**CASE STUDY**

**The New Alchemy: Creating Gold from Garbage**

Most people think of recycling in terms of newspapers, plastic bottles, and other household goods. Your daily household recycling is the bedrock of recycling programs, but another growing and exciting area of recycling is done at commercial and industrial scales. The 230 million tons of garbage the United States produces each year includes some knotty problems: old furniture and carpeting, appliances and computers, painted wood, food waste. It’s no wonder that we’ve simply dumped it all in landfills as long as we could. But landfills are becoming more scarce and more difficult to site (fig. 13.1).

In addition to organic waste, one of our largest sources of waste is construction and demolition debris—the rubble left over when a building is torn down, remodeled, or built. Construction and demolition accounts for over 140 million tons of waste per year, about 1.5 kg per person per day—on top of the 230 million tons per year of municipal solid waste. All this mixed debris is normally trucked to landfills, but alternatives have emerged in recent years.

A slowly growing number of cities and companies are sending their waste, including construction debris, to commercial recyclers. One of these recyclers is Taylor Recycling, based in Montgomery, New York. Starting as a tree removal business, Taylor has expanded to construction and demolition waste and now operates in four states. The company recycles and sells 97 percent of the mixed debris it receives, well above the industry average of 30 to 50 percent. Trees are ground and converted to mulch for landscaping. Dirt from stumps is screened and sold as clean garden soil. Mixed materials are sorted into recyclable glass, metals, and plastics. Construction debris is sorted and ground: broken drywall is ground to fresh gypsum, which is sold to drywall producers; wood is composted or burned; bricks are crushed for fill and construction material. Organic waste that can’t be separated, such as food-soaked paper, is sent to a gassifier.

The gassifier is like an enclosed, oxygen-free pressure cooker, which converts biomass to natural gas. The gas runs electric generators for the plant, and any extra gas can be sold. Waste heat warms the recycling facility. The 3 percent of incoming waste that doesn’t get recycled is mainly mixed plastics, which are currently landfilled.

From their base outside of New York City, recycling is clearly a good idea. New York has used up most of its landfill space and now ships garbage to Virginia, Ohio, Pennsylvania, and South Carolina. Fuel and trucking costs alone drive up disposal costs, and with landfill capacity shrinking, tipping fees are climbing. Every day, roughly 1,000 garbage trucks leave New York City, carrying garbage to other states. The average round trip is 300 miles, at less than 4 miles per gallon of fuel.

**The Story of Garbage Is Changing Globally**

In Western Europe and Japan, there is a rapidly growing industry in composting municipal solid waste. The Swiss company Kompogas, a leader in the industry, uses giant anaerobic (oxygen-free) tanks to compost organic waste. The methane produced can be burned as natural gas in cars, trucks, and electricity generators. Selling this gas adds to company profits. The sterile compost is an ideal fertilizer for gardeners and farmers.

In Europe this industry is aided by new laws that make it illegal to dispose of organic waste in landfills. Those laws protect dwindling open space. They also protect the global climate, since decaying garbage in landfills produces abundant volumes of methane, one of our most important greenhouse gases.

China has also had a recycling revolution. Hungry for all kinds of industrial materials, Chinese manufacturers have found rich resources in American and European discarded paper and other waste. Garbage has long been one of the United States’ largest exports. Now, growing volumes of recycling are traveling to China in otherwise-empty shipping containers, then returning as new packaging for goods and electronics.

Recycling is a rapidly growing industry because it makes money coming and going. Recyclers are paid to haul away waste, which they turn into marketable products.

You might not think of it often, but waste management is an exciting and innovative industry. Companies such as Taylor Recycling and Kompogas provide huge social and economic benefits while making money. Often when we discuss environmental problems, it seems businesses are part of the problem, but these examples show that business owners can be just as excited as anybody about environmental quality.

How big a part of waste management do these stories represent? In this chapter we’ll examine this question. We’ll also look at our other waste management methods, the composition of our waste, and some of the differences between solid waste and hazardous waste.