

Grappling With a Garbage Glut

We toss out 7 pounds of trash a day each, spending billions to manage it

BY EDWARD HUMES

EACH WEEK, we push our trash to the curb, and it seemingly disappears. But where does it all go: the spent cartons of milk, the computer keyboard fried by spilled coffee, those empty dog food cans?

A team of researchers at the Massachusetts Institute of Technology decided to find out. In 2009, they began attaching transmitter chips to thousands of pieces of ordinary garbage. They tossed his "smart trash" into the bin, sat back and watched the tortuous, disturbing path that our garbage often takes: the meanderings of electronic waste as it headed for distant shores; ofatty old sneakers that ran the equivalent of a dozen marathons, of printer cartridges that traversed the continent not once but twice on the mad to recycling.

This clever experiment threw a spotlight on the biggest, costliest, dirtiest secret about our garbage: our ignorance of how much we produce, what it contains and what happens to it once it leaves our hands.

Take the nation's official trash tally—used alike by environmentalists, businesses and policy makers—which maintains that the average American tosses out 4.4 pounds of trash a day, with about a third getting recycled and the rest going to landfills. These numbers are found in the Environmental Protection Agency's exhaustive annual compendium "Municipal Solid Waste in the United States"—America's trash Bible—and are determined by an array of byzantine estimates and simulations, based on manufacturing data and the life expectancy of products.

OUR ANNUAL WASTE

19 billion pounds of polystyrene peanuts

40 billion plastic knives, forks and spoons

28 billion pounds of food

Enough steel to level and restore Manhattan

Enough plastic film to shrink-wrap Texas

Source: Garbology

But the EPA's "materials flow analysis" dates back to the bad old days when there were 10 times the number of town dumps and many more illegal ones, with little actual weighing and regulation. Today the business model of the landfill and recycling business depends on precise measurement (and billing per ton), so we have much more real-world data. Using these sources, the most recent survey conducted by Columbia University and the trade journal BioCycle found that Americans actually throw out much more than the EPA esti-

mates, a whopping 71 pounds a day, and that less than a quarter of it gets recycled.

So how does America's trash weigh in? Here are some key numbers from the emerging science of garbology:

- At 71 pounds of trash a day, each of us is on track to produce a staggering 102 tons of waste in an average lifetime.

- Trash has become America's leading export: mountains of waste paper, soiled cardboard, crushed beer cans and junked electronics. China's No. 1 export to the U.S. is computers, according to the Journal of Commerce. The United States' No. 1 export to China, by number of cargo containers, is scrap.

- American communities on average spend more money on waste management than on fire protection, parks and recreation, libraries or schoolbooks, according to U.S. Census data on municipal budgets.

As these snapshots suggest, garbage costs are staggering. New York City alone spent \$2.2 billion on sanitation in 2011. According to the city's department of sanitation, more than \$300 million of that was just for transporting its citizens' trash by train and truck—12,000 tons a day—to out-of-state landfills, some as far as 300 miles away. How much is 12,000 tons a day? That's like throwing away 62 Boeing 747 jumbo jets daily, or driving 8,730 new Honda Civics into a landfill each morning.

On the opposite coast, Los Angeles has opted to construct a garbage incinerator 500 feet high, taller than most of city's high-rises. This is Puente Hills Landfill—trash as geologic feature, full of 60 years' worth of decomposing garbage that the methane it produces pumped into generators that produce enough power for 70,000 homes.

At the landfill's flat and dusty summit, a dozen bulldozers and graders swing every day, backing and turning,

One emerging technology—the garbage death ray—vaporizes trash with arcs of electrical energy.

"More people should see what I see here," says Michael "Big Mike" Speiser, whose job is to sculpt trash into a mountain with the blade of a bulldozer. "Everything that's advertised on TV ends up [here] sooner or later, a lot sooner than most people think."

Puente Hills is just the largest of 1,900 municipal landfills operating nationwide. The chief executive of Waste Management, the world's largest trash company, estimates that there is at least \$20 billion in valuable resources locked

inside the materials buried in U.S. landfills each year, if only we had the technology to recover it cost effectively.

The U.S. doesn't have to handle trash his way. Other countries with big economies and high standards of living have rejected the disposable products that make up so much of America's garbage—in part because European countries hold manufacturers, not taxpayers, responsible for the costs of packaging waste. With that sort of incentive, toothpaste tubes need not come in redundant cardboard boxes and television sets can leave the store with no boxes at all. The average Dane makes four pounds of trash a day, according to the Organization for Economic Cooperation and Development; the average Japanese generates 2.5 pounds.

Other countries also are shunning landfills. Austria, the Netherlands, Sweden, Belgium and Denmark all send less than 4% of their garbage to landfills; Germany does no landfilling at all. Recycling rates there are two to three times America's, and the rest of their trash goes to waste-to-energy plants.

The preferred mode in Europe is to build not a few hugely expensive incineration behemoths but a larger number of smaller, community-based utilities that burn trash to provide electricity and heat through underground conduits. The technology in the newest plants limits toxic emissions of dioxins, a major issue with incinerators of the past, to levels similar to a backyard barbecue's. Carbon emissions are less than those emanating from landfills. One facility being built in Denmark will be hidden beneath a community ski park featuring three different slopes of various difficulties.

Both L.A. and New York City are considering major waste-to-energy projects, and Waste Management is experimenting with new technologies, including a test facility in Arlington, Ore., that uses a process known as plasma gasification. The technology vaporizes (but doesn't burn) garbage with arcs of electrical energy that heat matter inside their beam to 25,000 degrees. The process takes place in the absence of oxygen, so many

of the normal, noxious byproducts of combustion aren't produced. Instead, out comes a synthetic gaseous fuel and a lump of shiny rock, not unlike volcanic glass, with toxins locked up inside in relative safety. This garbage death ray reduces trash volume by 99%, not even leaving ash behind—just 20 pounds of obsidian for every ton of trash disintegrated. The process is still too expensive to be commercial, but it shows promise.

Of course, the best way to reduce trash is to waste less in the first place. Cut out disposable plastic bags or bottled water. Buy used or refurbished electronics. Consider whether that thing you're buying will be treasured for years to come or discarded in a few months. The real sacrifice, even when it is invisible to most of us, is accumulating ever more things that quickly find their way to our costly, growing mountains of garbage.

Adapted from "Garbology: Our Dirty Love Affair With Trash" by Edward Humes, by arrangement with Avery, a member of the Penguin Group (USA). Copyright © 2012 by Edward Humes.