

# **21<sup>st</sup> CENTURY RECYCLING:**

## **PRACTICAL ADVICE FOR A ZERO WASTE SOCIETY**

# INTRODUCTION

No one wants a landfill in their backyard. Certainly, no one wants emissions from these landfills to contaminate air, soil and water with toxins and greenhouse gas emissions. However, to do something about it takes a critical mass of consumers to commit themselves to recycling their old “junk” and a concerted effort to get legislation passed that will encourage this at the manufacturer-level.

Let's take the very common example of an old, out-of-date computer system. Contained within that box (that was probably manufactured to be thrown away) are hazardous materials, precious metals and other highly recyclable materials. Everyone has one and most everyone has gotten rid of at least two or three of them when they become obsolete.

But when the last person who is willing to tolerate this old system is finally fed up or, it finally breaks past the point of salvage, what is to be done with these machines rather than toss them into a landfill where they'll very slowly decompose over (quite literally) millions of years and contaminate soil and water with their highly toxic component parts?

Computers are just one example – we are surrounded by other examples every day from old shower curtains to used take out containers. Transitioning to a zero-waste society will take effort from the purchases we make to the elected representatives we choose. The reward will be nothing less than continued survival.

## AN OVERVIEW OF THE WASTE PROBLEM

Those in North America are often maligned as being the most wasteful societies on Earth, and it's true. We throw away a staggering amount of waste. About 1,600 pounds of trash is generated by each person per year. Much of this is perfectly recyclable could be useful as materials to make new items, which is important when rising oils costs make the price of all items go up.

This waste is very often also toxic or a powerful producer of greenhouse gases when simply dumped into a hole somewhere, as is very often the case.

This pollutes soil and air, as well as runoff water. But the water is also polluted from this directly, with nearly 14 billion pounds of it having been dumped into the world's oceans by the early 1990's – a figure has continued to increase since.

The major contributors to landfill waste remain recyclable items. In recent studies, North American landfills contained nearly 50% paper waste and as much as 30% construction waste. While recycling rates have continued to go up steadily since the 1990s, the total amount of waste generated has also increased, making the actual percentage of waste that's recycled actually remain even.

Interestingly, a major contributor to the amount of solid waste generated in North America through the 'aughts has been an increased reliance upon eating out and other types of prepared meals. Even when they do eat at home, the average North American household throws out nearly 15% of the perfectly edible food they purchase – or about \$75 billion worth. When the waste of the food industry is taken into account, nearly half the food produced in North America is eventually wasted, with only a tiny fraction of that being composted.

Whether packaging, container waste, toxic wastes, radioactive remains or simply leftover scraps, the notion that things should only be used once is now being exposed for the 60-year mistake that we perhaps all feared might be the case.

## **RECYCLING PROGRAMS THAT WORK**

Of course, for recycling to be a viable option, someone must coordinate the pickup and sorting items. On the other side, there must be a market willing to buy recycled materials and turn them into something else. This not only requires innovation on the part of industries, but also a consistent and uniform product.

To meet these demands, the most successful recycling programs are able to get a steady and high level of compliance by making recycling simple enough for consumers. The bins must be everywhere and should be keyed in to where people are the most likely to be using recyclable materials. Such programs often are those that provide good quality bins for people to put their recyclables into. As soon as the public is required to change too much or put forth any type of investment in the scheme, compliance falls considerably.

Generally speaking, programs that allow as much controlled co-mingling as possible are the most successful, followed by those that provide labeled bins for each item. Each of these systems allows for either a single bin or a series of small ones to easily take the place of the single trash bin that so many are already used to. Even a single extra step can make a big difference in the amount of trash that people are likely to recycle.

## **GETTING EDUCATED ABOUT MUNICIPAL RECYCLING SERVICES**

To know what items are best to keep out of your recycling stream, what your hauler does take and which bins everything belongs in, you'll have to do a bit of studying. All municipalities are different (though similar) so, don't think you know what the deal is when you move to a new town or even a different part of a large city. Often, the practices are determined by the trash hauler, not by an entire city or county – it depends.

You'd think that these organizations would do a good job of communicating what they want or at least making the information easily available. However, this is not always (or even often) the case. Your local trash hauler has, in most areas, been in the shadows of public relations. In short, they're not very good at this sort of thing. Even if a public relations firm (as is sometimes done in cities) are chosen to communicate their system to the rest of the community, the effort may come in less than effectual bursts.

The odds are that you'll have to do a bit of your own looking to find out what is expected of you. Your city or town website is very often a good place to start. You may also be able to request reference materials from your trash hauler by simply calling the number that's printed on the side of your trash can. There may also be information about your local recycling at other related websites or even at the local library.

It is very likely that all but the most commonly recyclable items, you'll have to handle yourself. This very often includes odd or hazardous wastes, such as batteries, electronics, carpet and many other common daily objects and household necessities.

# **SORTING AND CLEANING THAT ENSURE SUCCESS**

It is imperative that recycling programs do a good job of sorting, both on the consumer end and back at the collection site. Many municipal recycling schemes use social assistance programs to place out of work people with relatively high-paying jobs on the sorting lines. The better the sorting process, the higher number of uses you can advertise and sell the recycled product for.

The greater the number of uses for the product, the better the price your community will be paid for the recycled equipment and the more demand will be placed upon the company expanding its collection/compliance levels. More energy is saved and more pollution is avoided.

You can do your part by making sure to reliably put only the proper recyclables into your recycling buckets. In some communities this can be a very strict separation of different glass colors and various types of plastic. In other places, you may "co-mingle" various types of recyclables together, while being careful to avoid the "contaminants" that are the biggest time- and money-wasters for sorting facilities.

Keeping plastic bags out of your recycling "stream" is a very good example of a relatively simple thing one can do to keep the recycling in your local area profitable and salable. These can be avoided by using your own bags, keeping the bags you do get separate, reuse them whenever possible, and bring them to a proper disposal site when they build up.

## **COMPOSTING YARD AND KITCHEN WASTE**

A very large amount of the waste that makes its way to landfills is comprised of organic matter that may be decomposed by micro-organisms. Such carbon-containing matter commonly includes kitchen scraps, soiled bits of paper, coffee grounds and old grass clippings, to name just a few. The typical North American household tosses out about 12 pounds of the stuff per week or nearly 40% of their weekly rubbish load.

In most areas, this goes directly into the increasingly small number of landfills where it will be buried. Here, this waste will decompose without the

benefit of oxygen. This anaerobic decomposition produces copious amounts of methane rather than the otherwise harmless nitrogen that is produced during aerobic decomposition as is found in a healthy compost pile.

This is important because methane is produced from these landfills in massive quantities and known to be 45 times better a greenhouse gas than carbon dioxide. In fact, for as much carbon dioxide as has been pumped into the atmosphere since the industrial Revolution in the mid-18<sup>th</sup> century, the amount of methane (as a percentage of the atmospheric content) has increased by about three times as much.

As a consumer you have the option of lobbying your local trash hauler, city or county to setup some type of community composting. Some cities even offer compost pickup from the curbside in special compost bins. Other areas have compost drop-off sites that are very busy taking leaves and other yard debris in the spring and autumn. Such sites are very often used as the source of the organic fertilizer that's used in parks and city-maintained landscapes.

You can also make your own compost pile and make your own organic fertilizer. This is actually quite simple to do, requiring little but a tarp and shovel. Some areas sell or give away home composting bins (made of recycled plastic, of course) that allow for proper aeration and a little door allowing you to simply dig the finished fertilizer out from the bottom, so no bothersome flipping is required.

Either way you end up going with your organic, solid waste, there's no excuse for sending it to a landfill. That stuff is valuable for maintaining fertility in the soils of both urban and rural North America. This becomes especially true as people are increasingly moving towards organic gardening in their own yards and organic produce in the grocery.

## **SAFELY DISPOSING OF HAZARDOUS HOUSEHOLD WASTE**

Among the most vexing items that are most often tossed in the landfill out of sheer confusion and frustration are the many hazardous waste items. This includes many of the components of complex recyclables as well as the obvious toxins such as paint, household chemicals, pesticides, motor oil, batteries and anything else containing man-made chemicals or dangerous metals.

The recycling of such components is often complicated by the intermittent nature of hazardous recycling programs. Very few communities regularly collect hazardous waste. The most common type of hazardous waste pickup at the curbside is motor oil, which is often collected only in very particular containers.

Many types of hazardous waste are only picked up once or twice per year from centralized locations during hazardous waste drives. Some communities have one or two days per year when such waste can be picked up from special containers at the curb. More often than not, you'll have to seek out the officially mandated collection site for such waste and be sure you deliver it in the forms that are acceptable.

You can do your part by checking with the agencies that handle recycling and asking about the hazardous waste program in your area. Even a single sweep of the garage can nab a whole car-load of items that are best disposed of by professionals rather than contaminating your local environment or even escaping into the sewers. Certainly pouring such things down a drain is never the way to dispose of them, though many people do.

You can make even more of a difference by talking to your neighbors and taking their hazardous materials in when you're making the trip yourself. If your community doesn't have regular hazardous material drives, you can encourage your local company to organize and advertise them.

## **BATTERY RECYCLING**

Batteries are such a large part of toxic material recycling, that it is very often considered separately. This includes many different types of batteries, further adding to the bother when it comes to recycling them. Not only do they come in many different sizes, but several disparate and similarly toxic substrates are used in each different kind. But, compliance with battery recycling programmers can have tremendous impact on the deposition of toxic chemicals in landfills and the larger environment. For instance, over 90% of the lead used in North America during the 'aughts is recovered from recycled car and truck batteries.

Automotive batteries are a particularly good success story. They are more similar to each other than other classes of consumer batteries. Nearly all are lead-acid in construction. County, state and provincial laws ensure that manufacturers take the old batteries back when selling new ones, ensuring that they're recycled at a very high rate – over 95% in most of the US.

Alkaline, coin-type and rechargeable batteries all are considered more difficult to recycle, since they contain a great deal of packaging to make them safe to consumers. They come in a large number of sizes and materials, making them difficult to sort compared with most other types of recyclable equipment.

There are fewer incentives to recycle these types of batteries, so there is little, if any, financial incentive for local recycling programs to take these batteries for recycling at all. In fact, most companies end up paying companies to take the batteries away for "refurbishing." Even refurbishing operations often throw away much of the hazardous battery materials if not monitored by the states.

You can help by purchasing rechargeable batteries and being sure to hold on to them until the next hazardous waste collection day instead of throwing them away. Choose rechargeable batteries over the coin type batteries that are very often found in power-saving consumer devices such as LED flashlights.

## **RECYCLING ALL TYPES OF PAPER**

Even if you don't print out the North American average of 30+ pages per day or get the morning newspaper or even purchase highly packaged goods at the grocery, you might be amazed just how much paper waste you generate in a given year. Recycling paper results in massive energy, fresh water, carbon dioxide and natural resource savings – as much as 75% in many cases.

Paper also happens to be one of the most recyclable items. Clean office paper can now be easily separated from its inks and toners, with the resultant pulp being used in a wide variety of products, including new paper that is almost indistinguishable from the old. More often, however, paper is mixed together with news print and other types of lower grade paper products to create a lower-grade or "down-cycled" type of paper product.

You can make a very big difference by recycling what paper you can and composting the rest as additions of "brown matter" that keeps the high nitrogen kitchen scraps adequately supplied with carbon.

# **REDUCING THE WASTE YOU BUY**

The most important part of the recycling hierarchy is the reduction of waste in the first place. This is most often done by paying strict attention to the things you purchase. You can make an effort to purchase items with a minimum of packaging. Though such decisions often require you to make a fundamental shift in what motivates your purchase impulse, such a sensible course of action is often made easier when funds are low.

Learning how to make more of the things you use in your daily life for yourself has a tremendous impact on how much rubbish you'll even need to plan for. People who grow and cook their own food, composting the scraps and sending them back to the soil as compost, have little (if no) rubbish to worry about.

Let packaging be part of your purchasing decisions just as much as what's on the inside. There is almost always a low-packaging item. Choose packaging that can be composted at home (such as paper or string) or recycled whenever possible over plastics that will remain for thousands of years.

# **REUSING TO ELIMINATE WASTE**

Just because you want to be responsible for less waste that's created, that doesn't mean you have to eliminate shopping. However, it might mean shopping at the grocery store bins and bringing your own reusable container instead of just picking up whatever.

For instance, you can get milk in a reusable glass container (and collect your bottle money whenever you run low) rather than a plastic jug that is far less likely to be recycled. Another example might be turning old tuna cans into muffins rings for making your own bread products, further saving the inevitable plastic bag that such products often come in. Making your own food (rather than buying it processed) also very seriously cuts down on the amount of waste generated in a typical household.

# **STAMPING OUT PLASTIC WASTE**

Purchase decisions also figure highly in the amount of nearly immortal plastic that you bring into your own personal "waste stream." This can be anything from plastic water or pop bottles to the plastic wrap so often used in conjunction with the microwave to the plastic that is put up each year in lieu of real double-paned windows.

While the switch back to glass from plastic can seem like a bother, never having to worry about what's leaking out of your containers is a good trade-off. Also, glass eventually turns back into harmless sand, while plastic increasingly ends up slowly photo-degrading in great ocean gyres and in the bellies of sea life.

Choose the glass, metal or natural fiber alternative when purchasing virgin materials and consider using recycled plastic materials when used will do. Refuse to purchase items with unnecessary plastic packaging or parts.

# **ELECTRONIC RECYCLING**

Electronic devices are not only very common, but commonly end up in landfills. These complicated recyclables often contain precious metals and materials, as well as toxic metals and dangerous components. The computer mentioned at the beginning of this report is a very good example. Encased in a plastic box that off-gases and full of antimony-laden circuit boards that are held together with lead solder, computers present a real disposal challenge.

The best possible use of an old computer is to find some way to make it useful for someone else. Some charter programs match low-income folks to older computers while teaching them how to use free-ware computer programs that can take advantage of slower machines.

When even this isn't enough to justify the life of your old computer, it can be taken apart and separated out into constituent components. This is most often initially done on old and broken machines to recover gold from the contact. Several dollars can be made per pound of crushed circuit boards from very simple methods.

From there, many of the components must be handled by hazardous waste professionals to keep them from entering the soil and water supply. This is very often done in third-world countries where labor is cheap. Sadly, the other most common reason is that these toxic materials are often simply dumped into landfills in areas that don't have environmental protection laws.

You can make sure your computer makes as little negative impact as possible by using it as long as possible. Purchasing a top of the line model can extend the useful life of your machine by several years. Choosing to repair rather than replace is also very "green," saving a large amount of both energy and pollutants.

Be careful when choosing a recovery program to send your computer along to – check to make sure they actually use the machines domestically as much as possible. The Earth is functionally a closed system, and soil pollution in China is eventually water pollution in North America. Hazardous materials must be disposed of in special incinerators or collected and reused for other (hopefully less "consumer-oriented") uses.

Check with your local hazardous materials recycling program to see if there's a recommended electronics recycling service that has been investigated for responsibly disposing of as much of the plethora of materials found in most electronic devices.

## **SLASH YOUR GARBAGE BILLS**

It is not unreasonable to assume that when the crisis in North American landfills becomes more apparent in very high garbage hauling bills that municipalities will go to much greater lengths to separate out recycled materials that people have inadvertently thrown away. This is most cost effective when voluntarily done as part of a larger, distributed first stage of sorting.

In many areas, the cost of transport to a landfill has prompted governmental regulation and action to force people to get serious about recycling. The clearest way to do this is to charge people per volume of trash that's hauled away. As soon as folks are charged for their trash (but not the recycling), then there's a serious incentive for people to slash their grocery bills as much as possible.

It's more than possible, though reducing, reusing, composting and recycling, to cut the rubbish output of a household to one or two bins per year. This may sound extreme, but it's very possible and has already been observed in

communities such as Taipei, where rubbish rates dropped by as much as 90% as soon as people felt the real cost of hauling away trash to a landfill.

## **CONCLUSION**

Not only are there plenty of reasons why recycling is a very sensible thing for anyone to do, but there are also very practical and serious threats to the health and well-being of the people (and ecosystems) on Earth. Recycling is not the answer to everything that is represented by resource scarcity in the 21<sup>st</sup> century, but it is part of a comprehensive package that can bring the Earth closer to the zero-waste society that must be part of the new century.