Chapter 8
Waste Management

All organizations consume large quantities of materials of all kinds: paper, paint and cleaning products and many more. Most of these products generate waste, much of which ends up at a landfill site or sorting centre. To avoid the profusion of separate initiatives with no overall vision, it is suggested that you adopt a waste management policy and/or waste management plan.

First, find out what types of waste collection services are available in your community: recycling, composting and so on. Then consider the following before launching any new initiatives:

- Keep track of how many bags of garbage your organization generates per week. Are there any opportunities to reduce this quantity? Set a target and work towards it
- Assess how much of your trash could be diverted through recycling or composting
- How much of your waste is connected to purchasing decisions? It may be time to re-evaluate and order less[1]

1. Waste characterization

Photo: Granby Zoo.

Regardless of whether you decide to establish a longor short-term plan, before establishing any waste management initiative, it is essential to have a good idea of the relative proportions of this waste (paper, plastic, putrescible waste, etc.). You can hire consultants to perform a detailed analysis of your waste.

Please consult the appendix for an example of a questionnaire produced by Environment Canada. It will help you get a better idea of your current situation.

Recyc-Québec has also developed an online guide, Zéro déchet au boulot,[2] designed to help businesses improve the efficiency of their waste management and collection. This guide is intended to accompany the implementation or improvement of a workplace waste management plan.

To achieve this goal, the guide suggests a 10-step process:

1. Committing to the goal: securing the clear support and commitment of senior management is essential
2. Effective coordination of efforts: establishing a green committee is a good way to ensure the cooperation, accountability, and involvement of managers and staff
3. Conduct a waste audit to accurately identify and quantify the waste generated by the organization. This detailed data will provide a yardstick for measuring subsequent program performance
4. Identify concrete actions for source reduction and reuse: double-sided printing, reusable dishes, etc.
5. Find a reliable waste collection company: select your supplier based on type of materials collected, frequency of pick-ups, etc.
6. Select appropriate waste collection equipment: based on aesthetics, volume, ease of handling, etc.
7. Effective information and awareness-raising campaign aimed at staff: identify communication objectives based on the objectives of the waste collection plan, and identify messages based on the employees you want to reach
8. Hold zero-waste events: make employees ambassadors of the waste collection plan in order to raise awareness of clients and business partners when holding zero-waste events
9. Monitor performance based on motivating objectives: compare the results with the data obtained in step 3
10. Publicize the commitment and results: for instance by obtaining an Ici on recycle certificate from Recyc-Québec

It is also important to emphasize employee training to ensure the success of the changes introduced. Whenever your organization hires a new employee, it is important to take the time to explain how to dispose of the various types of materials. Remember that the methods of disposing of workplace waste are generally not the same as for household waste. Make sure that recycling equipment is easy for clients to use.

[1]Green your Business: Toolkit for Tourism Operators, p57
[2]http://www.recyc-quebec.gouv.qc.ca/client/fr/gerer/travail/dechet-boulot/index.html

2. Reduce, reuse, recycle and reclaim (4Rs)

The 4Rs represent, in order of priority, the steps for responsible waste management: reduce at the source, reuse, recycle and reclaim. These steps help reduce waste of natural resources, while cutting down greenhouse gas emissions generated by transport and land filling.

A. Reduce at the source

Source reduction is the most effective step of the 4Rs because it encourages people to think about their consumption. The following principle should always be borne in mind: the easiest waste to manage is waste that is not generated in the first place. Reducing consumption automatically creates less waste, and reduces use of natural resources and energy to produce new goods and products. There are a number of ways to achieve reductions at the source, for example, by avoiding single-use products. An effective strategy for achieving this goal involves setting clear and measurable targets, implementing appropriate measures and periodically assessing progress. This approach makes it easier to target efforts and measure their outcomes.

Example: Reducing paper use
Ways to reduce paper use include:
- Programming automatic double-sided printing or setting up a dedicated printer using paper already printed on one side
- Using single spacing
- Reducing margins
- Printing as little as possible

Example: Reducing packaging
Ways to reduce packaging include:
- Imposing criteria on suppliers
- Purchasing products in bulk or more concentrated products
- Selecting products with no packaging or with compostable, reusable or recyclable packaging

B. Reuse

Reusing means finding a second life for a product or using it repeatedly without necessarily transforming its appearance or properties. Repairing an item, using used goods or finding other uses for an item are various examples of reuse. According to Recyc-Québec, reuse has impacts on the three areas of sustainable development (the economy, society and the environment) since it helps create jobs, helps preserve natural resources and redistributes goods through resale at second-hand stores.

C. Recycle

Recycling means transforming waste in order to create new products rather than using virgin material. For example, plastic bottles are used to make polar fleece garments and aluminum from cans is melted down to make new cans.

D. Reclaim

Reclaiming means deriving value that would otherwise go to waste from an item that has reached the end of its useful life; it means using some of the properties of waste through conversion or transformation. Biological treatment such as composting and anaerobic digestion as well as heat treatment (such as gasification and pyrolysis) are examples of waste reclamation.

The breakdown of organic matter, usually table and garden waste, causes acidification of the environment and generates biogas. When this waste is land-filled, the acid solution created travels via runoff and contaminates groundwater and surface water. In addition, land-filled organic matter, decomposing without oxygen, generates biogas composed primarily of carbon dioxide and methane that contributes to the greenhouse effect. Various other elements present in small quantities contribute to acid rain as well as releasing volatile organic compounds (VOCs). According to Recyc-Québec, waste contributes to the production of approximately 7.5% of total greenhouse gas emissions in Quebec.[3]

Reclaiming this organic matter is therefore an important tool for controlling climate change. Depending on the size of your organization, whether or not it provides food services and the number of visitors and employees, you can opt for on-site backyard composting, vermicomposting or, for larger volumes, hiring a company that runs a large-scale composting operation.

Backyard composting
This involves the set up and ongoing management of a composting unit at home. A backyard composter is a simple way for each of us to manage the organic wastes we generate. To get the best results, it is important to make sure that the right types and amounts of organics are used and that the composting process is properly maintained. Backyard composting experts are available, through your local municipality, to help explain the process and provide helpful suggestions. Whether with the use of a “build your own” unit or a commercial model, home composting avoids collection costs and creates an excellent soil conditioner for home gardening and landscaping.

It’s easy to find documentation about composting online for example from the Composting Council of Canada.[4] Municipalities also generally provide composting guides.

[3]Recyc-Québec, Les matières organiques : fiche d’information, March 2008, www.recyc-quebec.gouv.qc.ca/upload/publications/fiche-compost.pdf
[4]http://www.compost.org/AboutComposting.html

Vermicomposting
Vermicomposting is composting with worms. The best kind of earth worm to use is the red worm (also known as the red wiggler). These worms are incredible garbage eaters! They eat and expel their own weight every day, so even a small bin of red worms will produce many kilograms of rich, sweet-smelling compost. Finished compost can be harvested in as little as two or three months. Red worms are extremely prolific. It takes about three weeks for an egg to develop and as many as twenty youngsters can be hatched from one egg. In three months, the worms are sexually mature and will start breeding. Within a year you will be able to give worms away to get a friend started.

For more information on vermicomposting techniques and the equipment and materials required, check out Environment Canada:
http://www.on.ec.gc.ca/community/classroom/c7-compost-e.html

Grasscycling
Grasscycling means leaving grass clippings on the lawn after mowing. These clippings act as fertilizer, thereby reducing the quantity of fertilizer required, in addition to significantly reducing the volume of waste. If you opt for grasscycling, take advantage of this initiative to educate others: inform your clients about the method used and explain its benefits. We have to change the mentality of people who think that a lawn covered in grass clippings is poorly maintained.

3. Electronic components and devices

Computer components fall into the general category of information and communications technologies (ICT). This includes desktop computers, laptops, monitors, and peripherals such as printers, scanners and fax machines, televisions and telephones. These devices contain a number of toxic substances, such as lead, cadmium, beryllium, and mercury. These substances pose risks to human health and to the environment if not handled properly. For example, some heavy metals can cause health problems, specifically nervous system, kidney and blood disorders, and, when dissolved in water, lead can contaminate surface water or groundwater.

It is possible to reduce the number of electronic products in circulation by ensuring that you have clearly identified the relevant needs and requirements when purchasing these devices, and by choosing products that can be more easily upgraded. When the time comes to dispose of these devices, first consider the options for reuse. There are a number of organizations that will pick up old electronics, which they distribute to others who can make good use of them. If reuse is impossible, make sure that the devices are properly recycled. They could be refurbished for resale or disassembled and broken down into their various components. Following disassembly, many of the components and materials will be sorted, crushed and shredded for resale to recyclers and reprocessors and the heavy metals will be disposed of properly. For large-volume purchases, check whether retailers will agree to take back the computers they sell you once they become obsolete and include this clause in the sales contract.

The following is an excerpt from Green your Business (p. 61):

Electronics Recycling Across Canada
The *Electronics Recycling Association of Canada* has plenty of good information on the kinds of electronics that can be reclaimed or recycled. It also coordinates pickups that you can schedule using its online form or drop-off locations in major cities including Montreal, Toronto, Edmonton, Calgary and Vancouver. Home Depot, Canadian Tire, Future Shop and Best Buy have jumped on board and are now offering bins in their stores for unwanted or used batteries and other electronics. *Mountain Equipment Co-op* has taken a step forward to limit its impact on the natural environment by initiating a battery recycling program within each of its stores across Canada. *reBoot Canada* is a non-profit organization that offers refurbished computers and technical training to charities. It now has locations in Toronto, Vancouver, Peterborough, Montreal, Fredericton and Dartmouth.

For more information on recycling electronics:

- In Quebec, Targray Technology International Inc. recycles CDs and DVDs
  http://www.targray.com/opticalmedia/products-categories-recycling.html
- Future Shop
  http://www.futureshop.ca/marketing/recycle/default.asp?newlang=EN&logon=&langid=EN
- Best Buy
  http://www.bestbuy.ca/marketing/recycling/en/default.asp?logon=&langid=EN
- Greentec
  http://www.greentec.com
- Le réseau québécois des CFER is a network of business and recycling training centres dedicated to promoting the social integration of young people who do not have a recognized diploma (French only)
  http://www.reseaucfer.ca/Accueil/
- Recyc-Québec (French only)
  http://www.recyc-quebec.gouv.qc.ca/Upload/Publications/Fiche-tic.pdf
- Greenpeace has developed a guide to greener electronics with a ranking of leading computer manufacturers based on their efforts to eliminate hazardous chemicals and their commitment to post-use recycling of their products
  www.greenpeace.org

4. Construction materials

Concrete, bricks, wood and gypsum or drywall are just a few examples of waste generated by construction, renovation and demolition projects. The best way of dealing with this waste, which is also the most expensive method, is source sorting for immediate reuse or resale. There are also companies that rent out, pick up, and transport bins and dumpsters to sites authorized to receive this type of waste.

There are a number of markets for this recycled waste. Here are a few examples:

- Steel from reinforced concrete is recycled to make reinforcing steel, beams and framing
- Bricks are used as fill material, drainage stones, aggregates in the production of concrete
- Gypsum/drywall is used to make fertilizer, animal bedding, acoustic insulation, thermal insulation

To promote reuse, we should talk about deconstruction rather than demolition. Deconstruction is easier if it is planned at the building design stage. When undertaking a deconstruction project, proper sorting and storage bins must be provided throughout the process. Companies that specialize in deconstruction can easily be found in the Yellow Pages or on the web.

For information on recycling construction waste:

- Recyc-Québec (French only) offers a list of waste collectors, and a fact sheet on construction, renovation and demolition
  http://www.recyc-quebec.gouv.qc.ca/Upload/Publications/Fiche-crd.pdf
- Quebec Department of Sustainable Development, Environment and Parks
  http://www.mddep.gouv.qc.ca/matieres/inter_en.htm
- Natural Resources Canada
  http://nrcan-rncan.gc.ca/mms-smm/busi-indu/rad-rad/rad-cdb-eng.htm

5. Restaurant waste

Restaurant waste is primarily composed of packaging and organic matter.

Here are a few tips for reducing packaging:
- Select the product with the least amount of packaging when several comparable options are available
- Work with your suppliers to find solutions for eliminating unnecessary packaging
- Minimize wrapping of food that you sell
- Make sure that you recycle packaging that can be recycled

Here are some tips for reducing organic waste:
- Make sure that you know your needs so that you order the proper quantities
- Make arrangements with a local charity to pick up leftovers
- Arrange pick-ups of used oil
- Compost

Depending on the volume of waste, an institution can do the composting itself or hire a specialized company to collect the compostable waste. It is essential that organic matter be stored properly before treatment, whether or not it is picked up by a company. If an institution chooses to do composting, the compost could be used in the maintenance of the green areas.

The following two websites provide some advice on greening your food service:
- Green Restaurants
  http://www.greenrestaurants.org/
- Ecopreneurist
  http://ecopreneurist.com/2008/09/11/making-greening-your-restaurant-easy-rewarding-and-free/

6. References and tools

- Waste Management Guide for Small and Medium Enterprises – Environment Canada
  http://www.qc.ec.gc.ca/dpe/Anglais/dpe_main_en.asp?innov_guide_mat_residuelles
- Recyc-Québec's Ici on recycle program (French only)
  http://www.recyc-quebec.gouv.qc.ca/client/fr/programmes-services/prog-reconnaissance/ici.asp
- Composting Council of Canada
  http://www.compost.org/
- MDDEP (French only)
  http://www.mddep.gouv.qc.ca/matieres/inter_en.htm
- Éco-guide from the Centre écologique de Port-au-Saumon offers technical data sheets on various topics: energy, recycling, composting, waste, GHGs, water, procurement, financial assistance, etc. (French only)
  http://www.cepas.qc.ca/autre/ecoguide_complet_web.pdf
- Centre de transfert technologique en écologie industrielle (French only)
  http://www.cttei.qc.ca/comm_articles.php

Communications technology

- Recyc-Québec fact sheet on information and communications technologies (ICT) waste (French only)
  http://www.recyc-quebec.gouv.qc.ca/Upload/Publications/Fiche-tic.pdf
- Dell
  http://www1.ca.dell.com/content/topics/reftopic.aspx/dhs/en/recycling_landing?c=ca&cs=cadhs1&l=en&s=dhs~&ck=pn
- Toshiba
  http://www.toshiba.ca/web/link?id=2203
- IBM and Lenovo
  http://www-03.ibm.com/financing/ca/en/recovery/small/recycling.html
- Canon
  http://www.canon.ca/english/index-thecleanearth.html
- Hewlett Packard
  http://h30248.www3.hp.com/recycle/ca/index.html?jumpid=recycle
- Environment Canada, Extended Producer Responsibility and Stewardship
  http://www.ec.gc.ca/epr/default.asp?lang=En&xml=EEBCC813-211E-4BB7-9AB6-BEA228C133B8
- Electronic Product Environmental Assessment Tool
  http://www.epeat.net/
- Electronic Products Stewardship
  http://www.epsc.ca/index.html
- Canadian Council of Ministers of the Environment
  http://www.ccme.ca/ourwork/waste.html?category_id=129

Construction materials

- The Environmentally Responsible Construction and Renovation Handbook
  http://www.tpsgc-pwgsc.gc.ca/biens-property/documents/pubs-ea141-eng.pdf - ENG
- Canadian Construction Association
  http://www.cca-acc.com/homepage_e.asp
- BOMA Canada
  http://www.bomacanada.ca
- RECYC-QUÉBEC documentation centre and website – CRD section (French only)
  http://www.recyc-quebec.gouv.qc.ca/client/fr/rubriques/documentation.asp?idTypeLib=25
- Regroupement des récupérateurs et des recycleurs de matériaux de construction et de démolition du Québec (3R MCDQ) (French only)
  http://www.3rmcdq.qc.ca/index.html
- US Green Building Council
  http://www.usgbc.org

Restaurant waste

- Greening food services
  http://www.greenrestaurants.org/
  http://ecopreneurist.com/2008/09/11/making-greening-your-restaurant-easy-rewarding-and-free/
- Used oil (French only)
  http://www.recyc-quebec.gouv.qc.ca/Upload/Publications/Fiche-huiles.pdf
- Used Oil Management Association
  http://www.soghu.com/en/cf.aspx?prov=11
- Paint recycling (French only)
  http://www.recyc-quebec.gouv.qc.ca/Upload/Publications/Fiche-peintures.pdf