

Bill Lascher
GEOG/PLUS 601
Sustainable Cities
Briefing Paper #3
12/4/08

Pay As You Throw and Municipal Solid Waste Reductions

Every day, the typical American produces about 4.6 pounds of waste.¹ According to the U.S. Environmental Protection Agency (EPA), municipal solid waste contributes to greenhouse gas emissions by increasing energy consumption both via transporting waste from homes and businesses to landfills and through producing, transporting and using goods before they are disposed of, by certain processes involved in production unrelated to energy production, and because anaerobic digestion of waste at landfills produces methane, a gas 21 times more powerful by weight than carbon dioxide at warming the atmosphere.^{2,3} Armed with this data, urban sustainability advocates interested in limiting cities' contribution to climate change may be interested in encouraging so-called “Pay-as-you-throw” waste management policies.

Pay-as-you-throw, or PAYT, changes the pricing policy for household solid waste. Traditionally, residents are charged flat fees for waste disposal, or pay for them as a portion of property taxes.⁴ Under a PAYT system, ratepayers pay for trash services based on the amount of garbage they throw away. Some programs issue varying sized (and priced) bins to participants; some require consumers to buy special bags for their waste at local store (trash collectors then only pick up these bags); some use specialized tags purchased in advance; some are hybrids of these measures, and a small number are technology-intensive weight-based systems in which the exact amount of waste a residence produces is measured.⁵

Although data cited later in this paper show some variation between each, all of these strategies have been shown to lower waste production in cities. Combined with industrial ecology techniques that produce goods with less material and encourage reuse of material flows, PAYT can contribute to waste reductions. In turn, smaller waste streams translate to reductions in greenhouse gas emissions associated with transportation and processing of solid waste.

The EPA promotes PAYT as a waste reduction tool for local governments. Data previously prepared for the agency show PAYT programs contribute to reduced greenhouse gas emissions. As of 2006, PAYT programs were available to 25 percent of the U.S. population in 7,100 communities and contributed to reductions of between 7.8-13.3 million metric tons of carbon dioxide equivalents each year and between 61 and 109 million MBTUs (million British thermal units) in annual energy usage.⁶

Lisa Skumatz, a solid waste management consultant and economist, has worked with numerous municipalities and states on PAYT legislation and ordinances. She conducted a series of studies which found that PAYT programs decreased residential municipal solid waste by 17 percent. 8-11 percent was diverted to recycling or yard-waste programs, the remaining six percent was achieved through reducing waste sources (i.e. packaging reductions and reduced consumption).⁷

These statistics are widely cited to justify PAYT programs. Environmentalists pursuing a zero-waste world, political leaders in large metropolises and free-market think tanks alike support PAYT as a waste reduction measure and a social equity measure (heavy wasters who therefore strain waste disposal systems more than other members of society are no longer

subsidized by those using the system less).

However, PAYT advocates acknowledge reducing household waste only addresses part of the problem of greenhouse gases associated with municipal solid waste. Residences only represent 40-60 percent of total municipal solid waste disposed⁸. Moreover, some complications exist for certain PAYT strategies in multi-family buildings. Skumatz and Freeman write it hasn't been widely tested in buildings with more than 8 units but argue it shouldn't be slowed because of this limited data.⁹

Some critics of PAYT also say the concept's intended effects might be negated by illegal dumping.¹⁰ Producers of excess waste might try to avoid higher bills by dumping their trash in another's dumpster or elsewhere, they argue. In the United Kingdom, where PAYT has gained little ground and is often referred to as a "bin tax," the Conservative minority has objected to Labour Party PAYT efforts on the claim they encourage so-called "fly tipping" (illegal dumping) and illegal burning of waste to limit the amounts thrown away.¹¹ While PAYT has taken off in the European Union and the United States, the U.K. prohibits local governments from charging for waste collection.¹²

An unlikely source this year dismissed criticism of PAYT and called the U.K. out for lagging behind on recycling efforts. "Waste, surprisingly enough, is uneconomic," wrote Gordon Hector of the Adam Smith Institute in his aptly-named "The Waste of Nations."¹³ There is data supporting Hector. Skumatz assigns a dollar value to reduced emissions associated with PAYT. Estimating prices for carbon dioxide equivalents based on late 2006 values of \$4 to \$4.15 per metric ton of carbon dioxide, Skumatz claims PAYT was responsible for \$30-55 billion in

savings nationwide.¹⁴

While the free-market, anti-tax themes of Hector's sponsor are evident in his report, he readily points out both cost savings and environmental benefits from PAYT. He also discounts “fly-tipping” arguments, writing that studies don't show any any links between PAYT and that practice. Hector also advances the argument that a strength of PAYT is the possibility it will increase industry innovation to limit resource usage in terms of packaging and manufacturing of goods in response to demand from consumers for products which lead to less waste.

One report regarding PAYT in Ireland isn't as committal. Appearing in a special section of the journal *Waste Management*, it suggests there isn't adequate data to claim fly-tipping has increased where PAYT exists, but does argue one reason it may seem so is increased reporting, fines and public awareness. The Irish report does say backyard waste burning has increased but suggests that may be a larger issue in rural areas not served by waste collectors of any sort. Again, there isn't adequate data about waste burning.¹⁵ Still, the problem of people illegally burning waste is at least worthy of awareness because of associated health and environmental risks.

Returning to Hector of the Adam Smith Institute, his market-based response to critiques of PAYT doesn't quite ensure environmental benefits, although he does see the association between environmental and economic sustainability. From Hector's perspective, consumers are the best standard-bearers of the environmental movement. They will demand less packaging and more recycled materials. They will also be more likely to participate in PAYT if competition is allowed to thrive between private waste haulers, on the idea that they will compete to lower

waste collection fees.

The problem with this argument is that while increased recyclables and lowered packaging might limit the amount of material heading to landfills, this logic doesn't address the broader problem of a consumerist society. Less packaging doesn't mean less product. It doesn't address consumption rates, and therefore the environmental strain and climate change impact of greenhouse gas emissions associated with production and transportation of products to consumers isn't lessened unless the message consumers send to producers is “We want less stuff.” Likewise, if waste haulers compete to lower collection fees consumers may feel they can “afford” to throw more away and increase their waste production.

Residents' acceptance and participation in PAYT programs determine their effectiveness. In the *Waste Management* issue devoted to PAYT, German scholar Bernd Bilitewski acknowledges the potential of PAYT but takes a pragmatic approach. He suggests that the most effective PAYT programs need some sort of standard base rate, both to pay for “certain fixed costs for the provision of waste services” and to minimize “the temptation to bypass the system.”¹⁶ In other words, to discourage illegal dumping or any sort of fixing of PAYT programs, for example with black market tags.

Case studies elsewhere suggest economic savings to both municipalities and citizens as long as certain actions are taken to ensure compliance with PAYT (such as enforcement of illegal dumping laws, sustained incentives, and communication with citizens). A team of Greek and American engineers examined the four main PAYT strategies mentioned earlier as implemented in the municipality of Panorama in Greece, which has a population of just over 20,000 people.

The researchers found bag-based PAYT schemes tend to incentivize waste reduction the most, and consequently lower household waste costs.¹⁷ This is an important factor to note, but the study's authors note they only studied the financial aspect of PAYT and not its environmental impact. For the purposes of this paper, though, since the study shows reductions in waste streams it does suggest PAYT can measurably lower the environmental impact of landfilling.

Skumatz's model of PAYT programs says the best such policies embed recycling costs into waste collection fees, limit the size of the smallest container option for waste consumers at 32 gallons, offer incentives through rate differentials, and require reporting from waste haulers of disposed and recycled tonnages.¹⁸ While communities using PAYT in conjunction with composting or recycling programs report between 25 and 45 percent reductions in tonnage going to waste disposal facilities, Skumatz writes that the reductions can't be completely attributed to PAYT.¹⁹

Municipalities and other regulatory entities must consider environmental and economic justice when taking steps to combat climate change. Emissions reductions measures mustn't simply shift the impact of pollutants from one community to another, particularly because climate change has global consequences. Moreover, the burden for achieving necessary reductions must be shared equitably. When PAYT programs are implemented, for example, policymakers should ensure that less waste-prone products (i.e. products with less packaging that are more durable and easily recyclable and reusable) are affordable and accessible to residents in lower-income communities. Options that limit waste are necessary for consumers to avoid spending more on waste production in a PAYT system. Municipalities must also clearly

communicate that residents' participation in PAYT won't cost them more than flat rate disposal.

As Batllell and Hanf point out, the effectiveness of PAYT doesn't just require effective technology, cost analyses or waste reduction data from past case studies. PAYT requires a perception among residents that it is a fair system or else they will not participate as readily. Responsibilities and costs should be allocated fairly, Batllell and Hanf argue. In other words, policymakers have to ensure that producers take responsibility for what they produce so consumers aren't forced to pay more for increased waste.²⁰

The perception challenge is important. Even if residents are charged for traditional waste collection through property taxes or flat fees, they may not recognize they're paying for the service whereas they are acutely aware when paying for PAYT collection. One retired Stanford trash archaeologist was quoted by *The Wall Street Journal* in July, 2008 explaining the perception among most Americans that garbage service is a right similar to police protection: "If you get burglarized, you don't pay extra. Garbage service became like a human right, because it was to protect you."²¹ As the article describes, political concerns and fears can delay implementation of PAYT and even stop it.

Other entities have also recognized the importance of perceived costs to participation. As the California Integrated Waste Management Board (CIWMB) points out "Residents who have lower incomes may shy away from recycling if they believe the recycling costs them money (Especially true for PAYT programs)."²² The problem is compounded if residents believe cities make money off recycled materials or if they do not have access to outreach materials describing recycling options, whether through improperly translated materials or a lack of subscriptions to

local newspapers or other media. Solutions to these problems identified by the CIWMB included multilingual outreach materials and waste auditors and efforts targeting managers of multifamily apartment buildings intended to reach those residents in rental units who might not otherwise be fully aware of their recycling options.²³

When it comes to PAYT costs and lower income communities, the CIWMB recommends options such as reduced rates, assistance similar to that provided for other utilities, bill credits and other materials. This assistance should be well defined and structured and use broadly recognized standards for identifying low income qualifications.²⁴ Importantly, as Hector, of the Adam Smith Institute notes, the U.K.'s Local Government Association reported that PAYT programs in Holland, Germany and Ireland cost households nearly the same amount each year as the U.K.'s flat rate collections; Moreover, that data also valued net economic gains in Spain and Germany due to reduced emissions associated with PAYT.²⁵

At the time of this writing the City of Los Angeles Bureau of Sanitation was preparing pilot routes for a PAYT program for municipal waste in that city.²⁶ Nicole Bernson — the senior policy advisor to Councilmember Greig Smith, one of two Los Angeles City Councilmembers who sponsored an amendment to the city's Budget in July, 2008²⁷ creating this program — characterized the existing flat fee for waste collection as “unfair” to people making an effort to recycle more or reduce their waste. In each of the city's six “waste sheds,” Bernson said, private waste haulers are collecting data about disposal to determine rates. The PAYT effort is part of Smith's broader “RENEW LA” program, which includes a goal of reducing landfilling altogether, Bernson said, and will address environmental justice concerns by shifting waste

disposal from a single landfill to disposal sites within each waste shed. That measure should limit dioxin leaching and soil contamination as well as methane production at that landfill. It will also cut carbon dioxide emissions associated with waste transportation by lessening the distance traveled from waste collection routes to disposal sites.

Cities interested in cutting their greenhouse gas emissions and thus their contribution to global climate change may find themselves taking an approach similar to that under review in Los Angeles right now. In the U.S. as elsewhere, policymakers will need to draw the connection between greenhouse gas reductions associated with waste reduction to economic savings. Pay-as-you-throw waste collection policies can have measurable greenhouse gas emission reductions in urban areas. They can also lower expenditures on waste collection and disposal for municipalities and costs (such as fuel) for waste haulers. Financial benefits can also be felt by residents who choose to produce less waste, thus further decreasing climate-related impacts from that waste. Political leaders may be loathe to take any measure that appear to burden households with additional costs, so proponents of PAYT programs will need to ensure the benefits of such programs are well communicated.

- 1 U.S. Environmental Protection Agency. Planning for a Sustainable Future: A guide for Local Governments. Nov. 2008. Accessed 29 Nov. 2008 at <www.epa.gov/region2/sustainability/greencommunities> . p. 29
- 2 U.S. Environmental Protection Agency. A life-cycle Assessment of Emissions and Sinks. 2nd Edition. May 2002. p. ES-3
- 3 U.S. Environmental Protection Agency. "Methane." Web page located at <<http://www.epa.gov/methane/scientific.html>>. Last updated 19 Oct. 2006. Accessed 28 Nov. 2008.
- 4 Skumatz, Lisa A. & Freeman, David J. Pay As You Throw (PAYT) in the US: 2006 Update and Analysis. Prepared for US EPA and SERA, by Skumatz Economic Research Associates, Superior CO. p. 2.
- 5 *Ibid*, p. 3.
- 6 *Ibid*, p. 1
- 7 *Ibid*, p. 7
- 8 *Ibid*. p. 13
- 9 *Ibid*. p. 15
- 10 Among many American and foreign news accounts on the matter see Downs, Andreae, "Budget crunch revives pay-to-trash idea. The Boston Globe. 6 July 2008. Accessed 2 Dec. 2008 at <http://www.boston.com/news/local/massachusetts/articles/2008/07/06/budget_crunch_revives_pay_to_throw_trash_idea/>.
- 11 Jacobs, Tom, "The Coming Scofflaw Problem: Fly Tipping," in "Monkey See, Monkey Brew," Web log post hosted at Miller-McCune. Posted 8 Oct. 2008, 12:19 PM. Accessed 3 Dec. 2008 at <<http://www.miller-mccune.com/article/monkey-see-monkey-brew>>
- 12 Hector, Gordon. The Waste of Nations. ASI (Research) Ltd. 2007. p. 7
- 13 Hector, p. 5
- 14 Skumatz & Freeman, p. 9
- 15 Dunne, Louise; Convery, Frank J. and Gallagher, Louise. "An investigation into waste charges in Ireland, with emphasis on public acceptability." Waste Management. Vol. 28. Dec. 2008. Elsevier Ltd. p. 2831
- 16 Bilitewski, Bernd. "From traditional to modern fee systems." Waste Management. Vol. 28. Dec. 2008. Elsevier Ltd. p. 2760
- 17 Karagiannidis, Avraam, Xirogiannopoulou, Anna and Tchobanoglous, George. "Full cost accounting as a tool for the financial assessment of Pay-As-You-Throw schemes: A case study for the Panaroma Municipality, Greece. Waste Management. Vol. 28. Dec. 2008. Elsevier Ltd. p. 2808
- 18 Skumatz, Lisa A. Model Pay As You Throw (PAYT)/Variable Rates (VR) Legislation: Elements, Options and Considerations for State or Local Level Legislation in Solid Waste. Prepared by Skumatz Economic Research Associates, Inc. Superior, CO. 2008. Accessed 3 Dec. 2008 at <http://www.paytwest.org/pdf-files/paytlegislationSERA_012908.pdf>.
- 19 *Ibid*, p. 2
- 20 Battlevell, Marta & Hanf, Kenneth. "The Fairness of PAYT systems: Some guidelines for decision-makers." Waste Management. Vol. 28. Dec. 2008. Elsevier Ltd. p. 2793-4.
- 21 Tomsho, Robert. "Kicking the Cans." The Wall Street Journal. 29 July 2008. Accessed online 3 Dec. 2008 at <<http://online.wsj.com/article/SB121729506485991917.html>>.
- 22 Jackson, Mark. "Serving Diverse Populations With Recycling: A Model for Local Government Recycling and Waste Reduction." Prepared by the Institute for Local Self-Reliance for the California Integrated Waste Management Board. July 2002. Accessed 3 Dec. 2008 at <<http://www.ciwmb.ca.gov/publications/localasst/31002013.pdf>>. p. 1
- 23 *Ibid*, p. 3-5.
- 24 *Ibid*, p. 6.
- 25 Hector, Gordon, p. 16.
- 26 Telephone Conversation with Nicole Bernson, Senior Policy Advisor, Los Angeles City Councilmember Greig Smith, 3 Dec. 2008.
- 27 The other was City Council Member Bill Rosendahl