



Pay as you throw in the US: Implementation, impacts, and experience

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ARTICLE INFO

Article history:

Accepted 16 March 2008

Available online 15 October 2008

1. Introduction

“Pay as you throw” (PAYT) systems, also known as variable rates programs or user pay, ask households to pay more if they put out more garbage for collection. This simple concept – akin to paying a water or electricity bill – has been embraced by almost 7100 jurisdictions in the United States (Skumatz and Freeman, 2006a), and has led to the diversion of perhaps 6.5 million tons of municipal solid waste (MSW) per year (4.6–8.3 million) (Skumatz and Freeman, 2006a) that would otherwise have been land-filled. These tons are based on a combination of the tons diverted to recycling, composting, and source reduction. The research in this paper shows these programs are available to about 25% of the US population and about 26% of communities in the US – including 30% of the largest cities in the US. This paper provides a summary of research-to-date on a wide variety of issues related to PAYT systems in the US, including design, legislation, impacts, and implementation issues. The summary covers theoretical issues as well as practical findings associated with PAYT.

2. PAYT types, prevalence, and legislation in the US

In most parts of the US, garbage is removed once (or sometimes twice) a week, with revenues coming from one of two places:

- a portion of property taxes; or
- a fixed bill amount that does not vary with respect to the amount of garbage taken away.

Neither of these methods provides any incentives to reduce waste (Stavins, 1988; Skumatz and Breckinridge, 1990; Cornell, 2001). In fact, with the property tax method of payment, customers never even see a bill and generally have no idea how much it costs to remove their garbage regularly.

Over the last 20 years, a growing number of communities across North America have been adopting the user-pay principle used

commonly for water, electricity, and other services. User-pay, variable-rate pricing, or “pay as you throw” (PAYT) is a strategy in which customers are provided an economic signal to reduce the waste they throw away, because garbage bills increase with the volume or weight of waste they dispose. PAYT has been adopted in thousands of communities to create incentives for additional recycling and waste reduction in the residential sector.

PAYT programs are very flexible and have been implemented by communities in many forms – each designed around the basic principle that putting out less trash for collection should cost less. The most common types of PAYT programs in the US are can-based programs, bag programs, tag and sticker programs, and hybrid programs. Weight-based systems have been piloted in the US but never installed full-scale in any US communities for residential service, although this type of program is in place in Denmark, Germany, and other locations in Europe. Each program type as it exists in the US – can, bag, sticker/tag, hybrid, and weight-based – is briefly summarized as follows (Skumatz and Breckinridge, 1990):

- *Variable can or subscribed can:* In this program, customers select the appropriate number or size of containers (one can, two cans, etc., or 114–132 l (30–35 gal), 227–246 l (60–65 gal), etc.) for their standard weekly disposal amount. Rates for customers signed up for two- or three-can service are higher than rates for one-can customers. Some communities also have introduced 49–76 l (13–20 gal) mini-can or 38 l (10 gal) micro-can service levels to provide incentives for aggressive recyclers.
- *Bag program:* In this program, customers purchase bags imprinted with a particular city or hauler logo, and any waste they want collected must be put in the appropriately marked bags. Bags holding from 114 to 130 l (30–35 gal) are most common; some are smaller. Sales through community centers; or grocery and convenience stores are most common (sometimes with commission) and minimize inventory and invoicing issues. The bag cost incorporates the cost of the collection, transportation, and disposal of the waste in the bag. Some communities charge all costs in the bag price; others charge a separate customer charge to reduce risks in recovering fixed system costs.

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- **Tag or sticker programs:** These are almost identical to bag programs, except instead of a special bag, customers affix a special logo sticker or tag to the waste they want collected. The tags need to be visible to collection personnel to signal that the waste collection service has been paid for. Like the bag program, tags are usually valid for 114 l (30 gal) increments of service (Skumatz and Breckenridge, 1990; Corley and Dickerson, 2000). Pricing and distribution options are identical to bag programs.
- **Hybrid system:** This system is a hybrid of the current collection system and an incentive-based system. Instead of receiving unlimited collection for payment of the monthly fee or tax bill, the customer gets only a smaller, limited volume of service for the fee (typically 1 or 2 cans or bags). Disposal of extra bags/cans beyond the approved base service requires use of bags or stickers, as described above. This hybridized system is attractive to communities as it requires no change in the billing system, containers, or collection system, and the base service can be tailored to suit the community. Many customers see no change in bills; large disposers are provided an incentive to reduce (Skumatz, 1993b).
- **Weight-based system:** Called “garbage by the pound” (GBTP) in its earliest US test (Skumatz, 1989, 1991, 1994; Skumatz and Van Dusen, 1995), this system uses truck-based scales to weigh garbage containers and charge customers based on the actual mass (kg or lb) of garbage set out for disposal. On-board computers record weights by household, and customers are billed on this basis. Radio frequency (RF) tags are affixed to the containers to identify households associated with the can weight for billing. These programs have been pilot-tested in the US. Certified scale systems are available in the US; however, despite multiple pilot tests in North America, they are not in full-scale use in US or Canadian communities (except one community using this method of charging for commercial businesses). Another emerging trend is a variation on the weight-based system, called “RecycleBank™”. This option has shown promise in areas where PAYT has been hard to implement politically. Instead of weighing trash on-the-truck and charging by the weight of the garbage, the system weighs the recycling materials set out by the household and provides rewards and coupons at participating stores for putting out more recycling (up to a limit). This system can be implemented with or without one of the PAYT options and provides a recycling incentive, although it does not provide incentives for composting or waste prevention like PAYT.
- **Other variations:** Some communities or haulers offer PAYT as an option along with their standard unlimited system. Waste drop-off programs, charging by the bag or using punch cards or other customer tracking systems, are also in place in some communities, especially in rural areas.

Each system has strengths and weaknesses and, except for weight-based systems, are in place in many communities across the US and Canada. In addition, some systems are more appropriate than others, depending on local conditions. Based on a review of the inventory of US PAYT programs, we find that larger communities and urban and suburban communities tend to use can programs – especially if they have automated collection. Smaller communities and more rural communities are more likely to use bag, tag, or sticker programs. Bag and drop-off programs are most prevalent in the East, can and bag programs are most common in the Midwest and the South, and can programs are the most popular in the western US. The easiest form of PAYT to implement (and one that has become fairly common) is the hybrid system, which uses current collection and billing methods, but puts a cap on the amount of trash allowed for the fixed portion of the (tax or) bill.

Any additional set outs require extra fees – an incentive – through a bag, tag, or sticker system.

Volume-based incentives can theoretically help communities realize savings through reduced landfill usage; efficiencies in routing, staffing, and equipment; and higher levels of recycling. However, there are some disadvantages. Collection changes can lead to additional costs and new administrative burdens (monitoring and enforcement, billing, etc.), rate setting and revenues are more complex and uncertain, and significant expenditures for public education outreach are necessary for successful implementation of a PAYT program. Estimated impacts and the balance between pros and cons are addressed later in this paper.

2.1. Penetration of PAYT programs in the US

PAYT programs in the US have grown from about 100 in the late 1980s to about 1000 in 1993 (Skumatz, 1993a) to about 4150 in 1997 (Skumatz, 1997) to 5200 in 2001 (Skumatz, 2001a). The author conducted an inventory in 2006 (Skumatz and Freeman, 2006a), showing that PAYT is currently available to residents in almost 7100 jurisdictions across the US. Table 1 presents the count of communities with PAYT and share of total communities in each state that have PAYT available. The research indicates that these programs are now available in about one-fourth of the communities in the US (and are available to about 75 million persons, or about 25% of the US population). The states of Minnesota, Iowa, Wisconsin, California, New York, Washington, and Pennsylvania have the largest number of programs, each with more than 200 programs, some of which are mandated. States with the largest share of communities with PAYT available include: Minnesota, Washington, Oregon (all mandating or virtually mandating PAYT), followed by Wisconsin, New Hampshire, Massachusetts, Iowa, California, Michigan, and New York – all with PAYT available in 40% or more of the communities in the state. Wisconsin and New Hampshire had more than 75% of the communities with PAYT. Fig. 1 shows the prevalence of PAYT programs by state; of course, state populations and number of communities vary considerably. There has been a growth of almost 70% in PAYT communities in the last decade and six states that had no programs 10 years ago now have PAYT programs in place.

2.2. PAYT legislation in the US

The research also assessed the drivers for the implementation of PAYT. The key drivers for PAYT include: higher landfill fees (in early years driven by Subtitle D regulations promulgated by USEPA); examples of successful programs in other communities; state legislation; and other drivers. Although PAYT is generally implemented on a community-by-community basis, a number of states have felt the advantages were strong enough to encourage PAYT more formally. A number of US states – as well as counties and cities – have implemented state or local legislation or ordinances to require PAYT, under the following forms:

- **Mandatory:** all communities must implement PAYT (Minnesota has this system for all communities; Washington requires it of all certificated haulers).
- **Mandatory if goals are not met:** several states require communities that do not reach 25% or 50% diversion by other means to implement PAYT (Wisconsin and Iowa have used variations of this system).
- **Requirements to adopt a subset of menu strategies:** one state lists PAYT as one of a small menu of recommended strategies, and urban areas must implement more of the strategies on the list than rural areas (Oregon uses this approach).

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