

THE NEXT FRONTIER FOR MSW

Source reduction and recycling manufactured product waste has failed, while organics recycling has met with success. Analyzing community benefits in phasing out welfare for product discards.

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WASTE SURVEYS conducted at the beginning and at the end of the 20th Century provide valuable insights into today's solid waste problem. These data tell us a lot about the failures of our current approach - and point the way to a more promising alternative approach to municipal waste management - an alternative that puts composting up front and center.

The municipal waste management system was established a century ago to protect public health in America's growing industrial cities. But it has had the unintended consequence of giving rise to the Throw-Away Society. Waste managers have been proven powerless at controlling the rising tide of waste. Furthermore, the infrastructure designed for the waste stream of 1900 is completely unsuited to the waste stream of 2000.

To address these problems, the Product Policy Institute recommends a reassignment of responsibility. Product wastes should never enter the municipal waste system; rather they should be the responsibility of their producers "from cradle to cradle" under regulated programs of extended producer responsibility. Meanwhile community-generated organics should be managed in local, appropriately designed facilities that make optimal beneficial use of these materials.

MUNICIPAL REFUSE AT THE DAWN OF THE 20TH CENTURY

The earliest municipal waste managers characterized municipal refuse using three categories: ashes, garbage and rubbish. Ashes

were the residue of coal and wood used for space heating and cooking; garbage was the putrescible wastes produced in food preparation; and rubbish was a miscellaneous category made up of various worn out products and packaging. Surveys conducted during the early part of the 20th Century found that ashes were by far the largest category of refuse. "Between 1900 and 1920," writes historian Martin Melosi, "each citizen of Manhattan, Brooklyn, and the Bronx annually produced about 160 pounds of garbage, 1,231 pounds of ashes, and 97 pounds of rubbish." According to Melosi, these figures fall pretty much within the ranges identified in other studies where garbage ranged from 100 - 180 pounds, ashes from 300 - 1,000 pounds, and rubbish from 50 - 100 pounds.

In addition to the wastes collected from households and businesses, municipal waste managers faced a staggering quantity of organic wastes generated by the horses that served as the main means of transport in cities. Each horse was estimated to produce 20 pounds of manure and gallons of urine daily. In addition, since city horses had a life expectancy of only a couple years, their carcasses were an additional burden on the waste management system. Melosi wrote in his book, *Garbage in the Cities*, that as late as 1912, when motor vehicles already dominated the streets, scavengers removed as many as 10,000 horse carcasses from the streets of Chicago.

Not surprisingly, municipal refuse was seen as an urgent public health problem. It only made sense to provide for the prompt removal of

putrescible waste as a community service. This was one of the Progressive era reforms instituted to make life more bearable in the growing industrial cities of North America. Over time, the entrepreneurial rag and bone man was put out of business by uniformed municipal crews that hauled the community's refuse to an official disposal site.

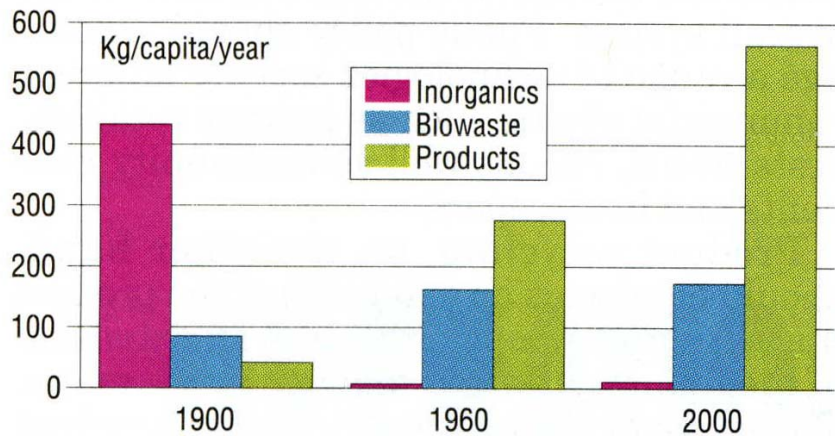
MSW AT THE CLOSE OF THE 20TH CENTURY

By the 1960s municipal solid waste was beginning to be viewed as an environmental problem as well as a threat to public health. Groundwater impacts from landfills and air pollution from waste incinerators were a continuing concern, but there was also a growing policy emphasis around resource conservation and materials recycling. In 1969 the National Environmental Policy Act made a commitment for the federal government to, among other things, "enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources."

In pursuit of this policy the U.S. Environmental Protection Agency (US EPA) produced annual reports characterizing the municipal solid waste in the United States. The reports, prepared by Franklin Associates, provide a series of snapshots of municipal waste going back to 1960. The reports divide municipal waste into two basic categories: products and other wastes. "Products" are manufactured goods and packaging - what was earlier called "rubbish." "Other wastes" are primarily food scraps and yard trimmings (called "garbage" in 1900) plus a now small amount of inorganic wastes (which would include the ashes in earlier times). This typology allows easy comparison with the waste surveys from the beginning of the 20th Century.

Figure 1 compares the per capita waste generation data from New York City at the beginning of the century with per capita waste generation data from US EPA in 1960 and in 2000. Most obvious are the disappearance of ashes (today classified as an industrial rather than a municipal waste) and the growth of product related waste. Note also that a new

Figure 1. Change in municipal solid waste composition; 1900 data for New York City, 1960 and 2000 data for U.S.



Sources: Melosi 1981; US EPA 2005

category of nonproduct waste emerged in the 20th Century - yard trimmings - reflecting the suburbanization of North America. We refer to the combined food scraps and yard trimmings as "biowastes."

Insignificant a century ago, products are now the largest category of municipal solid waste by far, comprising fully three-quarters of total waste by weight in 2000. Between 1960 and 2000, product waste generation more than tripled in total tonnage, from 54.6 to 176.3 million tons per year, while the generation of biowastes grew more slowly, at about the rate of population growth, from 33.5 to 57.7 million tons per year.

MUNICIPAL RECYCLING

In an effort to conserve resources, the municipal solid waste management system in North America was enhanced during the mid-1980s with the introduction of new municipal recycling services for certain recyclable products. Several years later, municipal programs were introduced to collect yard trimmings for composting. By 2001, the number of curbside recycling programs in the U.S. had reached 9,700 and the number of community composting programs had reached 3,227. What were the achievements of this expanded municipal infrastructure?

Figure 2 shows the recovery of product wastes and biowastes from 1980 to 2000, expressed as a percent of total generation of

each waste. The recovery of recyclable products (including packaging) experienced a surge in growth between 1985 and 1995 as municipalities took on responsibility for recycling collection, and then plateaued in the mid-1990s. Product recycling has been stalled at around 30 percent of product waste generated since 1995. USEPA has attributed this to increased product consumption which offsets the increases in recovery.

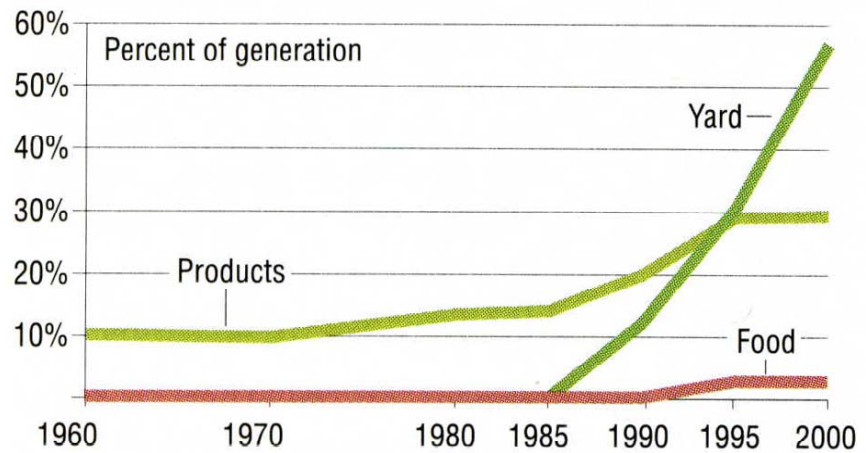
Recovery of yard trimmings was a significant success story of the 1990s. **Figure 2** shows that yard waste recovery was essentially nonexistent until the mid-1980s, but by 1995 had matched the 30 percent recycling rate for products and continued to expand, reaching a recovery rate of close to 57 percent. (This rate is well above the recycling rate for soft drink bottles (25.2 percent) and aluminum cans (43.9 percent). The only products with recovery rates higher than those achieved for yard trimmings are newspapers (82.4 percent) and corrugated boxes (71.3 percent), products that are similar to yard trimmings in that they occur in relatively high volume, homogeneous streams easy to manage in municipal packer trucks.)

Food scraps composting on the other hand is in its infancy, with less than 3 percent recovered for composting. As a result, food waste continues to go to landfills where it contributes to groundwater pollution and the formation of the greenhouse gas methane, 20 times more potent than carbon dioxide. Municipal landfills are the largest anthropogenic source of the GHG methane.

THE BOTTOM LINE: DISCARDS

A similar pattern is evident from materials sent to landfills and incinerators. What appears as a decrease in total MSW tonnage

Figure 2. Recovery of products wastes and biowastes (yard and food), as a percent of total generation of each waste

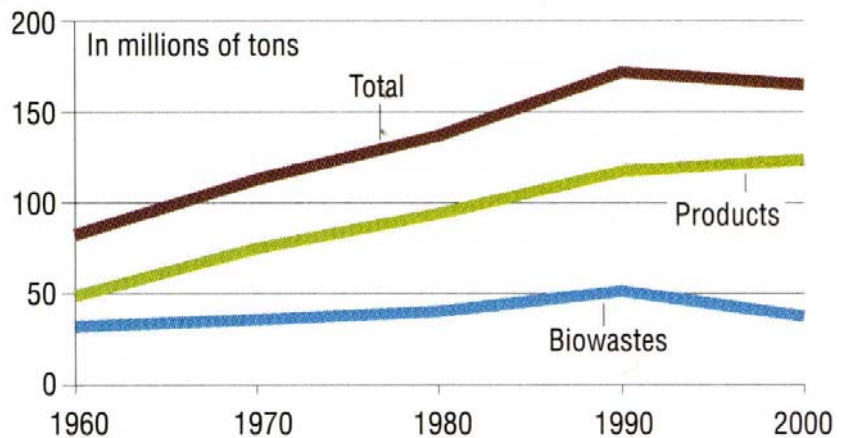


Sources: US EPA 2005; Franklin Associates, Ltd.

after 1990 is in fact due primarily to a reduction in biowastes (**Figure 3**). Product waste discards to landfills and incinerators continued to rise. Because of these trends, the proportion of products in landfills has increased, in comparison to biowastes.

Despite significant public investment, municipal waste management programs have not achieved our hoped for reduction in waste. Over two-thirds of municipal waste in the U.S. continues to be buried and burned.

Figure 3. Quantities of materials landfilled and incinerated at start of each decade



Source: US EPA 2005

THE FAILURE OF MSW MANAGEMENT FOR PRODUCT DISCARDS

As we have seen, the main driver in the growth of waste throughout the 20th Century has been product wastes. Despite efforts in recent years, our municipal solid waste management system has been unable to have an impact on consumption, which is driven by factors beyond community control.

In fact, the provision of universal collection and disposal of waste creates conditions that actually encourage the production and consumption of throwaway products. Throughout the 20th Century, local communities have provided convenient removal of any product that the householder had no more use for. This has acted as a perverse subsidy, encouraging production and consumption of short-lived products. In this way, cities and towns have been enablers of our growing addiction to convenience, facilitating the excessive material flows that characterize our consumer society and put humans in conflict with the environment. Municipal waste management has also been a form of corporate welfare for the companies that sell throw-away products, allowing them to win customers by promising "convenience" that is provided at public expense.

The municipal solid waste management system, originally configured to manage wastes made up of relatively homogeneous materials such as ash and biowastes, is entirely unsuited for managing today's complex consumer products. As a result, products with toxic components as well as those with valuable, highly engineered materials are collected in packer trucks and deposited en masse at landfills and waste incinerators. Even in municipal recycling programs, bulk handling degrades the value of the collected materials, with the result that as much as half of some collected materials such as glass ends up in landfills or low-value applications rather than replacing demand for raw materials.

Watching their recycling volumes level off and their overall waste generation continue to climb, municipal waste managers have started to shift their focus away from recycling. US EPA reports that the number of curbside recycling programs declined from 9,700 to 8,875 between 2001 and 2002. The municipal

waste management system is effectively conceding defeat in the goals established in the 1980s to stem material flows and conserve resources.

AN ALTERNATIVE APPROACH

The Product Policy Institute sees a clear message in these data: municipal waste policy should distinguish between product wastes and biowastes. Product wastes should be managed in a separate system, described below, rather than in the municipal waste system. The municipal waste management system should be focused around programs that provide biowaste management. This could be either through public facilities owned and operated by the community or through facilities owned and operated by the private sector or some combination of the two. Public policy should encourage organics processing facilities to emerge, scaled to serve local markets (minimizing hauling) and numerous enough to provide stability to the overall system. Public policy should encourage a range of technologies serving different commercial clients such as grocery retailers, restaurants, etc., as well as community residents and landscapers.

Product recycling, on the other hand, should be seen as an extension of the product marketing system, rather than an extension of the municipal waste management system. The recovery and recycling of a product should be managed through commercial arrangements made between the product brand owner and supply chain contractors. In this way, the product recycling process will mirror the production and distribution process.

POLICY SUPPORT FOR WASTE MANAGEMENT

The most immediate role for senior governments is to establish the policy and regulatory framework within which producers will take responsibility for the environmental management of their products. The legislative model developed in British Columbia (Canada) has been effective, providing the opportunity for brand owners to develop a program that suits their needs, while at the same time establishing clear environmental benchmarks and provisions for enforcement to prevent "free-riders" and protect the environment and public health and safety.

The regulatory process serves everyone best if regulations are harmonized, reflecting the highest common environmental and social standards as well as respecting the needs of companies that market products in a global marketplace. The European Union establishes "directives" that are implemented with legislation at the national level. Such a model might apply to trading partners within the North American Free Trade Agreement.

At the local level, biowaste processing should be supported with transitional policy

instruments such as differential disposal fees or outright bans on disposal, while product recycling services are supported through zoning and business licensing tools.

By separating the functions of product and biowaste management, this approach encourages innovation by producers to avoid waste, and also provides for the safe and beneficial use of community biowastes.

Helen Spiegelman and Bill Sheehan are President and Director, respectively, of the Athens Georgia-based Product Policy Institute. Spiegelman is based in Vancouver, British Columbia, and Sheehan in Athens, Georgia. The Product Policy Institute (www.productpolicy.org) is an independent nonprofit research and communications organization focusing on the link between production and consumption, on the one hand, and waste generation and disposal, on the other, in order to promote public policies that encourage more sustainable practices.

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