filters (see "Fleet Maintenance").
- ☐ Uses re-refined motor oil.
- ☐ Safely collects and stores waste oil (in 45-gallon drums, if you do it yourself), and sends to a recycler.
- ☐ Has or uses equipment that recaptures for recycling CFC refrigerant during the repair of vehicle air conditioners, if any of your fleet is air conditioned. There are procedures and equipment to recover the refrigerant for reuse: Across Canada most domestic car-dealer service departments have switched to systems for collecting or recycling refrigerants. As of July 1, 1991, Ontario and Nova Scotia now require such systems in all automotive air-conditioning repair shops. Some car manufacturers have switched to a potentially less ozone-damaging refrigerant, HCFCs, as an interim step toward finding harmless substitutes.
- ☐ Follow good practice when using, storing or disposing of hazardous substances required for fleet maintenance; see "Proper Use, Storage and Disposal" in "Hazardous Materials" Chapter.

Fuel-wise driving can cut your overall fuel consumption by up to 10 percent. If your vehicles log 100,000 kilometres a year, good driving habits mean 10,000 of those are "free" — savings for you and the environment.

QS

- ☐ Train fleet drivers (and other employees) to:
 - Reduce speed. Cutting your highway-cruising speed from 110 km/hour to 90 km/hour saves 25 percent fuel.
 - Practise steady, moderate acceleration and smooth braking. Jerky starts and stops decrease fuel economy.
 - Turn the engine off. Idling accounts for 20 to 40 percent of fuel use in delivery vehicles.
 - If the vehicle has air conditioning, use only when travelling long distances and temperature is very hot.
- ☐ Open vents, not windows when travelling at highway speeds. Windows increase wind resistance, wasting up 2 percent of your fuel.
- ☐ If you operate delivery vehicles, practise daily-trip planning:
 - If you own several types of vehicle, select the most suitable and therefore most efficient for the job.
 - Remove unnecessary weight from the vehicle. For every 45 kilograms of extra weight, fuel consumption increases by 1 to 2 percent.

A bus carries the same number of people as 40 commuter automobiles, with 39 fewer exhaust pipes. Of course, bikes and sneakers can carry the same number with 40 fewer pipes.

- Make a pre-trip or delivery checklist to avoid doubling back for forgotten items.
- Consolidate deliveries.
- If a number of stops are required, plan the route to avoid doubling back and criss-crossing.
- Avoid peak areas and hours of traffic congestion, where possible. An average of 60 percent more fuel is used when driving in congested conditions as opposed to highway driving.*
- In winter especially, follow the above guidelines to minimize fuel waste. The extra strains on your vehicles of long warmups, idling and tire slippage can double the release of noxious emissions to the atmosphere. Other cold-weather tips:
 - Install a timer to start your block heater one to two hours before the vehicle is needed, rather than keeping it on all night.
 - If your parking lot has outlets for car block heaters, instruct employees to plug in their vehicles during the afternoon coffee break rather than leaving them plugged in all day. If feasible, put all vehicles on one timer, set to start an hour before the majority of employees depart.
 - Avoid excessive warmup time. Often, you need only to warm the engine for 30 seconds or so, then drive gently for the first few kilometres.
 - Remove all snow from your vehicle before starting out — moving extra weight burns more fuel.
 - Use electric defrosters only as long as required to do the job. Remember to turn them off.

Area: BUSINESS TRAVEL

Action: USE ALTERNATIVES TO CARS AND AIRPLANES

QS

On the basis of kilometres travelled per passenger, per litre of fuel, the airplane is the most inefficient form of travel, while the train is the most efficient.

- Before authorizing a business trip, consider whether the job can be done by telephone, conference call, fax or modem.
- Encourage employees to travel by bus or train when appropriate, for example, for shorter or overnight business trips.

Area: COURIER SERVICES

Action: USE NON-VEHICLE ALTERNATIVES

Ask yourself and your employees how urgent the delivery really is. Could it wait a few hours or even till tomorrow? When deadlines are being set, can a little extra time be allowed for delivery?

- For urgent or long-distance documents, use fax machines and electronic mail.
- For local or non-deadline documents, use bike or walk courier services. Don't forget the mail box either.

**Area: EMPLOYEE
TRANSPORTATION
TO AND FROM WORK**

**Action: ENCOURAGE
ALTERNATIVES TO ONE-
DRIVER CARS**

In most urban areas, the number of vehicles on the road exceeds capacity; not only does driving in congested traffic make your blood boil, it uses up to 60 percent more fuel than highway driving.*

We use our private, polluting automobiles more for getting to and from work than for any other reason.

Environmentally sound alternatives — public transit, bicycling, walking — improve employee health, and people who choose more dependable means of getting to work than private automobiles tend to miss fewer days of work.

Ride-sharing is also a practical solution in low-density residential and rural areas where public transit is not available.

☐ If you now provide free employee parking, consider revoking this privilege for single-occupant vehicles. Instead, offer employees a "bonus" not to drive. It could be equivalent to what you now pay per car for parking, or equal to the cost of a public transit pass. *Better yet, subsidize a public transit pass for everyone.*

Or, reduce parking rates for commuting vans and vehicles with a full passenger load and inflate rates for single-passenger vehicles. Weigh the costs of partially or fully subsidizing bus or train passes for employees — it may be cheaper than providing parking lots.

☐ Encourage ride-sharing and pooling. Set up a bulletin board or other communication system for hooking up those who wish to ride-share.

☐ Investigate providing van pools. For large companies, it could reduce the need to construct, expand and maintain parking lots and garages.

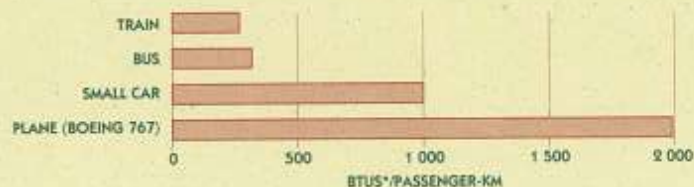
☐ Encourage employees to walk or bike. Provide secure bicycle parking, and change and shower rooms.

☐ If your organization has a number of locations around a city, offer employees the opportunity to transfer to a branch nearer to their home, making these alternative forms of travel more attractive.

☐ Urge your municipal government to create bike paths and lanes, and to provide efficient and cost-competitive public transportation.

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COMPARATIVE FUEL EFFICIENCY



* A British Thermal Unit (BTU) is the amount of energy necessary to raise the temperature of one pound of water one degree Fahrenheit.

Source: Preliminary Program, 17th Annual Conference of the Solar Energy Society of Canada, June 21-16, 1991, Toronto, Ontario ◀

SUCCESS STORIES

BIKES AND SHOWERS Bell Northern Research in Ottawa, Ontario encourages its employees to bicycle to work by providing bicycle lockup space and showers.

MORE THAN SCOTCH TAPE The 3-M Company of St. Paul/Minneapolis, Minnesota, provides 135 vans for employee transportation, carrying 1,500 commuters and saving 1.1 million litres of fuel a year.⁴

ETHANOL GAS Ethanol-blended gasoline for use in automobiles and light trucks was recently awarded Environment Canada's EcoLogo label.

Benefits: ethanol blends reduce dependence on fossil fuels and reduces both toxic and carbon dioxide emissions into the atmosphere.

FOOTNOTES

¹ *Transportation and Energy: An Action Guide for Groups*, by D. Creighton and I.S. Ancans, The Runge Press Ltd., Ottawa, August 1980.

² *1991 Aviation and Aerospace Directory of Canada; Canadian Civil Aircraft Registry*, Transport Canada, May 1991.

³ *The New Internationalist*, No.195, New Internationalist Publications Ltd., May 1989, pp.12-13.

⁴ *op. cit.*, D. Creighton and I.S. Ancans, 1980, p.5.

⁵ *Future Transportation Fuels: Conventional Fuels*, Ministry of Supply and Services, 1986.

⁶ *Globe & Mail*, May 29, 1990.

⁷ *Globe & Mail*, January 23, 1990.

⁸ *op. cit.*, D. Creighton and I.S. Ancans, 1980.

⁹ Personal communication, Peter Reilly-Roe, Department of Energy, Mines and Resources, August 13, 1991.

¹⁰ "Analysis of Origin/Destination Survey Hwy. 7 at McCowan Road in Markham," Transportation Demand Research Office survey, Ontario Ministry of Transportation, January 5, 1987.

SOURCES AND REFERENCES

The availability of information in both French and English varies depending on its source and purpose. References and publications are presented in the language in which they were provided.

FEDERAL

Public Affairs Branch
Transport Canada
Place de Ville, Tower C
330 Sparks St., 21st Floor
Ottawa, ON, K1A 0N5
(613) 990-2309

Publishes the *Fuel Consumption Guide*, which can be obtained, free of charge, by writing this department or from many car dealers or licence bureaus across the country. A list of other transportation related publications is also available on request.

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Department of Transportation
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PRINCE EDWARD ISLAND

Department of Transportation
& Public Works
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Charlottetown, PE, C1A 7N8
(902) 368-5500

NEWFOUNDLAND

Department of Works,
Services and Transportation
Confederation Building
P.O. Box 8700
St. John's, NF, A1B 4J6
(709) 576-3291

NATIONAL

Canadian Automobile Association
1775 Courtwood Crescent
Ottawa, ON, K2C 3J2
(613) 226-7631

Note: Also contact your provincial association.

Canadian Trucking Association
#300, 130 Albert Street
Ottawa, ON, K1P 5G4
(613) 236-9426

Note: Also contact your provincial trucking association.

PURCHASING

QUICK START What can you do, starting today, to improve purchasing practices and buy environmentally sound products?

Quick start provides easy-to-implement actions, providing excellent environmental benefits and potential cost savings:

QUICK START

FOR MORE INFORMATION

■ Purchase office paper with high, post-consumer recycled content.	Look for QS [symbol] on page 55, 93
■ Switch to cleaning products that are low-phosphate.	Look for QS on page 95
■ Use re-refined motor oil in vehicles.	Look for QS on page 100
■ Use mercury-free (or low mercury) batteries.	Look for QS on page 96
■ Purchase calcium magnesium acetate for de-icing sidewalks in winter.	Look for QS on page 99
■ Use organic herbicides, pesticides and fertilizers in grounds maintenance.	Look for QS on page 95

While you are developing a comprehensive environmental strategy and setting priorities for long-term goals, these Quick Start measures will help you get started. Implement as many of the target areas and actions as possible found in this Chapter.

IN ADDITION TO THE USUAL CONCERNS OF COST PER UNIT, DELIVERY TIME AND PRODUCT PERFORMANCE, PURCHASING AGENTS ARE FACED WITH A NEW CONCERN: TRYING TO IDENTIFY PRODUCTS WHICH ARE ENVIRONMENTALLY SOUND AND MADE OF RECYCLED MATERIAL. GRATEFULLY, THE GROWING DEMAND FOR THESE PRODUCTS HAS LED TO INCREASING AVAILABILITY AND QUALITY AND IMPROVING PRICES.

Harmony, Spring 1991, Vol. 1, No. 4

PURCHASING IN YOUR WORKPLACE



YOUR PURCHASING POLICY IS COSTING YOU AND THE ENVIRONMENT

The greatest fallacy of the modern-day workplace is that of the "paperless" office. Computers were supposed to revolutionize our working ways so that we could create, correct and communicate on-screen, shortcutting the alarmingly long, wasteful paper trail endemic to every organization. Instead, quite the opposite has happened: we create on computers, but we continue to correct and communicate on paper, generating even *more* drafts and copies than before because we can print them so lightning fast.

Far from being paperless, we are voracious consumers of this and other products in the workplace — from supplies such as printer and copier toner, cleaning materials, paints and de-icing compounds, to furniture and computer and photocopying equipment, to vehicles and motor oil, to building materials and appliances. A purchasing policy that is based only on supplying perceived demand is a costly one indeed. If your policy does not ask, in this order, whether you need to buy the product, which product alternative is best, and how most efficiently to use it, then you are purchasing unwisely — at the expense of your organization and the natural environment.

Every time your reports come off the photocopier on one side of 28 sheets of paper rather than two sides of 14 sheets, your paper bill doubles. Every time you buy disposable rather than rechargeable batteries, or buy batteries in the first place when AC current would suffice, you add more toxic waste to our landfills. Every time you purchase an energy-inefficient photocopier, or coffee-maker or other appliance or machine, you are inviting your local electric utility to raise your bill.

And every time you choose harmful products over their more benign alternatives, or over-use what you choose, you perpetuate a relentless cycle of resource depletion, energy abuse, pollution, and expensive "band-aid" solutions to cope with environmental problems that we all helped to create.

You can profit from a wiser purchasing policy in your workplace, particularly when combined with conscientious use and waste-reduction programs. So before instituting one, read the "Waste" and "Hazardous Materials" Chapters. Economically and environmentally sound buying begins not with "green" products, but with the 3Rs - reducing, reusing and recycling existing supplies and equipment. Then investigate the claims of "friendlier" products: Are they easy on the environment from "cradle to grave" — that is, from their development to their disposal? And are they cost-effective?

Think about establishing a purchasing group. By linking up with affiliated or like-minded organizations you can increase your environmental market power by encouraging suppliers to provide reduced packaging or seek less toxic products. But give your current suppliers fair notice of your new policy and the opportunity to switch along with you. Wiser purchasing decisions will have a ripple effect not only on your organization, but on the people who supply *your* products and services, the customers who use your products and services — and the forests, lands and waterways from which those products come and to which they return.

You can begin to reap and share these benefits by formulating, then implementing a workplace purchasing action plan.

YOUR PURCHASING ACTION PLAN

Read through the following Target Areas and Actions for improving your purchasing policy. Then find out how many you can apply to your own workplace by conducting an assessment of your products and purchasing practices throughout your operations. You can do this yourself, using the Purchasing Assessment Worksheet. If necessary, seek advice on your purchasing policy from a competent environmental consulting firm or environmental group, as well as associations you belong to.

Once you have assessed where and how you could improve your purchasing practices, record the areas needing attention and actions to be taken in the Action Planner. The Action Planner provides a plan tailored to your workplace. Some measures you'll want to implement right away, others will need further evaluation, but first create a "Workplace Green Team" of participants representing each part of your organization. (See "How to Use the Workplace Guide" Chapter.) There are lots of ways to coordinate this, but do involve staff and delegate. Assign a captain to every applicable Target Area and Action, and set dates for Green Team progress reports. To guide you in your purchases, use the results from your Purchasing Assessment Worksheet and the Purchasing Checklist.

Remember: preparation of your Purchasing Policy must work hand in hand with all the other environmental improvements being made in the workplace.

TARGET AREAS AND ACTIONS

Area: PAPER

Action: REDUCE USE

**REFER TO "WASTE" CHAPTER
FOR TIPS ON REDUCING AND
RECYCLING PAPER.**

- ☐ Purchase or lease a double-sided photocopier. Double-sided copying reduces paper consumption by up to 50 percent.
- ☐ Look for a photocopier with a by-pass paper tray that conveniently allows the use of one-sided blank paper for copying without unloading the main paper tray.
- ☐ Don't purchase "sticky notes" — they may seem convenient, but certainly aren't necessary (substitute a scrap of paper and a paper clip) and aren't accepted for recycling.
- ☐ Reduce the number of copies your organization produces of invoices (and the actual paper size of the invoice).
- ☐ Purchase computers with adequate hard disk space to store documents on the computer, not in paper files. See "Waste" Chapter for additional information on recycling and alternatives to paper communication.
- ☐ Negotiate a contract with a paper recycler for fine paper (as well as lower grades) throughout your workplace.

Area: PAPER
Action: PURCHASE
ENVIRONMENTALLY SOUND
PAPER PRODUCTS

If all the paper consumed in Canada yearly were recycled, 80 million trees would be saved, and about 35% of our municipal waste stream would be diverted.

Your organization can also make a big difference by choosing environmentally sound paper products, including a high percentage of recycled-fibre content and avoidance of chlorine-bleaching as a whitener. (Oxygen- or ozone-bleaching minimizes the hazardous toxins discharged in waste water by pulp and paper mills.)¹ To help you in your decision, Environment Canada's Environmental Choice Program (follows later in chapter) has established guidelines for paper products. In order to meet the EcoLogo program standards, all grades of fine paper (e.g. computer, bond and print-out) must contain at least 50 percent by weight of recycled paper, with a minimum 10-percent post-consumer fibre as of July 1991.

Unfortunately, the guidelines do not deal with chlorine bleaching. As well, paper manufacturers are already producing a variety of fine papers that substantially exceed EcoLogo standards (particularly in the important post-consumer content). And the absence of an EcoLogo on a product does not necessarily mean it is not up to these standards since application for an EcoLogo is voluntary and incurs a licensing fee for the manufacturer.

Much of the paper made from recycled fibre is of an equivalent quality to that made from virgin fibre. However, when switching to recycled-content paper, test its suitability and performance for the intended use, and ask your paper, photocopier and printing suppliers to assist you.

There is currently a cost premium for some recycled paper products. For example, a 500-sheet package of premier virgin-quality photocopier paper costs \$6.99, while the same package of 100-percent recycled-content costs roughly a dollar more. The premium is diminishing, and many industry experts say it will soon disappear.

- ☐ Adopt an environmentally sound paper policy. This includes:
 - implementing a 3Rs program for fine paper and lower grades of paper. (See "Waste" Chapter.)
 - purchasing recycled paper products (from stationery to file folders) that contain post-consumer fibre, the higher the percentage, the better. Good-quality papers are increasingly available with 100-percent post-consumer recycled content.
 - purchasing recycled paper that is unbleached, and non-deinked. This may not be indicated on product labels; ask your supplier to find out.
 - purchasing envelopes that, in addition to the above paper criteria, use water-based glue and have no plastic or cellophane windows.
 - purchasing address labels made with a recycled-paper backing sheet and water-based glue.
- ☐ Ask your paper supplier or printer to keep you advised about new papers and standards.
- ☐ Make purchases using the environmental criteria provided in the Purchasing Checklist.

QS

Area: ARCHIVAL PAPER

**Action: PURCHASE ACID-FREE
DOCUMENTS PAPER**

For documents to be included in your permanent hard-copy records, acid-free paper is your best choice. The very qualities that make it good archival material are also easy on the environment. It is produced using an alkali solution rather than an acid solution, so pulp-mill effluent is less toxic (acidic effluent liberates toxic metals from rocks in waterways). And because it does not contain acidic residues, it resists yellowing better than acid-produced paper.

In all other environmental respects, acid-free paper is not especially superior. It costs the same or slightly more than regular paper, but the price differential is disappearing as more Canadian companies switch their production capacity to the alkali process.

- ☐ Keep all appropriate records on computer disks.
- ☐ Encourage staff to edit documents on screen, producing only one, final copy for archives.
- ☐ Purchase acid-free paper for necessary hard-copy archives.

Area: SANITARY PAPER

**Action: REDUCE USE,
PURCHASE ENVIRONMENTALLY
SOUND SANITARY PAPER**

The recycled-fibre content of most of the sanitary paper products (hand towels, toilet paper) now available is high. A few brands contain 100-percent recycled content. Increased purchasing of 100-percent post-consumer recycled sanitary papers improves the market for waste office paper. And purchasing recycled-content paper of any kind means fewer trees cut, less energy used, less toxic effluent.

As well, there are a number of domestically produced 100-percent recycled fibre sanitary papers that are not chlorine bleached, which reduces the impact on the quality of our waterways. These are readily available through paper distributors, and as a rule are cheaper than other sanitary papers.

- ☐ Contract with a towel service to provide cloth-loop towel machines for washrooms (and specify that they be regularly maintained with clean supplies). If yours is a small office, simply provide a few towels for washrooms.
- ☐ Purchase sanitary papers that are made with 100-percent recycled content, a high percentage of post-consumer recycled fibre, and are not chlorine bleached.

**Area: PACKAGING
CONTAINERS**

**Action: PURCHASE REUSABLE
ALTERNATIVES, AND RECYCLE**

The majority of containers used in the workplace are probably those made from corrugated cardboard, which already contains a high percentage of recycled fibre. However, most corrugated cartons are designed for one-trip, one-time use, at which point they are disposed of or recycled. Your organization can minimize that waste by switching to reusable containers, and reusing your existing cardboard containers.

- ☐ Purchase, or rent for particular uses, reusable shipping containers (recycled plastic construction, steel, or wood) instead of corrugated cartons.
- ☐ Reuse or recycle any corrugated cardboard you receive when packing deliveries or purchases.
- ☐ Buy, perhaps in conjunction with neighbouring organizations a bailer to reduce used cardboard bulk for storage and transportation to a recycler.
- ☐ Locate a recycler. Depending on the state of the commodity market, your recycler will charge less than the local landfill tipping fee, pick up for free, or pay you for the used corrugated cardboard.

**Area: CLEANING PRODUCTS
AND DEVICES**

**Action: PURCHASE
ENVIRONMENTALLY SOUND
ALTERNATIVES**

Regardless of the size of your organization, you use cleaning products in the general upkeep of your workplace. These include all-purpose soaps, toilet and drain cleaners, window cleaners, floor wax and wax strippers, floor and furniture dusters and so on, all of which have varying degrees of impact on the environment (See "Hazardous Materials" Chapter).

You can help to minimize that impact by instructing your cleaning staff or cleaning contractor to switch to environmentally sound cleaning products (See "Hazardous Materials" Chapter). A definition of these terms, follows later in this chapter.

QS

☐ Specify low-phosphate cleaners that are citrus or plant-based, and non-hazardous. (See the "Hazardous Materials" Chapter for more detail on phosphates and alternatives.)

☐ Ask manufacturers or suppliers for material safety data sheets and reports of independent analysis of their products (there are no government guidelines to determine whether or not cleaning products are environmentally sound). Ask for specific information on *any* claim. If it's biodegradability, for example, find out how long it takes to break down and whether the by-products of degradation are harmful to the environment.

☐ Specify automatic dosing containers rather than manual or single-use packages; automatic dosing ensures that the minimum amount of product is used and reduces packaging waste. Where large refillable containers are available even more packaging waste is avoided.

☐ If refillable containers are not available, specify packaging that can be recycled in your community or ask the product supplier to take the containers back. Avoid aerosol spray cans. These cans can't be reused, or easily recycled.

☐ Specify concentrated cleaning materials where possible as the container will last longer (and can possibly be refilled).

**Area: GROUNDS-
MAINTENANCE**

**Action: ELIMINATE USE,
PURCHASE ENVIRONMENTALLY
SOUND ALTERNATIVES**

There are a number of approaches to grounds maintenance that avoid altogether the use of hazardous pesticides, herbicides and fertilizers, and that rely on organic alternatives. These techniques are infinitely preferred; for details on the environmental impacts of hazardous versus organic products, see "Hazardous Materials" Chapter. See "Water" and "Property Management" Chapters for information on watering lawns and gardens.

QS

☐ If you contract out grounds maintenance, select a landscaping service that offers an organic lawn-care program including aeration, top-dressing with compost, seeding, hand-weeding and application of organic fertilizers (only if necessary).

☐ Provide weed-diggers and a reward of five or 10 cents per dandelion (with root) to employees' children or neighbourhood kids. Or encourage the employees themselves as a spring/summer environmental project. Mechanical methods are more environmentally sound than chemical solutions.

Area: BATTERIES

**Action: REDUCE USE,
PURCHASE ENVIRONMENTALLY
SOUND BATTERIES**

Q5

If there are calculators, laptop computers, cellular phones, flashlights, cameras, smoke detectors, meters and gauges, and any number of other portable-powered equipment in your workplace, then there are dry-cell batteries too. Traditionally designed as disposables, they represent not only a waste of resources, but also a hazard to our ground water and soil when discarded. Their heavy-metal contents (predominantly mercury, as well as cadmium and zinc) can leach from landfill. At present, there are no facilities in Canada to recover and recycle them. Environment Canada estimates that batteries are responsible for 35 percent of the total release of mercury into the environment.

Before purchasing alternatives, plug into your workplace. Where could you be using AC current instead of batteries of any kind? Low or mercury-free batteries are better but your best choice is rechargeable batteries (which replace the need for 300 throw-aways before requiring replacement).

The Environmental Choice Program has established guidelines for non-rechargeable alkaline batteries. Cylindrical batteries, the major type, presently contain less than one-percent mercury. To meet the EcoLogo standards, batteries must be 99.975-percent mercury-free by weight. The required mercury-free percentage rises July 1, 1993 to 99.980 percent. Button batteries used in cameras, for example, must contain no more than 25 milligrams of mercury per cell.

- ☐ Purchase equipment and machines that do not require batteries, and choose AC current over batteries. Reorganize your workplace to make optimum use of outlets, or install outlets if there are an insufficient number.
- ☐ Purchase rechargeable batteries wherever possible; exceptions could include certain smoke detectors, as stated on label.
- ☐ If you purchase batteries choose mercury-free products which meet EcoLogo standards.
- ☐ Make purchases using the Purchasing Checklist criteria.

**Area: OFFICE EQUIPMENT AND
SUPPLIES**

**Action: PURCHASE
ENVIRONMENTALLY SOUND
FEATURES AND MATERIALS**

Your office equipment — computers, printers, photocopiers, document scanners, fax machines — consume energy, much of which is generated using nonrenewable resources, and all of which burdens the environment with pollution. In a typical office workplace, all this equipment draws about 15 percent of the total electricity, a figure estimated as high as 30 percent in highly automated offices, where there is intensive use of computerized and other electronic information-processing equipment.²

It's not just the operation of this equipment, but the supplies required — toner cartridges, ribbons, and reams of paper — that make a major environmental impact. Careful purchasing of office equipment can help to minimize that abuse, and cut your energy and other bills significantly.

Before buying more energy-efficient equipment, ensure that your employees are following wise practice with your existing equipment. Start with "turn it off" when not in use, and follow with the guidelines provided in "Energy" Chapter.

When in the market for new equipment:

- ☐ Think hard about your workplace needs before purchasing a high-speed photocopier: does its use really justify the extra energy a faster unit takes, or could you manage with a slower model?
- ☐ Purchase photocopiers with double-sided photocopying capacity to reduce your consumption of paper. Some photocopiers can be retrofitted.

- ❑ Purchase photocopiers with automatic paper-size selection to cut down on the number of wasted copies. (How many times has the person before you printed on legal-size, and you didn't notice, thinking it was letter-size?)
- ❑ Purchase photocopiers with "stand-by mode," which cuts the machine back to maintenance power when not in use after a set period of time, but keeps it "warm" so it quickly returns to full power when needed. On certain brands, stand-by is a standard feature. Others may offer a "power-saver" feature that automatically turns the machine off after a certain period of disuse.
- ❑ Purchase laptop computers where appropriate. Virtually all have AC plug-in capacity. They are more versatile than conventional PCs, and draw one-tenth the power for the same performance level.
- ❑ Purchase fax machines that use plain paper rather than thermal fax paper. The purchase price will be greater, but the operating cost will be less. Plain paper is reusable and recyclable, thermal fax paper is not.
- ❑ Purchase black-and-white computer screens unless you have a specific need for colour, which requires twice as much energy.
- ❑ Purchase dot-matrix printers — they draw one-sixth the power that laser printers require. Use for internal reports, labels or drafts. At about 300 dots per inch (dpi), the quality produced by laser printers is best used when only the highest-quality printing is required.
- ❑ Several companies now remanufacture laser-printer toner cartridges and reload dot-matrix printer ribbons. Make sure their use doesn't violate your warranty. If buying new laser printers, inquire about ones whose cartridge design enables remanufacturing. The Canadian General Standards Board (CGSB) has developed standards and runs a Certification Program for suppliers of remanufactured laser printer cartridges (see "Sources").

Area: PAINTS

**Action: PURCHASE
ENVIRONMENTALLY SOUND
PAINTS**

Most organizations contract painting and other maintenance tasks. Specify in your contract that the paints and their use be environmentally sound. Generally, water-soluble paints (which include latex and casein-based) are least damaging to the environment, releasing fewer volatile organic compounds into the atmosphere and requiring only soap and water for clean-up, not hazardous solvents. Oil-based, or "alkyd," paints release more toxic compounds, and require solvents for cleaning. Anywhere you can eliminate or reduce your use of oil-based paint, do so. (See "Hazardous Materials" Chapter.)

A number of water-soluble and oil-based paints have recently been awarded the EcoLogo, meaning they are not formulated or manufactured with formaldehyde or mercury or, in the case of oil-based, halogenated solvents; not tinted with lead, cadmium or chromium VI pigments; in the case of oil-based, contain *limited* amounts of volatile organic compounds and aromatic compounds; and conform to certain other environmental standards. The products are widely available.

Specify that your painting or building-maintenance contractors, or your own maintenance staff:

- ☐ Reduce paint use by carefully following instructions for application; avoiding spillage and waste; using all the paint in the container before disposing of the container; and consolidating leftovers for future use or disposal.
- ☐ Wherever suitable, purchase water-soluble paints. Look for products which meet EcoLogo standards and consider other sound environmental alternatives such as casein-based paints.
- ☐ Where oil-based paint is necessary, such as in bathrooms and other damp areas, purchase paint which meets EcoLogo standards.
- ☐ Follow good clean up procedures, especially when cleaning up after using oil-based paints. See "Proper Use, Storage and Disposal" in "Hazardous Materials" Chapter.
- ☐ Use up paints completely to minimize the amount requiring disposal. Paint that cannot be used can be given to someone who can.
- ☐ Proper Disposal:
 - air-dry water-based paint cans before disposal;
 - treat oil-based paints, rust paints, wood preservatives, stains and finishes as hazardous wastes and dispose of them at approved collection and treatment facilities. Many municipalities operate special depots or hold periodic hazardous-waste collection days.

Area: NEW CARPETING

**Action: PURCHASE
ENVIRONMENTALLY SOUND
CARPETING, REDUCE INDOOR-
AIR POLLUTION**

When carpeting is installed, its materials, foam backing and adhesives often emit toxic fumes. This "offgassing" phenomenon can pollute your workplace atmosphere with toxic contaminants such as formaldehyde, causing headaches, dizziness, nausea and drowsiness, among other unpleasant symptoms.

Before you purchase, ask yourself whether new carpeting is really necessary. If it is:

- ☐ Purchase carpets which are not latex bonded.
- ☐ Purchase wool carpets, a natural, long-lasting fibre.
- ☐ Specify rubber underpadding, not foam.
- ☐ Instruct the carpet installer that your first choice is to secure the carpeting with 'tackless strips,' instead of adhesives.
- ☐ If an adhesive is required: specify water-based adhesives and raise the temperature in your workplace to the maximum over the first weekend following installation to "bake-out" the air pollutants. Then thoroughly ventilate on an ongoing basis. (See "Sick Building Syndrome," in "Energy" Chapter.)

Area: DE-ICING COMPOUNDS

**Action: PURCHASE
ENVIRONMENT FRIENDLY
ALTERNATIVES**

Rock salt (NaCl) used on the sidewalks and roadways around your workplace contaminates ground and surface water, and soil, and harms vegetation. It corrodes the metal of vehicles, as well as damaging concrete and steel structures such as parking garages and bridges.

There are a number of alternatives whose manufacturers claim are less harmful to the environment including calcium chloride (CaCl₂); PM-20 (a mixture of NaCl and

Q5

$\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$); calcium magnesium acetate (CMA); sodium formate; urea; a mixture of water, magnesium chloride and PCl (sold as Freezgard + PCl); a mixture of rock salt, PCl and magnesium chloride (sold as Quicksalt + PCl); and a mixture of rock salt and sodium monofluorophosphate.

While most of these alternatives have not been fully tested and proven, (and they are more costly), CMA appears to be the most environmentally sound alternative and is less corrosive than rock salt.³

To keep your sidewalks and roadways clear:

- ☐ Purchase environmentally sound de-icing alternatives. Ask your suppliers to keep you abreast of the latest developments.
- ☐ Contract snow-removal services with a firm that uses less damaging materials than rock salt.
- ☐ At the very least, use salt sparingly and away from water.

**Area: FOOD SERVICE
APPLIANCES**

**Action: PURCHASE ENERGY
EFFICIENT EQUIPMENT AND
ENVIRONMENTALLY SOUND
PRODUCTS**

Stoves, refrigerators/water coolers, freezers, dishwashers, microwaves, toasters, kettles all consume energy during use — and if you have a food-service area in your organization, then you probably use all or some of these appliances.

Energy efficiency, therefore, is your major environmental consideration when purchasing new appliances. In addition, many refrigerators and freezers contain insulation manufactured with CFCs, a prime contributor to ozone-depletion. CFCs act as refrigerants in these appliances as well.

Environmental Choice has developed guidelines for large domestic (household) appliances based primarily on energy efficiency. And all household appliances, made in Canada or imported for sale here, display an Energuide label, which indicates energy consumption of each model. This label is not a symbol of approval indicating high efficiency, but a tool for comparing lowest to highest. However, appliances designed for commercial use (in restaurants, for example) are not covered, or labelled, under the Energuide program.

- ☐ When purchasing domestic appliances for use in your organization, use the Energuide label to direct you to the most efficient models. Ensure your choices meet EcoLogo standards.
- ☐ When purchasing any appliances, choose the most energy-efficient.
- ☐ Select durable, washable, reusable ceramic coffee mugs and dishes, and flatware, instead of one-use, throw-away polystyrene cups, paper plates and plastic utensils. Inform your caterer or coffee service.
- ☐ When servicing refrigerators and freezers, contract a service firm that recovers the CFC coolant for recycling rather than venting it to the atmosphere.
- ☐ Follow measures to reduce energy use in appliance. (See "Energy" Chapter.)

Area: LIGHTING

Action: PURCHASE LOW-ENERGY LONG-LASTING LIGHT BULBS, SWITCHES AND FIXTURES

- ☐ Purchase products recommended in "Energy" Chapter.
- emphasize energy conservation.

Area: WATER APPLIANCES

Action: PURCHASE WATER- SAVING ALTERNATIVES AND FEATURES

- ☐ Purchase products recommended in "Water" Chapter.
- emphasize water conservation.

Area: MOTOR OIL

Action: PURCHASE RE-REFINED MOTOR OIL

QS

Waste oils can be recycled. They are re-refined, or cleaned of their contaminants until they are as good as new, and used again as automotive, transmission and gear oils. That's a far more sensible use of a precious resource than sending it to landfill or down the drain, poisoning our waterways and soil with hazardous contaminants.

Environmental Choice has established guidelines for re-refined lubricating oils. To meet EcoLogo standards, lubricating oil must be manufactured using more than 50 percent by volume re-refined oil in the base stock, and the base stock must contain less than five parts per million (ppm) of chlorinated compounds and less than 25ppm metals with no one metal exceeding 5ppm.

Re-refined oils meet or exceed the automobile manufacturer's specifications for virgin crude oil — and they are cheaper.

- ☐ Reduce use of automobile/truck transportation; driving less reduces your use of all transportation products.
- ☐ Purchase re-refined motor and other lubricating oils, products which meet EcoLogo standards.
- ☐ Specify the use of re-refined motor oil in fleet maintenance contracts, or at the garage where your vehicle is serviced.
- ☐ Recycle used motor oil from your organization's vehicles if you service your own; or patronize only garages that recycle used oil.

Area: TIRES

Action: PURCHASE RADIALS FOR CARS, RADIALS AND RETREADS FOR TRUCKS

Dumping tires is a waste of a nonrenewable resource (most are made from petroleum-derived synthetic rubber). Piles of waste tires are a fire hazard, and when tires burn, they contaminate the atmosphere and ground water. Tire disposal problems have led to a purchase price surcharge/tax in some provinces.

If you own a fleet of trucks, your choice is between buying new radials or retreads of either radial or bias-ply tires. (Automobile-sized bias-ply tires are no longer marketed, though your large truck tires could well be bias-ply. These too can be recycled and retreaded.) Fully half the tires sold for trucks in Canada are retreads. The recycling-retreading market for truck tires is growing — and should be supported because it extends the life of a finite resource and consumes less energy in the production.

Approximately 25 million tires are discarded in Canada each year.

Area: VEHICLES

**Action: PURCHASE FUEL
EFFICIENT VEHICLES**

Area: FUEL

**Action: PURCHASE
ALTERNATIVE FUELS**

Unfortunately, things are not so progressive when it comes to buying car tires. Your choice is radial, because there is virtually no car-tire retreading taking place in Canada.

Retread tires are about 60 percent the cost of a new tire. In the U.S., retread tires meet federal safety standards and are said to provide similar mileage performance as new tires. In Canada, no standards have been set.

- ☐ Purchase radial tires for cars. At least you'll get 4 to 8 percent greater fuel efficiency than you did with bias-ply.
- ☐ Purchase retread tires for trucks, but ensure they satisfy safety regulations.
- ☐ For criteria for purchasing vehicles see "Transportation" Chapter.

Leading alternative fuels include natural gas, propane, ethanol, and methanol, and generally speaking, these burn cleaner than gasoline or diesel fuels. Of these alternatives, natural gas and propane are "cleanest" and most common, and provide the greatest environmental benefit. They release lower levels of hydrocarbons, which help form smog, and carbon dioxide, a major factor in global climate change.

Ethanol mixtures ("gasohol") burn cleaner than gasoline. Mixtures containing up to 10-percent ethanol can be used in conventional gasoline engines, and are readily available in B.C., Alberta, Saskatchewan, Manitoba and northern Ontario. Industry representatives say gasohol is likely to be available elsewhere in the country soon.

Natural gas or propane will give you cost savings of 40 to 50 percent, and they are widely available. (So far, Ontario is the only province to offer sales-tax rebates for converting to dual-fuel capacity.)

Another alternative fuel for limited uses such as in-plant and urban deliveries is the electric power cell. Electric-powered delivery vehicles provide some benefit to urban air-quality but incur the environmental impacts generally associated with the generation and use of electricity.

- ☐ Reduce use of your fleet vehicles — and reduce energy use.
- ☐ Take measures to improve efficiency. (See "Transportation" Chapter.)
- ☐ Convert fleet vehicles to natural gas or propane.
- ☐ Buy gasohol where available.

Area: FURNITURE

**Action: BUY DURABLES,
REPAIR OR DONATE**

Some foam cushions in furniture are made using CFCs and there is no way for purchasers to know. In general, it makes sense to buy durable furniture.

- ☐ While new foam-blowing agents are being developed to replace CFCs, choose higher density foams. They are better quality, last longer, and minimise use of CFCs.*

When furniture gets worn:

- ☐ Refinish wood surfaces and recover upholstery rather than replacing.
- ☐ If purchasing new furniture is in order, donate the old pieces to charity or to staff rather than sending them to landfill.

Area: PRINTING

**Action: CONTRACT
ENVIRONMENTALLY SOUND
PRINTING SERVICES**

When contracting for outside printing services, keep these environmental qualities in mind:

- ☐ ask for non-toxic inks, made from renewable resources, such as vegetable inks
- ☐ ask if used printing inks are recovered, cleaned and reused
- ☐ select recycled, non-chlorine-bleached, non-deinked paper stock
- ☐ have your documents printed on both sides of the page
- ☐ select recyclable or reusable report covers
- ☐ staple, don't glue reports or use plastic spines or binding
- ☐ specify reusable (preferably returnable) boxes or cartons for delivery of the printing to your office; and don't accept jobs that are shrink-wrapped

Area: PHOTO-DEVELOPING

**Action: PATRONIZE
ENVIRONMENTALLY
RESPONSIBLE PHOTO LABS**

- ☐ Patronize photo labs that recover their silver, and recycle their fixer and toner chemicals. (See "Hazardous Materials" Chapter.)

In North America, 2,935 "green" products were introduced during the first six months of 1989¹⁰, ranging from office papers made from 100% post-consumer recycled content to umbrellas with nature motifs.

ENVIRONMENTAL TERMS AND CLAIMS: WHAT DO THEY SIGNIFY?

RECYCLED: ♻️ this refers to the product's used-materials content. Look for a percentage figure, the higher the better. In the cases of paper and plastic, look for and give preference to a high percentage of "post-consumer" recycled content — this means that the reused material isn't mill ends swept up from the factory floor and put into the front end of the production process, but is material that was marketed, used, collected and recycled.

RECYCLABLE: ♻️ this means that the material or product is composed of or is capable of being recycled into the same or another product. This characteristic is generally signified by a three-arrow loop known as the mobius loop. Guiding principles for the use of environmental claims in labelling and advertising were developed within the context of the *Consumer Packaging and Labelling Act* and the *Competition Act* in May of 1991. Principles include: environmental claims and/or representations must be substantiated through credible information and/or test methods. Claims and/or representations should indicate whether they are related to the product or the packaging material. Development

of a definition for the term “recyclable” continues. It is expected that the definition will be structured around a minimum threshold value for availability, to the Canadian population, of recycling or collection facilities.³

BIODEGRADABLE: not a regulated term, and often misunderstood, biodegradable means that the product will break down into other substances when exposed to microbes in the environment. It is not necessarily a virtue because it depends on what is being broken down. For example, the banned pesticide DDT readily breaks down, but into similarly toxic and long-lasting substances. No gain to the environment.

It is a virtue in organic materials which, when composted, break down into humus — a valuable soil addition to improve conditions.

NON-TOXIC: this is a non-regulated and subjective term. Scientifically, toxicity is a continuum rather than a binary concept, meaning that substances are toxic to organisms in proportion to how much is ingested or absorbed, rather than being flatly “toxic” or “non-toxic.”

Nevertheless, non-toxic can be helpful as a starting point for purchasers to ask questions about what is or isn’t toxic in this product as opposed to its alternatives. Get details.

ENVIRONMENTALLY FRIENDLY: like the term “green,” this vague label is meaningless by itself. Consumer and Corporate Affairs Canada suggests in recent guidelines that these phrases be “made meaningful by providing specific product characteristics that set out the reason for the claimed benefit,” which is certainly good news for purchasers seeking environmentally sound products. Be wary too of euphemisms such as ozone and planet friendly.

LOW-PHOSPHATE: Low phosphate products vary in the amount of phosphate they contain and a clear standard does not exist. Any product in Canada, whose content is below 2.2 percent phosphorus (P) or 5 percent P_2O_5 , the maximum legal limit for phosphate content in laundry detergents, can claim to be low phosphate. Since phosphates can harm our lakes and streams (see sidebar on phosphates in “Hazardous Materials” Chapter) products with phosphate content with the lowest percentage are preferred.

ENVIRONMENTAL CHOICE PROGRAM

The Canadian Environmental Choice Program was launched in 1988 to help consumers identify products which ease the burden on the environment. The EcoLogo is the symbol of certification for goods and services which meet the product-specific guidelines. These guidelines study the product’s life-cycle (manufacture, transport, use or disposal) with a view to identifying aspects which offer opportunities to reduce negative impacts on the environment.

As of August 1991, eighteen categories of products and services had been established including:

- fine paper, made from recycled paper
- zinc-air batteries
- reduced pollution water-based paint
- reduced pollution solvent-based paint

- re-refined lubricating oil
- newsprint from recycled paper
- heat recovery ventilators
- ethanol-blended gasoline
- reusable cloth diapers
- insulation from recycled wood-based cellulose fibre
- products made from recycled plastic
- composting systems
- reusable shopping bags
- diaper services
- craft forms from recycled paper
- non-rechargeable batteries
- energy-efficient lamps
- water conserving products

Draft criteria have been prepared for seven products including:

- laundry and automatic dishwasher detergents
- energy-efficient major appliances
- sanitary paper from recycled paper
- compost
- products from scrap tires
- lead-acid batteries

The Canadian Standards Association is under contract with Environmental Choice to test products against the criteria and issue licences. Application for certification is voluntary; manufacturers, pay for the initial test (based on the size of their firms), and an annual fee to use the EcoLogo based on annual gross sales of the product.

A WORD ABOUT CHOOSING CONSULTING SERVICES

"Hanging out a shingle does not a competent environmental consultant make." With the growing demand for assistance in responding to environmental needs many public relations, marketing, legal, accounting and management firms are offering their services. However, as accreditation does not exist for environmental auditors, nor are there standards for such services, check references carefully to retain competent professionals.

A CHECKLIST FOR PURCHASING ENVIRONMENTALLY SOUND PRODUCTS AND SERVICES

How can you tell if a product or service is environmentally sound? The following checklist provides criteria to help you make good purchasing decisions. Satisfy as many of these criteria as possible for each product you purchase and ask for further improvements where required.

- ☐ The manufacture of this product favours renewable over non-renewable resources.
- ☐ The resources used in manufacturing this product do not come from areas suffering severe environmental degradation (e.g., lumber from tropical rainforests).
- ☐ The product is manufactured from (a high percentage of) recycled post-consumer waste.
- ☐ The manufacturing process is environmentally sound, causing minimum adverse environmental impacts or pollution.
- ☐ It is manufactured locally using resources from the closest possible source to reduce transportation requirements.
- ☐ It is shipped without packaging, or in reusable packaging.
- ☐ The product is made for longevity — it is durable and can be repaired.
- ☐ It can be used more than once, and it is easy to recycle when its useful life is finished.
- ☐ If it requires energy for use, it is efficient.
- ☐ When in use, this product does not harm the environment.
- ☐ If it must be disposed of (in your local landfill), it is environmentally safe.

Few products will meet all these criteria. Use these criteria to compare a number of products, and pick the one that satisfies the most criteria. Talk to your suppliers, shop around, ask for environmentally sound products and request continual updates on improvements.

When you purchase services, ask your service contractor to verify that the products and processes used in providing this service satisfy these same guidelines.

ESTABLISHING PURCHASING VERIFICATION PROCEDURES You will need to establish purchasing verification procedures for products that are (claimed to be) environmentally sound. The following form, used by the City of Toronto, Ontario serves as an example:

SEE NEXT PAGE

PRODUCT QUALITY VERIFICATION SHEET

It is the purchasing policy of *(your organization's name)* to give preference, where possible, to products which: a) meet the EcoLogo standards; b) contain recycled materials or products; and are environmentally sound.

In order to verify the quality content of your product/s, please complete the following form and return it with the bid documentation. Bids submitted without this completed form will not be accepted.

Bid Number: _____

Product: _____

Company Name: _____

Product Manufacturer: _____

Product Carries or Meets EcoLogo Standards - YES ☐ NO ☐

Product Recycled Material Content or Reason for Being Environmentally Sound: _____

Canada Environmental Choice Program Specifications that Product Conforms to: _____

Order may be subject to cancellation if information is incomplete or falsified.

Signature _____ Date _____

Position _____

Address: _____

Telephone:() _____ Fax:() _____

Credit: Association of Canadian Cities on Environmentally Sound Strategies (ACCESS), *Product Quality Verification Form*, adapted here from MM Dillon Ltd. Study, 1990, "Purchasing of Products Containing Post-Consumer Waste and/or Products which are Environmentally Sound."

SUCCESS STORIES

GREEN INK When Marc Leblanc read about ink made from canola oil, it sounded like a big improvement over the petroleum-based inks used at Supply and Services Canada's National Printing Bureau where Marc is foreman.

Marc spoke to his boss and got approval for a trial run. The result, this environment friendly ink is now used on 60% of the publications produced at the Bureau. Why?

- It's biodegradable;
- It goes further than its petroleum equivalent (one litre of the canola-based ink prints more pages than its petroleum counterpart);
- It doesn't rub off on your fingers;
- It is made from a grain, a renewable resource;
- It is easier to de-ink paper that has been printed with ink made from canola oil; when petroleum-based inks are used, a by-product of de-inking is a toxic sludge.⁶

GREENING THE HILL Parliament Hill is going green. Purchasing practices are being overhauled to make sure the business of the Hill is environmentally sound.

House of Commons procurement people are now looking for products that meet as many of the following criteria as possible:

- Reusable, or contains reusable parts
- Recyclable, or contains recycled material
- Produce fewer polluting by-products
- Make efficient use of resources and energy
- Have a long service life and/or can be economically repaired (as opposed to replaced)

In the case of service or maintenance contracts for House of Commons vehicles, successful bidders must demonstrate sound environmental practices such as using recycled oil, batteries and tires, and ensuring that all hazardous materials are properly disposed of.⁷

ONTARIO ANNOUNCES ENVIRONMENTAL PURCHASING POLICY A new purchasing policy was announced by the Province of Ontario in 1990. The purchasing policy promotes waste reduction, re-use and recycling, conservation and the development of environmentally-beneficial products and industries.

MUNICIPALITIES TAKE ACTION Many municipalities are taking action to incorporate environmentally sound products into their purchasing practices.

The City of Toronto has adopted a Principle on Environmentally Sound Purchasing "to provide for an expanded use of products and services that contain the maximum level of post-consumer reusable or recyclable waste and/or recyclable content, without significantly affecting the intended use of the product or service."⁸

In the Ottawa region, up to 30 municipalities and public agencies work collectively in order to purchase commodities which meet set environmental specifications. For example, 26 municipalities/agencies call co-operative tenders on fine papers, with a requirement that the paper product contain over 50 percent recycled content with a minimum of 5 percent post-consumer fibre.⁹ Co-operative purchasing has the financial benefits of lower price and good quality and helps develop markets for environmentally sound products.

FOOTNOTES

¹ *The Greenpeace Guide to Paper*, Renate Kroesa, Greenpeace Books, Cooper Clegg Ltd., 1990.

² "Office Equipment and Energy Efficiency," Ontario Hydro draft booklet, 1991.

³ *Purchasing Products Containing Post-Consumer Waste and/or Products Which are Environmentally Sound*, John Manuel and Lawrence D. Ludlow, M.M. Dillon Ltd., Toronto, 1990, p.74.

⁴ *Protecting the Ozone Layer. What You Can Do*, Environmental Defense Fund, New York, NY

⁵ *Guiding Principles for Environmental Labelling and Advertising*, Consumer and Corporate Affairs Canada, 1991

⁶ *Reporter*, Canada Communications Group, department newsletter, Department of Supply and Services, Ottawa, November/December 1989.

⁷ *Greening the Hill*, House of Commons Publication, June 1990.

⁸ *Statement of Principle on Environmentally Sound Purchasing*, Purchasing and Supply, City of Toronto, February 1990.

⁹ personal communication, R.P. Slattery, Director of Supply, City of Ottawa Supply Branch, August 21, 1991.

¹⁰ *Business Opportunities Arising From Changing Public Attitudes Towards the Environment*, Peat Marwick Stevenson & Kellogg, Vancouver, March 5, 1990.

SOURCES AND REFERENCES

The availability of information in both French and English varies depending on its source and purpose. References and publications are presented in the language in which they were provided.

NATIONAL

Purchasing Management Association of Canada
2 Carlton St., Suite 815
Toronto, ON, M5B 1J3
(416) 977-7111

PMAC represents more than 5,000 Canadian professional purchasers.

FEDERAL

The Secretary
Canadian General Standards Board
Department of Supply and Services
Ottawa, ON, K1A 1G6
(819) 994-5382

CGSB administers product-qualification listing programs to assist public and private-sector organizations in procuring goods and services. To make the list, service providers must demonstrate, for example, that their remanufacturing of laser printer cartridges meets the requirements of a CGSB standard. The CGSB currently has 175 Qualified Products Lists, referencing 200 manufacturers and 1,200 products.

Environmental Choice Program
107 Sparks St., 2nd Floor
Ottawa, ON, K1A 0H3
(613) 952-9440

The *EcoLogo* newsletter, available from *Environment Canada's Environmental Choice Program* certifies products, that ease the burden on the environment, with a symbol called the *EcoLogo*. These goods and services have met Environmental Choice product-specific criteria, based on a life-cycle approach. Re-refined motor oil, low-pollution water-based paints, fine paper from recycled paper and cellulose insulation are a few product categories. New additions are announced in the *EcoLogo*.

House of Commons
Ottawa, ON, K1A 0A6
(613) 995-1990

Provides a brochure called *Greening the Hill* which details specific actions being taken at Parliament Hill, to replace environmentally harmful products and methods with appropriate alternatives.

ONTARIO

City of Toronto
Department of Purchasing & Supply
City Hall, 18th Floor, West Tower
Toronto, ON, M5H 2N2.
(416) 392-7311

A *Directory of Environmentally Sound Products and Services* can be ordered. A listing of more than 400 manufacturers and suppliers in and outside Canada who sell such goods and services. Note: sellers provide information; not independently rated. \$50. Make cheques payable to City Treasurer. Mail to above address.



PROPERTY MANAGEMENT

QUICK START

What can you do, starting today, whether you are a tenant, building owner or property manager, to develop and implement improved property management practices and, where applicable, to establish cooperative tenant-property management programs?

Quick Start provides several easy-to-implement actions, providing excellent environmental benefits and potential cost savings.

QUICK START

FOR MORE INFORMATION

- | | |
|--|---|
| ■ Set up a tenant-management committee. | Look for QS [symbol] on page 113 |
| ■ Implement a waste reduction program. | Look for QS on page 115 |
| ■ Introduce on-site recycling. | Look for QS on pages 52, 117 |
| ■ Establish environmental criteria for renovations/construction. | Look for QS on pages 59, 117 |
| ■ Incorporate environmental principles in service contracts. | Look for QS on page 114 |
| ■ Apply environmental principles to grounds maintenance. | Look for QS on page 115 |

While you are developing a comprehensive environmental strategy and setting priorities for long-term goals, these Quick Start measures will help you get started. Implement as many of the target areas and actions found in this Chapter as possible.

P **ROPERTY MANAGEMENT AND YOUR WORKPLACE**



ADDRESSING SPECIFIC NEEDS OF TENANTS AND BUILDING MANAGERS

The principles and practices in this chapter are easily adapted to the needs of tenants in their own space, as part of a cooperative program, or a program developed by building management. The information should also prove helpful to organizations who wish to coordinate/standardize actions in their various workplaces.

We've also provided some helpful ideas specifically for property management, for tenants and for cooperative tenant-management programs.

TO PROPERTY MANAGEMENT

Property management provides excellent opportunities to support and initiate sound environmental practices in the workplace. More to the point, it can unify and strengthen the efforts of numerous workplaces, whether branches of a single organization or tenants in a building, shopping centre, business park or other complex, or schools in a board of education, into a cooperative of mutual goals. It is potentially much more cost-effective. This can happen in several ways:

- ☐ working amongst tenants to institute energy and water conservation, waste reduction and recycling; to avoid using hazardous materials where possible, to choose alternatives, and to follow good practices with those hazardous materials which can't yet be avoided;
- ☐ selecting service contractors and negotiating contracts for the provision of environmentally sound property services such as grounds maintenance, janitorial and cleaning, and cafeteria operation;
- ☐ renovating and/or building with consideration for energy and water conservation and efficiency, waste handling and the use of environmentally sound materials;
- ☐ purchasing water and energy-efficient equipment;
- ☐ managing in-house recycling programs;
- ☐ instituting higher parking rates as a disincentive to vehicle use, while creating or improving secure bicycle space;
- ☐ educating occupants to improve environmental performance;

- ☐ knowing the health, fire and hazardous-material regulations as they relate to recycling programs, hazardous-materials use, storage, and disposal, and more;
- ☐ organizing cooperative programs with others in your complex;
- ☐ coordinating efforts with other locations of your organization.

These opportunities will result in environmentally sound property management, often accompanied by real cost savings and greater efficiency.

TENANT-MANAGEMENT RELATIONS: A COOPERATIVE SPIRIT

If you manage a building with one, several or many tenants, taking environmental action will benefit from a cooperative effort.

As property manager, you may approach tenants first, or they might ask for changes. Either way, discuss improvements and how to deal with these common concerns together. All parties must understand the need for change; how the improvements will benefit the workplace — its occupants and owners — and the natural environment; and the specific steps for implementing the various measures.

Consult your tenants on options for improving environmental performance, what is required of them, any changes to rental/lease agreements or operating guidelines. For example, set targets for energy conservation: if energy consumption collectively drops by 10 percent, tenant payments can be reduced by a proportionate amount.

The formality of this consultation process depends on the number of your tenants and size of your operation.

A good time to negotiate environmental improvements, as well as sharing costs and benefits, is when you renew leases — but don't wait too long. Often changes can be easily adopted during an existing agreement.

Issues for consideration when developing a tenant-management strategy are generally those where tenant practices affect overall building management and where energy, water and waste-disposal and other costs are shared. Specifically, these include:

- energy use and consumption
- water use and consumption
- water discharge
- purchase of equipment (energy and water use)
- use, storage and disposal of hazardous materials
- collection and storage of materials for recycling

EDUCATING TENANTS

The success of implementing environmental improvements throughout your building or complex, rests on educating everyone: tenants and management staff.

The techniques outlined in the "Education and Training" Chapter, apply to educating tenants, staff and suppliers.

Working through your tenant-management environment

committee, or designated environment programs in each tenant workplace, it is important to deliver education and training to all participants.

It's in everyone's best interest for property management to support tenant programs to educate their staff.

You may want to coordinate activities in your building; for example, designate one month to implement energy-

TO TENANTS

As a tenant you want your workplace, the space you lease or rent as well as the entire building to be managed and operated in an environmentally sound fashion. You can take charge of the things you have direct control over; turning off the lights when you leave your work space to using paper with 100% post consumer recycled content. But what about the lights in the hall, the products used by the building cleaning staff, the pesticides used on the grounds of your building — these are the direct responsibility of your building owner and manager. However, because of their potential impact on the environment and on your workspace, they are your concern too.

Talk to the other tenants in your building and to the building owner and manager. Point out that environmentally sound building management is not only beneficial to the environment, but generally cost-effective and can ensure compliance with quickly changing regulations and community standards. For example, many cities now ban large loads of cardboard at landfills, putting the onus on generators to find alternatives to disposing of cardboard in the regular garbage.

Form a tenant-management environment committee to work cooperatively on ways to improve environmental practices in individual work spaces and in your building as a whole.

YOUR PROPERTY MANAGEMENT ACTION PLAN

The first step in identifying and implementing environmental improvements in your building is to survey current practices, those of building management, tenants and others who should be involved in your program... make this the responsibility of the Tenant-Management Environment Committee. Read through the Target Areas and Actions and decide how many you can apply to your own workplace or property. Use the Survey of Environmental Practices in Your Building, and the other Worksheets found in the Worksheets Chapter. The following are Worksheets that will help you assess property management in several key areas:

- Energy Assessment
- Water Assessment
- Hazardous Materials Assessment
- Waste Assessment
- Transportation Assessment
- Purchasing Assessment

Record the areas needing attention and actions to be taken in your Action Planner. The Action Planner, provides a strategic plan tailored to your workplace and building. Some measures you'll want to implement right away, others will need further evaluation.

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FORMING A TENANT-MANAGEMENT ENVIRONMENTAL COMMITTEE

If you manage a building with only a few or many tenants, and if you are a tenant ... forming an environment committee is an effective way to take action. Made up of tenant representatives and property management, the

CONT'D

conservation initiatives in all tenant space and the building/complex overall; next month, implement waste reduction and recycling programs. ◀

TARGET AREAS AND ACTIONS

SERVICE CONTRACTS

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As property manager, or as tenant, you want to know that those providing services in your building or office do so in an environmentally sound way. In some cases, this will also reduce costs. Service contracts, can specify the kind of products to be used and practices to be followed as agreed upon by your environmental committee. Give current contractor(s) the opportunity to provide the services and products you need, but if they don't within a reasonable period, choose reputable firms that provide the kind of environmentally responsible services you require.

Area: LIGHTING CONTRACT

Action: SPECIFY INCREASED EFFICIENCY

Specify in your contract that relamping include upgraded efficiency, or at least that your current lamps maintain optimal efficiency levels. For the most part, this will require replacing fluorescent tubes with high-efficiency ones (for example, replacing 40-watt lamps with 34-watt ones). This is usually a very cost-effective measure.

Also specify in your contract regular lamp cleaning to ensure maximum light output. For more on lighting measures to include in service contracts, see "Energy" Chapter.

Area: HVAC-MAINTENANCE CONTRACT

Action: SPECIFY REGULAR MAINTENANCE AND EFFICIENCY UPGRADES

A well-maintained HVAC (Heating-Ventilation-Air Conditioning) system is more efficient: burns less fuel, more cleanly.

A number of measures can be implemented to improve the efficiency and conservation of your system. (See "Energy" Chapter.)

Incorporate regular maintenance and efficiency upgrades in your HVAC maintenance/service contract.

Area: BUILDING MAINTENANCE CONTRACT

Action: SPECIFY ALTERNATIVE PRODUCTS AND MEASURES FOR PROPER DISPOSAL AND STORAGE OF ANY MATERIALS

Environmentally sound cleaning products, designed for use in commercial buildings, are increasingly available. Specify in your contract that:

- ☐ environmentally sound cleaning products be used
- ☐ hazardous substances are *not* to be discharged in water
- ☐ hazardous waste is neither to be incinerated, nor disposed of with the regular garbage
- ☐ the contractor follows good practice in the safe use, storage and disposal of hazardous materials.

For further details, see "Hazardous Materials" Chapter.

committee will assess overall practices in the building, as well as practices in each tenant workplace.

The building manager, will be responsible for implementing and monitoring improvements that apply to the property's overall management. Tenants will assume responsibility for motivating, educating and training their staff, and for helping to implement and monitor measures in their own workplace.

For efficiency's sake, the committee should appoint a chair to run the meetings, a secretary to record the discussion and decisions, a communications person to disseminate news throughout the building, and delegates to oversee and report the implementation of various initiatives.

To keep people informed and encourage participation, the committee should regularly communicate the progress of the

**Area: WASTE DISPOSAL
CONTRACT**

**Action: ARRANGE FOR
RECYCLING**

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Implementing waste-reduction and recycling programs, as well as measures to ensure that hazardous materials are kept out of the regular garbage, will require changes to your existing disposal contract.

- ☐ To satisfy all your new requirements, you may end up with several specialized contracts: one for paper-recycling, another to compost or remove food scraps from your cafeteria, another for hazardous materials, and finally, for "regular" garbage. The "Waste" Chapter, explains how to set up a recycling program and procedures for various types of waste.

**Area: GROUNDS
MAINTENANCE CONTRACT**

**Action: SPECIFY ALTERNATIVE
MAINTENANCE PRACTICES**

A number of measures can reduce or eliminate the need to use chemical herbicides and pesticides, and reduce the amount of water used in grounds maintenance. (See "Hazardous Materials" and "Water" Chapters.) Specify these measures in your contract with a grounds maintenance/service company and ensure that they include integrated pest management, an environmentally sound alternative.

**Area: NATURAL PEST
MANAGEMENT**

**Action: ADOPT NON-TOXIC
PRACTICES**

INTEGRATED PEST MANAGEMENT OUTSIDE Integrated Pest Management (IPM) is a more natural approach to grounds and garden maintenance based on the realization that healthy plants are less susceptible to disease and infestation and are best ensured by:

- ☐ choosing pest and disease-resistant seeds and stock
- ☐ growing varieties suited to your climate
- ☐ maintaining healthy soil
- ☐ rotating annuals

and through such techniques as:

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- ☐ companion planting - placing plants together with others which repel insect pests
- ☐ using predatory insects, such as ladybugs and parasitic insects
- ☐ microbial control, such as *Bacillus thuringiensis*
- ☐ encouraging insect-eating birds by providing feeders
- ☐ insect traps
- ☐ dormant oils for fruit trees
- ☐ natural insecticides derived from plants or diatomaceous earth (fossil flower)

joint environmental initiatives to everyone involved. Flyers on bulletin boards or in elevators, information sheets, and lobby and floor displays keep people up to date on plans and results. Set up suggestion boxes in strategic areas

welcoming all ideas and comments. Combined education and training also can be very useful and avoids duplication and confusion. ◀

Knowing your plants and the life cycle of their pests will go a long way to reducing or eliminating the need for harmful chemicals. For more information, contact Canadian Organic Growers, P.O. Box 6408, Station J, Ottawa, Ontario K2A 3Y6. Helpful papers that can be ordered from C.O.G. (\$3.00 each), are: RS 3/89 Non-toxic lawn care (4 pages) and RS 12/90 Chemical-free Care of Trees and Shrubs (8 pages).

NATURAL INDOOR PEST MANAGEMENT Indoor pest control is occasionally required, although good cleaning and waste handling practices and proper sanitation generally eliminate the need. When pest removal is necessary, recognize that substances toxic to pests often pose health problems to humans. These non-toxic methods are easy to use:

- ☐ for ants, sprinkle a dry mixture or solution of sugar (an attraction) and borax at the entry point.
- ☐ for cockroaches, plug holes of entry. Pyrethrin dusted in hiding places flushes roaches and diatomaceous earth (damages outer shell) or a roach ball made of 250 ml borax, 50 ml sugar, 50 ml chopped onion, 15 ml cornstarch and 15 ml water, will eliminate roaches.
- ☐ for silverfish, use a trap made of 1 part molasses, 2 parts vinegar in a shallow dish or treat areas with cucumber juice and diatomaceous earth.
- ☐ for mice, obtain a live trap and release in a woodlot. Get rid of the food sources which attract them in the first place.

Area: CAFETERIA OR FOOD SERVICES CONTRACT

Action: REDUCE WASTE

Waste reduction is a high priority in contracting out cafeteria operations. A reduction program should include:

- ☐ eliminating disposable cups, plates, cutlery and single-serving condiment packages
- ☐ encouraging patrons to bring their own coffee mugs and reduce waste generally
- ☐ collecting recyclables (aluminum, steel and glass containers)
- ☐ reducing and composting food waste
- ☐ using reusable cartons/containers in delivery of food products

THE ENVIRONMENTALLY SOUND WORKPLACE,

- *is energy wise*
- *is water smart*
- *reduces paper and other waste*
- *uses office paper with recycled, unbleached content*
- *avoids hazardous materials*

- *uses, stores and disposes of hazardous materials in the safest, most environmentally sound way*
- *encourages employees to walk, bike or bus to work, or to car-pool if driving is necessary.*
- *practices environmentally sound cleaning, pest management and grounds maintenance.* ◀

**Area: PURCHASING
SUPPLIES/EQUIPMENT/VEHICLES**

**Action: PURCHASE AND VERIFY
ENVIRONMENTALLY SOUND
PRODUCTS**

Supplies, equipment and vehicles are required in managing and operating a building.

- ☐ Specify environmentally sound products for your requirements when ordering.
- ☐ When the shipment arrives, verify that your requests have been met. (See Purchasing Guidelines and Product Verification Form in "Purchasing" Chapter.)

More on environmental purchasing considerations can be found throughout Workplace Guide. For example:

ACTIVITY	FOR INFORMATION
■ general purchasing guidelines	"Purchasing" Chapter
■ cleaning products	"Hazardous Materials" Chapter
■ grounds maintenance	"Water" Chapter "Hazardous Materials" Chapter
■ de-icing compounds	"Hazardous Materials" Chapter
■ office supplies/equipment	"Hazardous Materials" Chapter
■ HVAC equipment/controls	"Energy" Chapter
■ lighting	"Energy" Chapter "Hazardous Materials" Chapter
■ water fixtures	"Water" Chapter
■ vehicles	"Transportation" Chapter "Hazardous Materials" Chapter

Area: BUILDING/RENOVATING

**Action: PLAN BEFORE YOU
ACT. CONSIDER ALL ASPECTS
OF ENVIRONMENTALLY SOUND
PROPERTY MANAGEMENT**

QS

Making improvements to your building or constructing new space provides opportunities to also upgrade environmental performance.

- ☐ Ensure the building itself is well-insulated and air-tight, with (at least) double-glazed windows. (See "Energy" Chapter.)
- ☐ Lighting should include high-efficiency fluorescent lamps and luminaries, with state-of-the-art-controls. (See "Energy" Chapter.)
- ☐ Your HVAC system, upgraded or installed, should utilize (waste) heat recovery and exchange, and state-of-the-art equipment and controls. (See "Energy" Chapter.)

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MANAGING RECYCLING PROGRAMS IN MULTI-TENANT BUILDING

If you work in or manage a multi-tenant building, here are a few tips on initiating and running a recycling program.

- Coordinate the program among tenants, cleaning staff (for transferring recyclables from individual tenants to point of pick-up by recycling contractor), recycling contractor and building owner and manager.

- Discuss options for collecting recyclables from each tenant workplace and from common areas.
- Determine the collection method(s) best suited to your building and to your tenants' preferences.
- Educate all tenants and staff on what materials will be recycled and what procedures must be followed in

CONT'D

- ☐ Make provision for waste-reduction and recycling programs, in particular designing storage areas to accommodate recyclables and reuseables, from point of source to loading dock. (See "Waste" Chapter.)
- ☐ Install/or upgrade to highly efficient water-using fixtures: low-flow showerheads, low-flow toilets, and so on. (See "Water" Chapter.)
- ☐ Use building materials that are less harmful to the environment. Recognize that most new products and materials (for example, rugs and furniture), emit gases that may be harmful to human health; if possible, provide time for ventilating/exhausting new space before occupants move in and preferably choose alternatives. (See "Hazardous Materials" Chapters.)
- ☐ When you landscape a new building or upgrade existing grounds, look for alternatives to the well-manicured lawn to reduce your use of water and hazardous pesticides and herbicides. Plant indigenous shrubs and ground covers; use rock and wood. (See "Water" and "Hazardous Materials" Chapters.)
- ☐ Where there is renovation and construction, there is demolition and construction scrap. Increasingly, municipalities are refusing to take these wastes at landfills — these materials take up a lot of space *and* are still useful. Municipalities and private companies are providing alternatives: collecting and recycling used gypsum (drywall) to make new; chipping scrap wood for use in landscaping, and so on. The "Waste" Chapter can help you deal with these materials.

Area: PARKING

**Action: ENCOURAGE
ALTERNATIVES TO SINGLE-
RIDER CAR USE**

As an office building manager, you may provide parking for your tenants or employees and parking may be limited. Working with your Tenant-Management Environmental Committee, adopt the following methods to reduce car-use as much as possible:

- ☐ Provide preferred parking rates for commuting vehicles with full passenger loads.
- ☐ Encourage ride-sharing and pooling. Set up a communication system for assisting those who wish to ride-share.
- ☐ Investigate van pools. For large organizations, it could reduce the need to construct, expand and maintain parking lots and garages.
- ☐ Encourage employees to walk or bike. Provide secure bicycle parking, and change and shower rooms.
- ☐ Provide bicycle space in a secure area.
- ☐ Subsidize a public transit pass for everyone, the best choice.

collection. Prior to program launch and regularly thereafter, communicate with all building occupants.

■ *Seek assistance in setting up your program from your municipality, your provincial recycling council, local recycling contractors, and environmental groups.*

See "Waste" Chapter for detailed guidelines on setting up a recycling program. ◀

SUCCESS STORIES

CIBC DEVELOPMENT CORPORATION - BANKING ON GOOD ENVIRONMENTAL PRACTICES CIBC Development Corporation, a real estate subsidiary of CIBC manages office and commercial property across Canada. As part of their commitment to provide the highest quality services to tenants the company has introduced a comprehensive environmental program and a communication program to sustain it including:

- waste reduction - in multi-tenanted buildings, such as Commerce Court in Toronto
- fine paper recycling - in some 4 million square feet of office space. In its first year the program diverted more than 400 tonnes of waste paper from disposal
- old corrugated cardboard collected and baled - at 2 locations, combined with fine paper program has reduced CIBC Development Corporation's solid waste by 45 percent
- old newspaper - a pilot program is being expanded to all of Commerce Court, with a diversion target of 6 tonnes per month
- glass and cans - in conjunction with recycling in restaurants on site at Commerce Court, a pilot program was initiated and its success has led to a more comprehensive program diverting approximately 3 to 5 tonnes of glass and cans monthly
- wood pallets and skids - suppliers are encouraged to recover for reuse and wood waste from broken pallets is collected for recycling
- procurement - CIBC Development Corporation also has adopted a procurement policy which seeks to obtain environmentally sound products.

Although these initiatives largely occur in Toronto, recycling in Vancouver and Montreal properties are part of CIBC Development Corporation's commitment to a program expanding across Canada.

100,000 GREENER HOTEL GUESTS PER YEAR The Westin Hotel, Ottawa has 475 rooms, 100,000 guests per year, and 600 employees working in 28 departments. Working on site with Harmony Foundation the hotel has improved its waste management, conserves energy and water and has adopted environmentally sound purchasing policies and product use practices. Some changes include:

- recycling aluminum, tin cans, fine paper, glass, corrugated cardboard
- double-siding documents, consolidation of forms, increased use of telephone voice mail

RULES AND REGULATIONS

Check your local fire department regulations regarding storage of recyclables in your building, particularly for paper. Your municipal works department or local health unit can provide advice regarding composting on your building site. And, of course, obtain and follow the advice

of, your municipal and provincial environment officials on environmentally sound hazardous materials storage and disposal. Following these requirements is your responsibility. ◀

- reducing packaging on dry cleaning, reusing hangers
- installation of lower wattage light bulbs in high use areas
- "lights off policy"
- installation of toilet dams, efficient shower heads and reduced-flow faucets
- "wise water use policy"
- where possible, purchasing recycled papers, non-toxic cleaners and products in reduced packaging

Supported by Environment Canada's Partners Fund, this project was expanded to a national demonstration project including the Westin Bayshore in Vancouver and the Harbour Castle Westin in Toronto.

GREEN GOVERNMENT SERVICES Ontario's Ministry of Government Services has implemented a widespread environmental program which encompasses 5,000 buildings and affects 70,000 employees. To date, the Ministry has achieved 30 percent diversion of waste from landfill through recycling of fine paper, newspaper, cans and bottles and corrugated cardboard. Programs are being expanded to include polystyrene cups, wood skids and other surplus assets. The Ministry also plans to make a major effort at waste reduction by decreasing office paper use, exchanging throwaway cafeteria, and other, items for reusable ones, and by introducing composting.

FOR SOURCES Please see individual chapters mentioned.

E D U C A T I O N A N D T R A I N I N G I N T H E W O R K P L A C E



WHY ESTABLISH AN EDUCATION AND TRAINING PROGRAM?

There are some intriguing parallels between the natural environment and the workplace environment. Both are interdependent systems that function best when all elements of the system respect and support each other. The best environmental practices protect the health of employees and communities, save money, and help ensure that both our economy and our environment are sustainable. The best management practices acknowledge and support employees as part of the system, resulting in a high degree of worker satisfaction and productivity. They also recognize that good decisions respect the well-being of others beyond the organization.

Education and training are probably the most important elements for successful implementation of your organization's environmental program. Effective education and training helps everyone understand the purpose and benefits of the environmental program and specifically how they can incorporate environmental improvements into their area of responsibility.

Each organization is unique and has specific needs to establish an effective education and training program. This chapter will help you ensure that your education and training program is appropriate to your needs and effectively launches, maintains and reinforces your environmental efforts.

THE ELEMENTS OF AN EFFECTIVE PROGRAM

An effective education and training program increases awareness of environmental issues in general, encourages commitment to work toward solutions in your workplace, explains the reasons and benefits for implementing environmental improvements and for taking action, and builds the enthusiasm and momentum so important to the success of your organization's environmental strategy. It is necessary for all staff to understand the importance of making the strategy a priority and how it affects their day-to-day activities and those of persons working with them.

CREATE ENTHUSIASM AND MOTIVATE Encourage co-workers to actively participate in the program by submitting ideas and suggestions on improving environmental performance and joining the environment committee, or 'Green Team'. Provide opportunities, incentives and the time to participate. Share success by communicating the results.

PROVIDE ONGOING STAFF DEVELOPMENT AND TRAINING It is essential to provide ongoing training to ensure staff understand your environmental program and its goals. Changing habits isn't easy, so provide practical training, regular reminders and acknowledge a job well done. And it's important to also provide staff with the opportunity to continue to improve their skills through professional development programs.

ENCOURAGE FEEDBACK An important part of education and training is communicating results — employees need and want to see the benefits of their efforts. Regularly communicate the results of each and every aspect of your environment program in terms that are easy to understand — the amount of energy saved, the quantity of paper recycled, the number of trees spared as a result of your workplace paper-recycling program, new components of the program, and so on. Pride in accomplishment is a great motivator to encourage people to maintain and improve their efforts. Use an existing suggestion program or create a new one for environmental suggestions.

PROGRAM DELIVERY WHEN TO EDUCATE AND TRAIN?

Education must be ongoing. It begins on day one — and continues to keep staff up to date on achievements, changing information and new environmental priorities. The more co-workers understand, the more they get involved, the greater the success and satisfaction.

Education and training are especially important at key points in the process:

- beginning the assessment
- announcing assessment results/action plan
- implementing actions
- reporting results of improvements
- and ongoing — monitoring the program
 - introducing new initiatives
 - progress reports
 - reminders and improvements to program
 - for new employees

EMPLOYEE REWARDS

Thirty-three of Du Pont Canada's employees recently received their company's Environmental Respect Awards for their initiatives and efforts in:

- waste reduction
- product safety

- community outreach
- innovative technology.

Among the winners were employees who organized a waste-recycling program in the company's Kingston, Ontario facilities and a team that developed a hydrogen-peroxide bleaching process to replace the use of chlorine for the pulp industry.' ◀

WHO NEEDS EDUCATION AND TRAINING?

Everyone! The board of directors, all levels of management, sales people, plant and maintenance workers, secretaries, trainees, office clerks and new employees. For example:

- cleaning staff will need to learn new procedures for the use, storage and disposal of hazardous materials and their replacement with less harmful alternatives
- office staff will need to learn what goes in the fine paper recycling collection bins and what doesn't
- all staff will need to learn to turn off the lights and water when they are finished in an area
- office staff need to be reminded to turn off equipment at the end of the day, or when not in use
- everyone needs to be made aware of the commuting alternatives
- purchasing staff need to learn about your new environmental guidelines and procedures to verify that purchases/shipments meet the guidelines
- management needs to learn about corporate environment policies, managerial responsibilities and procedures for incorporating environmental considerations into decision-making, everyday responsibilities and into community outreach, and ways to support staff initiatives
- new employees need to be trained in your existing environmental programs and practices
- the board of directors also needs to be kept up to date on the success and problems of implementing the environmental program.

OTHERS TO GET INVOLVED

Don't forget to continually inform your various "publics" — others outside your organization who need to be involved:

- employees of service companies with whom you have contracts (e.g. painters, plumbers, etc.) — see "Property Management" Chapter
- contractors for supplies and services — see "Purchasing" Chapter
- customers and general public about your organization's environmental practices and policies — see "Environmental Excellence" Chapter.

WHO DELIVERS THE ENVIRONMENTAL EDUCATION AND TRAINING?

It is important that your environmental education and training efforts are coordinated with existing educational programs in your workplace. Be sure to coordinate with, and involve, knowledgeable staff and outside experts such as:

- your human resources and training staff, to organize your program and coordinate with other educational activities. Their role is especially important in training new employees
- your health and safety committee, to incorporate environmental education into their work

- the coordinator and members of your 'Green Team' — appropriate choices for conducting education and training
- your unions which often provide regular worker education and training programs into which environmental practices in the workplace can be incorporated
- your environmental champions — persons at all levels of your organization who are committed to environmental action — both at the workplace and in their personal lives. Encourage them to share information and experience with their fellow workers, to demonstrate composting and installation of water-saving showerheads, etc.
- outside experts such as reputable environmental consulting firms, environmental groups, industry representatives and government agencies (federal, provincial, regional and municipal). In addition to providing invaluable practical advice, they are especially good for senior management seminars and for kick-offs to environmental programs.

WHAT WILL BE INCLUDED IN YOUR EDUCATION AND TRAINING PROGRAM?

YOUR FIRST SESSION

The best way to start an education and training program is to arrange a special meeting. It highlights the importance of the program, as will the participation of senior management.

Start all education and training with a good overview of relevant environmental issues such as: ozone depletion, global climate change and waste disposal. Employees need to see the biosphere as an interrelated system to understand how their efforts contribute to global solutions. Discuss local problems and solutions. Be positive.

OPPORTUNITIES/PLACES TO LEARN

Where you do your education and training will depend on the nature of your workplace and staff duties.

When starting, consider a retreat — away from your workplace. Or organize an environmental activity such as a tree planting with a meeting to follow.

For staff in an administrative (office) workplace, scheduling of meetings may be relatively easy. For staff in operational roles, such as in manufacturing or a service industry, scheduling of special education and training may be difficult but can be done within existing staff meetings or events. Some initiatives will need specific training that is best imparted on the job. Ensure that sufficient, undisturbed time is allocated. *Demonstrate your commitment by compensating staff for overtime required.*

SOME EDUCATIONAL TOOLS

Make use of existing resources such as audio-visual presentations available from various sources. Other tools include:

- company newsletter (on recycled paper) or well-placed environmental noticeboards
- lunchtime session with outside environmental experts.

ACKNOWLEDGE, REWARD AND BE CONSISTENT

There are a number of ways to acknowledge the contribution of employees in meeting your organization's environmental objectives and to say "thanks!" for a job well done, as well as to motivate their continued participation. However, make sure that the way you say thank you is consistent with your environmental goals. Offering a prize for the best entry in a nature photo contest has little to do with environmental progress. A nature theme does not solve any environmental problems and photo processing can be environmentally damaging. Here are a few simple ideas:

- at social functions where gifts are given encourage those which don't harm the environment
- organize the annual picnic as a garbageless picnic (kick-off the composting or recycling program)
- give out or sell reusable coffee mugs
- report the successes of the program in environmental terms on a special bulletin board — for example, last week we saved 19 trees by recycling 1 tonne of paper
- incorporate an environmental component into your annual employee performance review and evaluation. Recognize employees who make an extra effort. They are your greatest asset
- donate savings resulting from your environmental program to an employee-chosen, environmental charity
- encourage and support employee involvement in environmental programs, community and national
- give employees time off to participate in environmental projects
- recognize employees who make a positive contribution to improving your environmental performance or who are involved in external activities for the environment; your organization's newsletter might carry a regular column featuring these environmental heroes, or you might use bulletin boards to feature the environmental champion of the month, complete with a short write-up on their contribution
- encourage staff to attend conferences on environmental issues and courses related to the environment.

WE LEARN BEST BY DOING

Although classroom-style lectures sometimes will be necessary, try as much as possible to make your education and training hands-on, relaxed and participatory. For example, once employees have been told about paper sorting for a fine-paper recycling program, have an employee demonstrate to the group which paper can and cannot be recycled.

Remember we learn best ...

- in a relaxed and cooperative setting
- undisturbed from the distractions of pagers and telephones
- voluntarily
- from a sense of pride and satisfaction
- when information is explained, not "told"

- when adequate time for questions is provided
- when it is fun and interesting
- by doing

SUMMARY: TEN STEPS FOR A SUCCESSFUL ENVIRONMENTAL EDUCATION & TRAINING PROGRAM

1. Appoint an environmental education coordinator as part of your Green Team.
2. Put up a notice on designated noticeboards about the environment program and update monthly.
3. Notify all employees about the environment program using methods which are environmentally sound such as a circular memo.
4. Organize a seminar for management on environmental issues. Where appropriate, involve an outside expert. Show video "Pulling Together." Call (519) 885-9426, Region of Waterloo, for information on the video.
5. Hold a general assembly with all employees including:
 - presentation by senior management
 - presentation by environmental coordinator, requesting volunteers for environment committee
 - show video "Pulling Together."
6. Make available for staff meetings, members of the Green Team to
 - provide updates on the program, answer questions
 - contribute to environmental decision-making.
7. Meet with departments to discuss their specific activities.
8. Hold monthly meetings of the environment committee to decide on priorities, activities and goals.
9. As required hold general assemblies to review the accomplishments and goals of the program. Present awards to departments with highest participation.
10. Ensure environment committee and senior management meet quarterly to review performance, set priorities and plan implementation of new programs.

CONSISTENCY COUNTS AT YOUR CONFERENCES TOO

When planning meetings or a conference, ensure that its planning and operation is environmentally sound. For example:

- Avoid the waste created by disposable cups, plates and utensils by arranging in advance with the caterer or cafeteria. Help educate others by requesting reusable service, even if they usually use disposables.
- Organizers at a waste reduction conference arranged with the hotel to have their left-over food composted instead of being thrown in the garbage. Now that's consistency!

- People are often encouraged to collect leaflets from displays. Often these are taken out of curiosity and end up in the garbage. Children especially like to collect "free" posters, reports or flyers. At an environmental conference, sponsored by a school board, an organization handed out plastic bags, encouraging students to take one of everything offered.
- A preferable arrangement is to set up displays without multiple copies of leaflets. At a professional activity day focusing on environmental issues, the Peterborough, Ontario County Board of Education had sample display copies of environmental education resources. Participants interested in receiving more information or copies of the resources, simply provided their address and telephone number.
- The promotional materials for your meeting or conference send an environmental message. To save paper, be as brief as possible, print double-sided on paper that can be recycled (i.e., not glossy), and that contains post consumer recycled fibre. It is also important to avoid duplications on mailing lists. An effective way of advertising your event without wasting paper is to send one notice to an organization and ask them to post it in a central location and include a note in their newsletter.
- Arrange for bins to collect paper, newspapers and beverage cans for recycling and encourage the composting of food waste.
- Choose a meeting location which is accessible by public transit or within walking distance of hotels. If not, arrange car pools or bus shuttles. Patronize hotels or centres which have an environmental program or will work with you to make your meeting or conference environmentally sound.

FOOTNOTES

¹ *ECO-LOG Week*, Vol. 18, No. 41, Corpus Information Services, Toronto, October 19, 1990.

SUPPORT FOR CHARITABLE AND NON-PROFIT ORGANIZATIONS IS VERY IMPORTANT TO THE SUCCESS OF CORPORATIONS AND THE WELL-BEING OF THE SOCIETY OF WHICH THEY ARE A PART. IT MAKES GOOD LONG-TERM BUSINESS SENSE TO INVEST IN THEIR EFFORTS.



*Martin Connell,
Chairman, IMAGINE Campaign*

E NVIRONMENTAL EXCELLENCE BEYOND THE WORKPLACE



You implement recycling and energy conservation programs where you work. That's a good beginning, but... a commitment to protecting and conserving the environment is more than a business opportunity or your response to regulations or public pressure. Environmental excellence extends beyond your operations and into the community in which you operate, whether it be a town, city, country or the global village. It goes beyond good public relations to a serious commitment to internal improvements and active involvement in and support for other essential environment programs.

ENVIRONMENTAL EXCELLENCE

Environmental excellence consists of a comprehensive approach including environmentally sound operations and an active leadership role in public and professional endeavours. It is demonstrated by:

1. your philanthropy and donations policy
2. your investments
3. honest public relations and your corporate environmental strategy
4. environmental leadership in your sector and working with industry and professional associations
5. good working relationships with and support for environmental groups
6. conducting and reporting environmental audits
7. sharing environmental information with your clients, customers, competitors and community
8. developing educational and environmental partnerships
9. supporting community environmental programs; encouraging employees to get involved
10. participating in community programs and activities on sustainable development
11. participating in multisectoral arrangements and working with government agencies to develop and upgrade standards.

CORPORATE PHILANTHROPY IS NOT ABOUT MARKET SHARE

In a world of mergers, downsizing and fierce competition, the donations budget of many organizations is diminishing. According to the Conference Board of Canada Canadian companies give less as a percentage of pre-tax earnings today than they did 20 years ago.¹ Consequently, the Canadian Centre for Philanthropy's Imagine campaign has found that the entire load of corporate donations is carried by 10 percent of all companies in Canada.

One argument in favour of diminishing donations is that there is no return on investment. Although environmental funding has increased, funds may be used to hire an environmental manager or to ensure regulatory compliance. Neither fulfills the responsibility for philanthropy.

At the same time sponsorship budgets are increasing at the rate of 15 percent each year.² Sometimes sponsorships are genuinely philanthropic and support good programs that offer long-term environmental benefits. Too often, though, the emphasis is on visibility, and such sponsorships are simply an extension of an aggressive marketing plan more concerned about profit and image than the environment.

Philanthropy is about generosity, community and benevolence *not* the bottom line. Concern for the environment is not another consumer fad; Canadians know that real environmental progress depends on serious action — and they expect it. Support for serious programs that provide long-lasting benefits will gain far more respect and loyalty for your organization, than green mugs and T-shirts at the local ecofair. Flashy events do not contribute to environmental progress. Unwanted giveaways are wasteful and leave you open to criticism. The most important criteria in choosing what to support, is lasting value for the environment, not visibility for the donor.

There are many excellent examples of corporate giving based on the principle of lasting value and which benefit local, national and international environmental programs. Here are a few good examples:

SUPPORTING LOCAL PROGRAMS

Patagonia, Inc. an outdoor clothing manufacturer based in Ventura, California has long been committing support to outspoken grassroots organizations. It gives 10 percent of pre-tax profits, or 1.2 percent of its gross sales, whichever is greater. When Patagonia of Canada, Inc. opened its doors in Vancouver in mid-1990, it followed the corporate mandate for an Earth tax. The Canadian office has given funds to a wide spectrum of groups including Temagami Wilderness Fund, Tatshenshini Wild, and the Alpine Club of Canada.

In 1990-91, Du Pont Canada donated 22 acres of wetlands on the Little Cataraqui Creek to the Cataraqui Region Conservation Authority in Kingston, Ontario.

SUPPORTING NATIONAL PROGRAMS

Since 1975, Xerox Canada has supported the Nature Conservancy of Canada in its efforts to purchase conservation areas across Canada.

IBM Canada supports environment-related education and research including that of Harmony Foundation, Public Focus, Trinity Theatre, the Canadian Environmental Network and three Canadian universities.

Global ReLeaf is a major program of Friends of the Earth to encourage Canadians to plant millions of trees to combat climate change. Partners develop an activity which supports Global ReLeaf. W.H. Smith, a national bookseller, donates an amount for each book sold. The Molson Companies sponsored a Comedy ReLeaf and donated radio announcements on the importance of community tree planting.

Support for environmental projects is not just from large organizations. In Ottawa, the Green Frog Nature Company markets wildlife theme T-shirts and sweatshirts and donates 10 percent of after-tax profits to environmental groups. In 1991, Green Frog will donate money to the World Wildlife Fund of Canada and the Canadian Nature Federation.

SUPPORTING INTERNATIONAL PROGRAMS

Royal Bank of Canada is a major sponsor of Harmony Foundation's Summer Institute for Environmental Values Education which brings together educators from across Canada and around the world to learn how to teach about the environment. Royal Bank, in collaboration with the World Wildlife Fund, the Smithsonian Institute and the University of Guyana, also is financing the establishment of a Centre for the Study of Biological Diversity in Georgetown, Guyana, to work on tropical-forest research and conservation.

FUNDS AND FOUNDATIONS

With growing frequency corporations, communities and others are establishing funds and foundations to provide support for community based environmental projects. These programs can provide valuable assistance for local activities, as do the funds listed below. However, there are inherent risks in the proliferation of such an approach including:

- reduced support for national and international programs...not everything can be done locally
- the "half a loaf" syndrome where small, often inadequate, amounts of money are scattered across many organizations rather than the money being allocated for maximum effectiveness
- valuable resources going to promote and administer the fund rather than directly supporting ongoing work of many good environmental organizations.

Examples of several existing funds and foundations include:

- Through a Canada Trust supported fund, customers donate a percentage of interest to support local environmental projects.
- Shell Canada launched the Shell Environmental Fund (SEF) in 1990 to provide funding to groups and individuals for community environmental projects across Canada.
- The Alberta Ecotrust is a cooperative environmental protection and conservation fund jointly managed by concerned corporations and environmental organizations created to provide funding for community environmental projects in Alberta.
- Environmental Partners Fund—an Environment Canada initiative to support national and community projects.

INVESTING FOR THE FUTURE

More and more investors are placing their investments and pension funds in socially and environmentally responsible corporations and funds.

Vancouver City Savings Credit Union, Canada's largest credit union, began offering investors The Ethical Growth Fund in 1986. The fund, the oldest of its kind in Canada, offers the opportunity to derive return on the equities of certain Canadian corporations that display ethical standards in environmental, health, and social justice issues.

Desjardins Trust, a Quebec financial institution launched an Environmental Mutual Fund in November 1990. Screening potential companies involves a three to six month process that includes a detailed questionnaire outlining each company's corporate environmental philosophy and action plan.³

AN IMAGE BASED ON SUBSTANCE: GIVING THE STRAIGHT GOODS ON GREEN PRODUCTS AND ACTIVITIES

The past few years have witnessed an explosion of green products and services, from lightbulbs, to cleaners, to office paper. In North America, nearly 3,000 new green products were introduced during the first half of 1989.⁴ During the same period, a growing number of companies also began to offer environmentally "friendly" services.

Business is clearly responding to consumer demands for products and services that have less of an impact on the environment and new companies are forming in response to these demands. **But a word of caution.** Avoid the pitfall of claiming more than you can deliver. Honesty in advertising and promotion is very important. You must demonstrate to your clients and community that your commitment to change is not simply because of new business opportunities. Promote the things you sell and do well, recognizing and acknowledging those that require improvement (rather than defending practices or products that are no longer acceptable to the public) — and make an ongoing effort to upgrade all the services and products you provide. Don't waste time attacking your competitors who are able to offer better products for the environment or who have made other environmental improvements — improve your own products and operations.

A GOOD POLICY LEADS TO ACTION

Your corporate policy is a vehicle for clarifying and stating your commitment to workplace operations that are environmentally sound. It provides a framework for decision making and taking positive action.

A good environmental policy provides a clear statement of principles, and is coupled with a strong commitment to specific action.

THE NINE COMMANDMENTS FOR AN ENVIRONMENTALLY RESPONSIBLE ORGANIZATION:

1. *Get the facts straight. When you market a product, service or improvement in your organization as "green", it will come under close scrutiny. For manufacturers — make a cradle-to-grave analysis of your product to ensure that*

every step in its manufacture, use and disposal is environmentally sound.

2. *Be honest in your advertising claims. Don't promise more than you are really delivering.*

3. *Don't use bafflelegab. Use clear, direct language.*

A MODEL ENVIRONMENTAL POLICY

We believe that a healthy environment is essential and we will strive to be exemplary in our environmental performance. The following principles demonstrate our commitment to plan and manage our operations to promote environmental protection in ways which meet the needs of the present without compromising those of the future. Our commitment is:

- to responsibly manage all aspects of our operations to ensure that recognized environmental standards and legal requirements are met and exceeded
- to give appropriate consideration to environmental concerns in management of our investments and assets
- to manage our internal operations to promote environmental protection in all feasible ways
- to work with industry, government and public groups to help determine economic and environmental priorities
- to participate in multi-sectoral programs to develop the standards and activities necessary to improve our environmental performance
- to provide support, through our program of corporate philanthropy, for selected non-profit groups doing sound and effective work for the environment
- to communicate with relevant stakeholder groups, in a timely and candid fashion, on the environmental aspects of our policies and operations
- to encourage all employees, throughout the organization, to be conscious of environmental considerations and be protective of the environment in their work and personal lives
- to conduct and make public an annual evaluation of our progress in implementing our environmental goals and policy.

Display your corporate environmental policy for customers and community to see. Invite comment and suggestion on how to further improve policy and practice.

THE VALDEZ PRINCIPLES

Another good choice was developed by the Coalition of Environmentally Responsible Economies (CERES), New York, NY, and the Environmental Action Foundation, Washington, DC, as a model environmental policy. This is a thorough and far-reaching policy. (The following adaption is from *The Corporate Ethics Monitor*, January 1990.)

4. *Be modest about your efforts. Your product alone won't save the world, and in all honesty, most efforts are at best a good first step.*

5. *Be frank in response to questions. When asked about a product, say what you do know and admit what you don't.*

6. *Don't assume you've solved an environmental problem — keep up with the issues. Excellence requires an ongoing effort.*

7. *Remember that old expectations die hard. Even if your product is truly green, consumers may still want whiter than white. Part of your education and advertising task is*

CONT'D

Companies that subscribe to **The Valdez Principles** pledge to address the following issues and actions:

- **Protection of the Biosphere:** minimize or eliminate the release of pollutants that damage the air, water or earth.
- **Sustainable Use of Natural Resources:** use renewable resources, conserve non-renewable natural resources, and preserve biological diversity.
- **Reduction and Disposal of Waste:** minimize the creation of, and safely dispose of, wastes, especially hazardous wastes.
- **Wise Use of Energy:** use environmentally safe, energy-efficient and sustainable energy sources in all operations.
- **Risk Reductions:** diminish environmental, health and safety risks to employees and host communities as well as prepare for accidents.
- **Marketing of Safe Products and Services:** sell products and services that are environmentally friendly, safe for consumers, and whose impact(s) are publicly known.
- **Damage Compensation:** accept responsibility for any harm the company does to the environment, restore damaged environments and compensate for human injury.
- **Disclosure of Environmental Incidents:** disclose accidents, incidents and hazards as well as protect employees who report them.
- **Environmental Directors and Managers:** appoint at least one environmental expert to the Board of Directors and another senior executive to manage environmental affairs.
- **Assessment and Annual Audit:** conduct and make an annual environmental audit of worldwide operations.

PARTNERSHIPS AND COOPERATION: SHARING INFORMATION

The environment is too important to be used as a competitive advantage. It's important to work with others in your community, industry and profession to improve environmental practices and share knowledge and expertise.

WORK WITH INDUSTRY AND PROFESSIONAL ASSOCIATIONS

- Realizing the environmental and financial benefits of going green, the Building Owners and Managers Association (BOMA) International is encouraging its members to practice the 3Rs. Using seminars and workshops, and providing guidelines, BOMA is pushing building owners and managers to launch reduce-reuse-recycle programs.⁵

to help consumers understand changes in product appearance and performance if it is to meet environmental criteria.

8. *Get other people involved, especially environmentalists.*

9. *Appoint an environmentalist, highly respected in your community, to your Board of Directors.*

[Adapted from: Peat Marwick Stevenson & Kellogg study: Business Opportunities Arising from Changing Public Attitudes Towards the Environment, March 1990] 4

- The Canadian Magazine Publishers Association recently announced measures that will act as a “blueprint for all magazines to follow on the road to environmentally conscious magazine production.” The industry is looking at ways to make magazines more readily recyclable, from paper stock and coatings to bindings.
- With 203 professionals representing hospitals, associations, suppliers, manufacturers, nursing homes and retailers in Ontario, the Health Care Environment Network has grown dramatically from its beginning as a 12-member group in April 1990. The network provides a forum for the exchange of information, ideas, and solutions in the pursuit of environmental responsibility in health care, covering such areas as waste reduction, disposable versus reusable diapers, hazardous waste, purchasing and packaging.

WORK WITH ENVIRONMENTALISTS

- Some environmental groups have come to realize the importance of developing a relationship with other organizations — even companies with poor environmental records — in an effort to work together to solve environmental problems and help change attitudes. Corporate appointees to the board of directors of an environmental group are not unusual; an act well worth reciprocating.
- Go to lunch with an environmentalist — that is, meet regularly with members of environmental groups. Invite them into your organization and discuss how to improve your environmental practices and how you can help each other.
- In August 1990, McDonald’s and the Washington-based Environmental Defense Fund (EDF) joined in a cooperative agreement. In exchange for helping McDonald’s develop environmental goals, the EDF got complete access to all McDonald’s records and activities, and full freedom to comment on the company’s environmental behaviour.*

INCORPORATE ENVIRONMENTAL AUDITS INTO YOUR ANNUAL FINANCIAL AUDIT AND REPORT

- Financial audits tell you and others about your economic performance and help you plan for the future. Environmental audits can similarly assist you to set short, medium and long-term goals, and evaluate your progress. Publicize this in your annual report and in your communications.
- Noranda Mines Inc. is a Canadian natural resource company that publishes an environmental report of its operations. The report is intended to help employees and shareholders better understand environmental issues for Noranda and the mining industry. It also includes Noranda’s compliance record and action underway to improve overall performance.
- The Canadian Institute of Chartered Accountants recently announced changes to accounting rules requiring companies to reflect future demolition or environmental cleanup costs when these would reduce recoverable assets below present book values. This is one step in true-cost accounting — an effort to reflect environmental and social costs in financial accounting.

SHARE ENVIRONMENTAL INFORMATION WITH YOUR CLIENTS, CUSTOMERS, COMPETITORS AND COMMUNITY ... A FEW GOOD EXAMPLES

- Pitney Bowes sponsored a 32-page booklet called *The Office Guide to Waste Reduction and Recycling* with the Recycling Council of Ontario. In keeping with the message of waste reduction, the booklet and an educational poster were sent only upon request.

For more information, refer to "Sources" in the "Waste" Chapter.

- The Westin Hotel, Ottawa shared information about the environmental improvements made in its operations with local hotels and with the Hotel Association of Canada.

PARTICIPATE IN COMMUNITY PROGRAMS ON ENVIRONMENT AND SUSTAINABLE DEVELOPMENT.

- An increasing number of municipalities have established Round Tables on the environment to enable government, private industry, conservation groups and individuals to work together on environmental issues. The first was established in Peterborough, Ontario in 1988, following "Our Common Future: A Canadian Response to the Challenge of Sustainable Development," a national forum organized by Harmony Foundation and hosted by the City of Peterborough and Trent University. The National Round Table on the Environment and the Economy has a publication to assist the formation of Municipal Round Tables.

PARTICIPATE IN MULTI-SECTORAL FORUMS AND WORK WITH GOVERNMENT AGENCIES TO DRAFT POLICY AND REGULATIONS FOR YOUR INDUSTRY.

- The Canadian Chemical Producers' Association, founded in 1962, has a membership of seventy-three companies producing a broad range of petrochemicals, inorganic chemicals and other specialty chemicals. The producers are working to develop and implement plans, programs and communications within industry and in conjunction with governments and regulatory agencies to promote the principles of "Responsible Care." Codes of practice have been developed to which the chief executive officer of each member company commits for production, storage, transport, use and disposal of their products.

GETTING INVOLVED IN YOUR COMMUNITY

There are many examples of organizations that participate in community projects and encourage their employees to get involved as well.

- For four years now, the North York General Hospital has had a Partners in Education agreement with Georges Vanier Secondary School in North York, Ontario. One of the activities is a "Naturalization Project", aimed at making the area around the hospital as natural as possible. The project involves patients, students, teachers and staff and 1,000 trees have been planted.
- This year, approximately 1,000 Black & McDonald Limited employees and their families contributed two hours of their time improving sites in various locations across Canada. One such project in Ottawa, was a major cleanup of an area which people had been using as a dump. A tree planting followed the cleanup, and the area is now slated to become a city park.

- The Body Shop is also dedicated to volunteerism. Each Body Shop in communities across Canada donates 16 hours of paid employee time every month to local charities.

CONCLUSION

The way in which you interact with your various publics tells much about your organization's personality and whether your initiatives are motivated by a sincere and strong commitment to solving environmental problems or more by self-interest. There is nothing wrong with saving money, making money or increasing public support through your environmental actions, but achieving environmental excellence and a reputation for outstanding performance will take a consistent effort throughout your operations and leadership in your external activities, too.

FOOTNOTES

¹ Ottawa Citizen, June 8, 1991

² Warner Canto Jr., American Express Travel related Services Co. Inc., at the "Presence Marketing," Financial Post Conference, March 26, 1991.

³ "Only the best are welcomed into the fold of Desjardins Environmental Fund" Investment Executive (Financial Post Publication), Cathy Collins, April 1991, p.8.

⁴ *Business Opportunities Arising from Changing Public Attitudes Towards the Environment*. Peat Marwick Stevenson & Kellogg. Vancouver, March 5, 1990.

⁵ *ECO-LOG Week*, Vol. 18, No. 43, Corpus Information Services. Toronto, November 2, 1990.

⁶ *Report on Business Magazine*, April 1991.

SOURCES

The availability of information in both French and English varies depending on its source and purpose. References and publications are presented in the language in which they were provided.

NATIONAL

The Canadian Centre for Philanthropy
74 Victoria St., Suite 920
Toronto, ON M5C 2A5
(416) 515-0764

The Centre's *Imagine* campaign encourages businesses and individuals to increase their charitable giving and volunteerism.

Canadian Environment Network
P.O. Box 1289, Station B
Ottawa, ON K1P 5R3
(613) 563-2078

The Canadian Environment Network, represents 2,000 environment organizations across Canada, and publishes *The Green List: A Guide to Canadian Environmental Organizations and Agencies*, a bilingual guide with 2,600 listings. May 1991. Send cheque or money for: \$50 (\$53.50 with GST); \$35 (\$37.45 with GST) for non-profit organizations, schools and libraries.

FEDERAL

Environmental Partners Fund
Environment Canada
107 Sparks St., 2nd Floor
Ottawa, ON K1A 0H3
(613) 952-9440

The Environmental Partners Fund is a government funding initiative that helps local and national groups to take action in protecting, preserving, enhancing and restoring the environment at the community level. For the nearest office in your province or territory, contact above address.

QUÉBEC

Centre de Formation en
Environnement Inc.
8106, Belle Rivière, C.P. 234
Sainte-Scholastique (Mirabel), PQ
J0N 1S0
(514) 258-2433

The Centre supports political decision makers and Québec administrators involved in researching practical and efficient solutions for the environment.



ASSESSMENT WORKSHEETS AND ACTION PLANNER

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ENERGY: ASSESSMENT WORKSHEET

Complete the following to profile energy consumption in your workplace and related environmental practices. Give priority to current procedures. Use periodically to compare results and determine progress.

The following Assessment overviews current practices and activities, helps to set goals and determine immediate actions. The Questionnaire examines overall consumption and cost, and practices in specific areas.

Energy Practices	Current Activities	Environmental Goals	Immediate Actions Recommended
improve heat loss by sealing air leaks			
improve heat loss by reducing conduction			
improve HVAC system energy efficiency			
upgrade HVAC with energy-efficient alternatives			
reduce lighting			
upgrade lighting with energy-efficient alternatives			
improve hot water system efficiency			
upgrade hot water systems with energy-efficient alternatives			
upgrade office equipment to improve energy-efficiency			
upgrade motors and machines to improve energy-efficiency			

REVIEWING YOUR ENERGY PRACTICES: A BRIEF QUESTIONNAIRE

1. YOUR OVERALL ENERGY USE AND COSTS

What is your annual energy consumption and cost by fuel type? Complete this chart.

	% energy use	amount (in kWh, m ³ , etc.)	actual cost
electricity			
natural gas			
oil			
other			
total	100%		

Note to tenants who don't pay energy bills directly. Use your percentage of total building space to estimate your energy consumption. If your space is 2,000 m² in a building totalling 20,000 m² (you occupy 10%), assume that your consumption is 10% of total building consumption.

2. SPECIFIC ENERGY USES

A typical commercial or institutional building uses energy as follows:

- lighting 40 to 60%
- HVAC 20 to 40%
- equipment 10 to 20%
- other 20 to 30%

Average figures will vary according to climate, type and age of building, occupant use and habits, etc. Determine your major uses:

	amount by use
lighting	
HVAC	
equipment	
other	
total	100%

3. PROFILES OF SPECIFIC AREAS OF ENERGY USE

A. PROFILE OF LIGHTING PRACTICES

1) Existing Lighting Use¹

For each area, inside and out, provide the following information:

Type of fixtures: _____ Number of fixtures: _____
If fluorescent, type of ballast and luminaire: _____ Lamp wattage: _____
Number of lamps per fixture: _____ Watts per fixture: _____ Total watts in area: _____
Lights are on: hours/day _____ days/year _____ Can lights be switched on and off as needed? _____
Is there an automatic timer and is it set properly? _____
Additional hours per day lights could be turned off? _____

2) Too Much, Too Little?

Workplace lighting is generally: adequate _____ under-lit _____ over-lit _____

Describe any deficiencies: _____

(Use a light meter to measure lighting levels at each work area and compare to desired lighting levels for each task.)

Are there special lighting requirements in your workplace for safety? _____ for security? _____

3) Responsibilities for Lighting Maintenance

Staff or contractor is responsible for the cleaning, maintenance and regular replacement of bulbs and fluorescent tubes (relamping)? _____

Are there guidelines or contractual requirements to improve and/or maintain the energy efficiency of your lighting system? _____

Maintenance and relamping provide opportunity to improve lighting efficiency and ensure all components are working properly.

B. PROFILE OF HVAC PRACTICES

1) Current Consumption

Estimate your energy use for HVAC:

fuel type: _____ cost/unit _____

volume/period: _____ / _____

total cost/period: \$ _____ / _____

2) Existing HVAC

(a) Central Heating Plant and System

Location: _____ Type of fuel used: _____ Type of system (e.g. hot water, steam,

warm air): _____ Number of zones: _____ Age of boiler or furnace: _____

Age of burner: _____ If you have a steam system, date steam traps were last checked: _____

Steam pressure of/or hot water temperature: _____ °C

(b) Type, condition of insulation: on boiler: _____

on air ducts or on distribution piping: _____ Is domestic hot water heated by the boiler? _____

(c) Efficiency Testing/Cleaning Adjustment

Date of last test/cleaning: _____ Results of test (e.g. combustion efficiency%): _____

(d) Air Conditioning

Number of units: _____ Make, type, size, location of each: _____

_____ Service Frequency: _____ Date of last service: _____

(e) Controls/Use

Location(s) and description(s) of thermostats: _____

Location of thermostats that might need to be locked: _____

Location of clock thermostat: _____

Cold weather temperature settings: _____°C When/how much thermostat is set back: night _____ weekend _____

Hot weather temperature setting: _____°C When/how much thermostat is set back: night _____ weekend _____

Hours/week system is used: in hot weather _____ in cold weather _____

Can system be turned down during cleaning hours? _____ When is system turned on/off in relation to daily occupancy (i.e., before, after, by how long)? _____ Are ducts or radiator adjustable? _____

Have they been adjusted to balance the system? _____

(f) Worker Comfort

Is your workplace...?

hot _____ cool _____ drafty _____ stuffy _____ dry _____ damp _____

(g) Responsibilities

Staff/contractor responsible for operating and maintaining your HVAC system: _____

Where maintenance is provided by an outside contractor, does the contract provide for the maintenance and improvement of system efficiency? _____

C. PROFILE OF THE EXISTING BUILDING ENVELOPE¹

1) For each outside area (e.g. front, rear, sides of building):

(a) Are there storm or thermal windows? Yes _____ No _____ Describe: _____

(b) Number/location of broken or cracked windows: _____

(c) Description of door or window repairs or replacements needed (including door closers): _____

- (d) Loading docks and garage doors in need of improved seals: _____
- (e) Does your building have warm or cold spots? Is it drafty near windows and doors? List the problem spots. _____

2) Inside

(a) Insulation

Location	Check if poorly insulated	Thickness	Present Insulation	Type
Ceiling				
Walls				
Floor				
Sills				

- (b) Location of drafts (use tissue, or smoke pencil, to locate): _____
- (c) Location of windows that need shades, blinds, reflective film: _____
- (d) Location of caulking and weather stripping to be repaired: _____

3) Responsibilities

Staff/contractor who performs this work: _____

D. PROFILE OF HOT WATER PRACTICES

1) Current Consumption

Estimate your energy use for hot water and enter here.

Energy consumption for hot water:

fuel type: _____ cost/unit: _____

volume/period: _____ / _____

total cost/period: \$ _____ / _____

2) Existing Hot Water System^a

(a) System Type and Age _____

Tank location: _____ Recovery Rate: _____

Type of energy: _____ Temperature Settings: _____ °C Storage capacity: _____

Insulation: tank _____ pipes _____

Location of electric booster-heaters: _____

(b) Hot Water Temperatures

At showerhead: ____ °C At dishwasher: ____ °C At faucet nearest tank: ____ °C At washing machine: ____ °C

(c) Showerheads, Faucets, Other

Showerheads Number: _____ Rate of flow: _____ (litres/minute) Average use: _____ (minutes/day)

Faucets Number: _____ Rate of flow: _____ (litres/minute)

Dishwasher Capacity: _____ (litres) Use: _____ (times/week)

Laundry Machine Capacity: _____ (litres) Use: _____ (times/week)

(d) Water Leaks

Location and description of each: _____

3) Responsibilities

Staff/contractor responsible for operating and maintaining your hot water system: _____

Guidelines for services provided by an outside contractor: _____

E. PROFILE OF MOTORS AND EQUIPMENT WHERE YOU WORK

1) Current Consumption

Estimate overall consumption by determining consumption per unit of time, for specific equipment, and multiplying by the time equipment is used for, a week or a month. Add up consumption for all your equipment:

Electrical: Energy consumption for motors and equipment

kWh of electricity/(period): _____ / _____

Costing (\$/period): \$ _____ / _____

Gas Powered: Gas consumption for motors and equipment

m³ of gas/period _____ / _____

Costing (\$/period): \$ _____ / _____

2) Existing Motors and Equipment⁵

(a) Elevators, Escalators and Motors (for each):

Turned off when possible? _____ or run continuously? _____ How old is the motor? _____

What is its efficiency rating? _____

(b) Air Compressors (for each):

Turned off when possible? _____ Location of leaks: _____

Is outside air used? _____

(c) Office Equipment (for each):

Turned off when not in use? _____

List any efficiency features: _____

(d) Cooking (for each piece of equipment):

Turned off when not in use? _____

Are lowest possible temperature settings used? _____

Is cooking done efficiently? _____

List any efficiency features: _____

(e) Washing and Drying:

Are machines fully loaded? _____ Are efficiency cycles (if present) used? _____

Do you use cold water detergents and cycles? _____ List any efficiency features: _____

(f) Refrigeration and Freezing:

Are optimum temperature settings used? _____ Are night covers used? _____

List any efficiency features: _____

Do you ensure that servicing prevents release of any refrigerants into the air? _____

3) Responsibilities

Staff/contractor responsible for maintaining and servicing equipment: _____

Do you have a corporate policy that addresses energy and the environment? If yes, summarize briefly. _____

Recommended Priority Action: _____

Completed By _____ Date _____

Approved By _____ Date _____

FOOTNOTES

¹ *How to Reduce Energy Costs In Your Building*, Victor C. Claman, TransAlta Utilities publication, Boston, 1984.

² *ibid*, Victor C. Claman, 1984.

³ *ibid*, Victor C. Claman, 1984.

⁴ *ibid*, Victor C. Claman, 1984.

⁵ *ibid*, Victor C. Claman, 1984.

HAZARDOUS MATERIALS: ASSESSMENT WORKSHEET

Complete the following to profile hazardous material use in your workplace and related environmental practices. Give priority to current procedures. Use periodically to compare results and determine progress.

The following Assessment overviews current practices and activities, helps to set goals and determine immediate actions. The Questionnaire examines overall consumption and cost, and practices in specific areas.

For each material, record quantity used each year. Annually compare both amount used and percent, split between hazardous and alternatives you switch to.

Area of Operation	Current Product Used	Environmental Qualities	Alternatives/Improvements Sought	Immediate Actions Recommended
BUILDING MAINTENANCE				
Paints				
Varnishes				
Stains				
Paint thinners				
Turpentine				
Solvents				
Paint stripper				
Wood preservatives				
Aerosol containers				
Fibreglass resins				
Epoxy resins				
Glues				
Window cleaners				
Rust removers				
Salt or other de-icers				
GROUNDS MAINTENANCE				
Pesticides				
Herbicides				
Fertilizers				
Pool chemicals				
TRANSPORTATION MAINTENANCE				
Car batteries				
Transmission fluid				
Antifreeze				

Area of Operation	Current Product Used	Environmental Qualities	Alternatives/Improvements Sought	Immediate Actions Recommended
Acids				
Engine coolant				
Motor oil				
Brake fluid				
Brake linings				
Tires				
Windshield washer fluid				
Freon (a/c)				
Degreasers				
Cleaners				
Fibreglass resins				
INTERIOR: BUILDING MATERIALS AND FURNISHINGS				
Insulation material				
Asbestos coatings				
Fire extinguishers, sprinkler systems				
Paints, varnishes, stains				
Floor covering				
Furniture				
Light fixtures, ballasts				
INTERIOR: OFFICE EQUIPMENT AND SUPPLIES				
Air conditioners				
Photocopiers				
Computer printers				
Air cleaners				
Photographic equipment				
Photographic chemicals				
Video display terminals				
Glue (solvents)				
White-out				

Area of Operation	Current Product Used	Environmental Qualities	Alternatives/Improvements Sought	Immediate Actions Recommended
CLEANING MATERIALS				
Aerosol containers				
Bleaches				
Carpet cleaners				
Detergents				
Disinfectants				
Drain cleaners				
Floor finishes				
Floor polishes				
Floor strippers				
General cleaners				
Lighter fluid				
Solvents				
Spot removers				
Toilet cleaners				
Waxes				
Window cleaners				

REVIEWING YOUR HAZARDOUS MATERIAL PRACTICES: A BRIEF QUESTIONNAIRE

Complete the following questions as best you can for the place where you work:

- How do you involve employees in the management of hazardous materials? _____

- Do you have a program to reduce your use of hazardous materials and to identify alternatives? _____

- Do you maintain an inventory of hazardous materials? _____

- Is safety information on containers? _____

- Are these materials WHMIS labelled? _____

6. Do you have designated and secure storage for hazardous materials? _____
7. Do you have a hazardous materials disposal contract? _____
8. Do you have a corporate policy on alternatives to hazardous materials? _____
9. Have you ever had a spill and not been sure of cleanup procedures and how to notify authorities? Describe. _____
10. When was the last time your ventilation system was checked? _____
11. Are you registered as a generator of hazardous waste? _____
12. If you have large quantities of hazardous waste, have you notified local authorities? _____
13. Do you have a corporate policy that addresses hazardous materials and the environment? If yes, summarize briefly. _____

Recommended Priority Action: _____

Completed By _____ Date _____

Approved By _____ Date _____

WASTE: ASSESSMENT WORKSHEET

Complete the following to profile waste generated in your workplace and related environmental practices. Give priority to current procedures. Use periodically to compare results and determine progress.

The following Assessment overviews current practices and activities, helps to set goals and determine immediate actions. The Questionnaire examines overall consumption and cost, and practices in specific areas.

Waste Type	Annual Waste (volume)	Percent Recycled/Reused	Waste Reduction Goals	Immediate Actions Recommended
Fine Paper				
Corrugated Cardboard				
Newsprint				
Other Paper				
Office Supplies				
Food Organics				
Aluminum				
Metal				
Glass				
Plastics				
Packaging				
Toner Cartridges				
Textiles				
Grease				
Motor Oil				
Batteries				
Tires				
Construction				
Pallets				
Other				
Other				

REVIEWING YOUR WASTE PRACTICES: A BRIEF QUESTIONNAIRE

1. Estimate the amount of garbage you produce in one year and the cost to haul it away:

volume/weight: _____ cost: _____

percentage increased over past year: cost _____ volume _____

percentage increased over past 5 years: cost _____ volume _____

If your business has a separate dumpster just for your garbage, ask your waste hauling contractor for volumes, weight and cost. If you are just one tenant in a multi-tenant building, ask your landlord about total volume, weights and cost for the entire building and estimate your share on the basis of the number of square meters of space you occupy compared to the total number of square meters of space in your building.

2. Name of your waste hauling contractor: _____

3. Destination of your garbage (landfill and/or incinerator): _____

4. Describe current 3Rs programs in your workplace: _____

5. Do you have a corporate policy that addresses waste and the environment? If yes, summarize briefly. _____

Recommended Priority Action: _____

Completed By _____ Date _____

Approved By _____ Date _____

WATER: ASSESSMENT WORKSHEET

Complete the following, to profile water conservation in your workplace and related environmental practices. Give priority to current procedures. Use periodically to compare results and determine progress.

The following Assessment overviews current practices and activities, helps to set goals and determine immediate actions. The Questionnaire examines overall consumption and cost, and practices in specific areas.

Water Practices	Current Activities	Environmental Goals	Immediate Actions Recommended
reduce employee personal water use			
reduce outdoor water use			
reduce kitchen and laundry water use			
protect water quality by not disposing of any hazardous materials down the drain			
protect water quality by using environmentally sound cleaning products			
conserve water used in production processes			
recycle/reuse grey water			

REVIEWING YOUR WATER CONSERVATION PRACTICES: A BRIEF QUESTIONNAIRE

1. Consumption: _____

Calculate your annual water consumption:

volume/year _____ cost/year _____

What is the single largest use? _____

2. Areas of Heaviest Use (list and guestimate use of each as a percentage of total): _____

3. Your Water Supply is From:

private well(s) _____ municipal supply _____ other _____

4. Rate Structure (check off the rate structure you are billed under and indicate pricing details):

flat rate _____ declining block rate _____ constant rate _____ increasing block rate _____

5. List all 'unusual' drains, those other than normal drains from sinks, etc. _____

6. List any substances which you put down the drain which you are not sure should go down the drain. _____

7. Describe any water conservation measures you have implemented recently: _____

8. Do you have a corporate policy that addresses water and the environment? If yes, summarize briefly. _____

Recommended Priority Action: _____

Completed By: _____ Date: _____

Approved By: _____ Date: _____

TRANSPORTATION: ASSESSMENT WORKSHEET

Complete the following, to profile transportation in your workplace and related environmental practices. Give priority to current procedures. Use periodically to compare results and determine progress.

The following Assessment overviews current practices and activities, helps to set goals and determine immediate actions. The Questionnaire examines overall consumption and cost, and practices in specific areas.

Transportation Practices	Current Activities	Environmental Goals	Immediate Actions Recommended
include energy-efficiency in purchasing			
emphasize fuel efficiency in fleet maintenance			
patronize an environmentally sound garage			
emphasize fuel efficient driving practices			
reduce business travel by using teleconferencing			
encourage employee carpooling or use of public transit			
use non-vehicle alternatives for courier services			

REVIEWING YOUR TRANSPORTATION PRACTICES: A BRIEF QUESTIONNAIRE

1. Number of vehicles in your fleet? _____
 - (a) cars _____
 - (b) trucks (distinguish by type) _____
2. Kilometres, in total, your fleet travels in one year? _____
3. Is fuel efficiency a factor in buying a new vehicle(s)? Describe how. _____

4. Is your maintenance program designed to optimize fuel savings? How? _____

5. Are drivers given guidelines and training on energy-wise driving? _____
6. Are used motor oils and other vehicle related hazardous materials properly stored, used and disposed? Explain. _____

CORPORATE TRAVEL

1. Are trains or other public transit used for local and medium-range travel? _____
2. Do you use teleconferencing to reduce travel? _____

COURIER/COMMUNICATIONS

1. Do you use electronic mail? _____
2. Do you use bike or walk couriers where possible? _____

PERSONNEL SUPPORT

1. Is there free or subsidized parking for employees? _____
2. Are employees encouraged to walk, bike, or take the bus? Describe how. _____

Do you have a corporate policy that addresses transportation and the environment? If yes, summarize briefly. _____

Recommended Priority Action: _____

Completed By _____ Date _____

Approved By _____ Date _____

PURCHASING: ASSESSMENT WORKSHEET

Complete the following to profile purchasing in your workplace and related environmental practices. Give priority to current procedures. Use periodically to compare results and determine progress.

The following Assessment overviews current practices and activities, helps to set goals and determine immediate actions. The Questionnaire examines overall consumption and cost, and practices in specific areas.

Product Type	Current Product Used; Environmental Qualities	Environmental Goals/Alternatives Sought	Alternatives Available	Immediate Actions Recommended
Office Paper (including computer paper)				
Sanitary Paper Products				
Cardboard -Packaging				
Fax paper				
Plastics -Packaging				
Packaging Fill				
Toner Cartridges				
Cleaning Products				
Herbicides and Pesticides				
Batteries (small cells)				
Vehicles				
Motor oil				
Tires				
Furniture				
Carpeting				
Lamps				
Photocopiers				
Computers				
Printers				
Appliances				
Paints				
Pens, Pencils and Markers				
De-Icing Compounds				

REVIEWING YOUR PURCHASING PRACTICES: A BRIEF QUESTIONNAIRE

1. What environmental considerations do you now incorporate in making purchasing decisions? _____

2. Do you have a purchasing policy and does it contain environmental considerations? _____
3. If you answered 'yes' to No. 1 or 2 above, what verification process do you follow to make sure the product(s) meets the supplier's/manufacturer's environmental claims? _____

4. Do you participate in a trade/industry association that coordinates efforts on behalf of its members to promote environmentally sound products and purchasing practices? _____

5. Do you involve suppliers/dealers in any environmental initiatives? How? _____

6. Where in your organization is responsibility for purchasing located? Is it centralized? _____

7. Do you have a corporate policy that addresses purchasing and the environment? If yes, summarize briefly. _____

Recommended Priority Action: _____

Completed By _____ Date _____
Approved By _____ Date _____

SURVEY OF ENVIRONMENTAL PRACTICES IN YOUR BUILDING

The following survey of environmental practices in your building/organization will enable you to determine the support for environmental improvements and cooperative activities. Use periodically to compare results and determine progress.

The following Assessment overviews current practices and activities, helps to set goals and determine immediate actions. The Questionnaire examines overall consumption and cost, and practices in specific areas.

SURVEY OF ENVIRONMENTAL PRACTICES IN OUR BUILDING/ORGANIZATION

Please complete the following survey and help us determine environmental activities in place and the opportunities for cooperative programs. Give priority to current practices and procedures unless otherwise indicated. Please return to:

contact name _____

organization _____

address _____

telephone number _____

Indicate the environmental programs underway in your workplace:

1. TENANT SPACE SURVEY

	Yes	No	Planned/Desired	Would Participate in Cooperative Program
<i>Have you taken any measures to reduce your waste?</i>				
Do you recycle fine paper?				
computer paper?				
newsprint?				
aluminum?				
glass?				
plastics?				
other?				
<i>Have you taken any measures to reduce your water consumption?</i>				
Do you have ultra-low flush toilets in your building?				
toilet dams?				
sink faucet aerators?				
water efficient showerheads?				
automatic shut-off taps?				
mixing or tempering valves?				

	Yes	No	Planned/Desired	Would Participate in Cooperative Program
<i>Have you taken measures to curb your energy consumption?</i>				
Do you shut off equipment when it is not in use?				
Only run equipment when at full capacity (e.g. washing machine)?				
Keep heating and cooling temperatures moderate?				
<i>Have you taken any measures to reduce the amount of hazardous materials you use and/or replace them with materials that are safer for the environment and human health?</i>				
Do you recover, reuse, or sell any hazardous materials you use?				
Securely store any hazardous materials?				
Have an emergency plan that instructs staff about how to respond to accidents involving hazardous materials?				
Have you introduced more environmentally sound alternatives where possible?				
<i>Have you taken measures to improve your vehicle efficiency?</i>				
Do you purchase fuel efficient vehicles?				
Keep your vehicles well maintained?				
Train staff in energy-efficient driving techniques?				
Use bicycle couriers as much as possible?				
Encourage your staff to walk, bike, bus or car pool to work?				

	Yes	No	Planned/Desired	Would Participate in Cooperative Program
<i>Have you revised your purchasing policy to emphasize efficiently used resources and environmentally sound products?</i>				
Do you set out environmental guidelines for suppliers?				
Purchase energy efficient equipment?				
Buy products with minimum packaging?				
Buy products that are durable and repairable?				
Buy recycled materials (e.g. post consumer recycled paper?)				

2. SURVEY OF GENERAL BUILDING MANAGEMENT PRACTICES

	Yes	No	Planned/Desired	Would Participate in Cooperative Program
Do building cleaners use environmentally sound products?				
Do building lighting contractors upgrade and maintain efficiency?				
Do landscape contractors use environmentally sound products and practices in maintaining the grounds?				
Are alternatives to salt used to de-ice sidewalks and parking areas?				
Are there building-wide 3Rs (reduce, reuse, recycle) programs?				
Are building energy systems efficient and maintained?				

3. INTEREST IN COOPERATIVE PROGRAMS. WOULD YOU PARTICIPATE IN A JOINT TENANT-PROPERTY MANAGEMENT COMMITTEE TO PLAN AND IMPLEMENT IMPROVED ENVIRONMENTAL PRACTICES?

Yes ☐ No ☐

What priority actions/programs would you suggest?

List any suggestions you have for ways and areas in which we can work together to improve environmental practices in this building/organization/complex. _____

ENVIRONMENTAL ACTION PLANNER

ACTIONS TAKEN (LIST MEASURES YOU HAVE IMPLEMENTED)

Actions Taken

Date

TARGET AREA:

Progress Report/Comments

Who's Job?

ITEMS FOR REVIEW (LIST MEASURES YOU WISH TO EVALUATE FURTHER)

Action

Who's Job?

Progress Report
(Due Date)

Comments

Completed By

Date

Approved By

Date

ACTION REQUIRED (LIST MEASURES YOU HAVE SELECTED-MEASURES YOU WOULD BENEFIT FROM DOING)

Action

Who's Job?

How to implement/when

	Progress Report	Other Comments
	(Due Date)	

Other Comments

Completed By _____

Date _____

Approved By

Date _____

A FEW MORE SOURCES AND REFERENCES

The availability of information in both French and English varies depending on its source and purpose. References and publications are presented in the language in which they were provided.

The materials and sources listed below provide further details for planning workplace environmental improvements and valuable information for raising the level of environmental awareness of all staff.

GENERAL ENVIRONMENTAL INFORMATION

BOOKS, REPORTS

Achieving Environmental Excellence. Focus 2000, The Canadian Chamber of Commerce, 55 Metcalfe St., Suite 1160, Ottawa, ON K1P 6N4. (613) 238-4000, fax (613) 238-7643. (The Chamber of Commerce represents more than 150,000 businesses of all sizes across Canada.)

Business and the Environment. A handbook of industrial ecology with 22 checklists for practical use. Georg Winter. McGraw-Hill Book Company GmbH. Toronto and Montreal. 1988.

Blueprint for a Green Economy. David Pearce, Anil Markandya, Edward B. Barbier. Earthscan Publications Ltd. London, England. 1989.

The Environmental Imperative, Market Approaches to the Greening of Canada. Edited by G. Bruce Doern. C.D. Howe Institute. Toronto and Calgary. 1990.

Getting It Green, Case Studies in Canadian Environmental Regulation. Edited by G. Bruce Doern. C.D. Howe Institute. Toronto and Calgary. 1990.

Greening the Hill. A comprehensive program, involving five buildings in the House of Commons complex and the working environment of more than 3,500 people, designed to replace

environmentally harmful products and methods with appropriate alternatives. House of Commons, Ottawa, ON K1A 0A6.

Our Common Future. The World Commission on Environment and Development. Oxford University Press. Toronto. 1988.

Sustainable Development, A Policy Paper. Canadian Manufacturers' Association, 130 Albert St., Suite 302, Ottawa, ON K1P 5G4 (613) 233-8423; fax (613) 233-6048.

CONFERENCE PROCEEDINGS

Environmental Auditing Symposium: Challenge of the 1990s. Calgary, February 27-28, 1990, and Ottawa, May 29-30, 1990. The Banff Centre for Management, Box 1020, Banff, AB T0L 0C0 (403) 762-6327; fax (403) 762-6422.

Our Environment, Solutions for Business from Business. Financial Post Conferences with the assistance of Harmony Foundation, Royal Bank, and City of Ottawa. June 7 & 8, 1990. Westin Hotel, Ottawa. Financial Post Conferences, 3rd Floor, 333 King St. E., Toronto, ON M5A 4N2 (416) 350-6211.

Our Common Future: A Canadian response to the challenge of sustainable development. Proceedings of the National Forum at Trent University, Peterborough, ON, August 18-21, 1988. Harmony Foundation of Canada, 225 Metcalfe St., Suite 501, Ottawa, ON, K2P 1P9, (613) 230-7353.

PERIODICALS

Earthkeeper. Information and advice for environmentally conscious consumers. Six issues. \$24 per year. 99 Edinburg Rd. S., Guelph, ON N1H 5P5 (519) 763-9357.

EcoDecision. Environmental issues affecting corporate strategy and national/international policy. Quarterly. \$125 per year. 276, rue Saint-Jacques Ouest, bureau 924, Montreal, PQ H2Y 1N3 (514) 284-3053.

Environmental Dimensions. News, analysis and trends impacting national environmental policy. Bi-monthly (except July/August). \$495 per year. 8 York St., 2nd Floor, Ottawa, ON K1N 5S6 (613) 232-2080.

Harmony, Learning to Live as if Nature Matters. Environmental news and tips for a broad audience, from children to business. Quarterly. \$21.40 per year. Harmony Foundation of Canada, P.O. Box 80001, Preston Postal Outlet, 438 Preston St., Ottawa, ON K1S 5N6 (613) 230-7353.

New Environment. Environmental developments and corporate strategies involving Canada's decision-makers. Quarterly. \$40 per year. 1057 McNicoll Ave., Suite 106, Toronto, ON M1W 3W6 (416) 964-0406.

The Corporate Ethics Monitor. Ethical issues and policies in the workplace. Six issues. \$297 per year (\$317 with GST). EthicScan, P.O. Box 165, Postal Station 5, Toronto, ON M5M 4L7 (416) 783-6776.

LEGISLATION

The Canadian Business Guide to Environmental Law. Ernest Lovett, LL.B. Self-Counsel Legal Series. Vancouver, British Columbia. 1988.

SUCCESS STORIES BANK

Sustainable Development, Corporate Policy Group, Environment Canada, Ottawa, ON K1A 0H3; fax: (819) 997-2800. Collects and promotes examples of how the private and public sectors have successfully integrated environmental factors into economic decision-making.

HEALTH CARE

Health Care Environment Network is a group of more than 100 hospitals, associations, health-care services and individual physicians in Ontario promoting waste reduction. Contact: Director, Public Affairs, Sunnybrook Health Science Centre, University of Toronto, 2075 Bayview Ave., North York, ON M4N 3M5.

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A FINAL WORD

We hope you have found this book helpful and that you've made progress toward improving environmental practices in your workplace.

The environmental field is rapidly changing and we'd like to hear from you if you have additional or updated information or have experiences or successes to tell about. We are particularly interested in innovative education and training programs and cooperative initiatives. Thank you.

To:
Harmony Foundation,
Box 3444 Station D,
Ottawa, Ontario K1P 6P9

From: _____

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(Title) _____

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☐ Our donation in support Harmony's environmental education programs is enclosed.

Please send information on ordering:

☐ additional copies of Workplace Guide

☐ Harmony's other publications.

Comments: _____

**HARMONY FOUNDATION
GREATLY APPRECIATES THOSE
ORGANIZATIONS WHO SUPPORT
OUR CONTINUED PROGRAM
DEVELOPMENT AND SHARE OUR COMMITMENT
TO THE PRINCIPLES OF LEADERSHIP,
INNOVATION AND EXCELLENCE IN
ENVIRONMENTAL EDUCATION.**

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INVEST IN THE FUTURE

Support Harmony Foundation's environmental education programs. In addition to workplace education, we also develop programs for:

EDUCATORS AND STUDENTS The Summer Institute for Environmental Values Education brings together educators and resource people from across Canada and other countries to explore innovative ideas for environmental education in classrooms and communities.

THE PUBLIC AND COMMUNITIES To assist individuals to contribute to environmental solutions, Harmony has several publications and resources: *Home & Family Guide: Practical Action for the Environment*, *Community Workshops for the Environment*, "Positive Action for the Environment" (a video), and "Harmony, Learning to live as if Nature matters" (a newsletter).

ENVIRONMENTAL LEADERSHIP Various programs bring together professionals from diverse backgrounds to find cooperative and innovative ways to respond to environmental problems and opportunities.

The decisions we make today profoundly affect the future. We all have the opportunity and responsibility to improve our environmental practices. Harmony is working hard to help individuals and organizations develop practical environmental knowledge and skills.

With your charitable donation we can help many more people to contribute to environmental solutions.

For more information on all our programs, to order more copies of Workplace Guide or to make a donation, please write,

Harmony Foundation
Box 3444, Station D
340 Laurier Ave. West
Ottawa, Ontario K1P 6P9

THE 1990S ARE THE ENVIRONMENT DECADE

Organizations of all types and sizes are seeking practical ways to protect the environment.

Whether you are a senior manager or concerned staff member, with a large corporation, a small business, a school, a home-office or corner store, this Workplace Guide will help your organization contribute to environmental solutions.

Workplace Guide offers a comprehensive, practical and easy to use approach to help you identify both environmental and economic benefits. It helps you assess your workplace operations and implement an effective environmental action plan, including:

- *energy and water conservation*
- *waste reduction*
- *purchasing practices*
- *property management*
- *staff education and training*
- *community outreach*
- *and much more*

While the impact of any one office, school or business may seem insignificant, the cumulative effort of tens of thousands of workplaces will achieve substantial environmental benefits.

We must succeed in our environmental efforts if we are to ensure a healthy future. Use this Guide and get started today.

With Compliments of:

