RECYCLING AND CLIMATE CHANGE:

Getting GHG Reductions Fast & Cheap – Why PAYT Should be One of the First Programs for "Sustainable Cities"

…Using Recycling as a "Bridge" While Energy Efficiency Programs Ramp Up[1]

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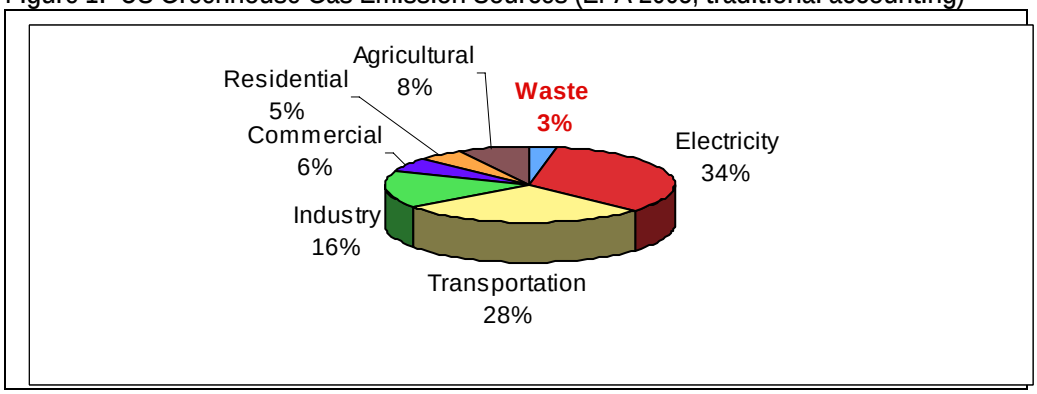
Jurisdictions across the US are adopting "green" or sustainability goals, and implementing wide-ranging strategies to move toward those goals. Given the traditional information from EPA on the sources of greenhouse gas (GHG) emissions (which indicates waste management contributes only about 3% of GHG emission sources), communities are focusing on energy-related issues, and mainly building energy use and transportation, which appear to represent much bigger sources of emissions. However, recent work shows that this standard analysis would lead to a slower, weaker, and more expensive strategy to GHG reductions. Recycling and PAYT (Pay as you Throw)[2] programs should be included as "early hit" strategies.

Figure 1: US Greenhouse Gas Emission Sources (EPA 2005, traditional accounting)



What is PAYT? How does it Relate to GHG? PAYT is an incentive fee system that puts trash on the same "utility" basis as electricity, water, and other services… if you use more service you pay more. Households in a PAYT town pay more for bigger trash cans (or more bags) of trash service, and those recycling more and using small trash cans (or fewer bags) get to pay lower bills. Behavior and bill are now closely linked - like your electricity bill. Through PAYT, you are encouraged to reduce through recycling, composting, and giving to Goodwill, and reducing your trash! PAYT doubles recycling, and reduces trash volumes by 1/5 or 1/6.[3] Non-PAYT cities – where trash is basically an "all you can eat (or dispose) buffet for a fixed price" – leads to significant waste, less recycling, and greater GHG production than communities with PAYT.[3] wasteful More trash in the landfill causes creation of more methane, and methane is a GHG that is 23 times more potent in the atmosphere than carbon dioxide.[4]

Recycling / PAYT programs are more cost-effective in reducing GHG*: Based on an analysis of the costs per metric ton of carbon dioxide equivalent (MTCO2E) of GHG emissions avoided, our analysis indicates that* ***faster and cheaper progress in reducing GHG*** *could be made if communities include in their plans an early focus on solid waste programs. Figure 2 shows the relative costs per metric ton of CO2 emission avoided. The chart shows that recycling and waste management programs are cheaper per MTCO2e than any of the energy efficiency (EE) programs modeled. Pay as you Throw is the cheapest strategy of any program modeled, and is one-ninth the cost of achieving similar GHG reductions from residential weatherization programs – those funded very commonly by the ARRA stimulus package.*

Recycling / PAYT programs provide comparable job creation / economic development as Energy programs*: Figure 3 shows the relative job creation performance of the recycling and energy efficiency programs. The figure shows that the job creation per million program dollars spent are comparable or higher for recycling programs than for the energy efficiency programs.*[5]

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Most importantly, solid waste programs bring five other policy advantages:[6]

- ***Faster to implement***: *With an ordinance (the "stroke of a pen") or contract (hauler implementation), or municipal implementation, community-wide PAYT or recycling can be implemented within months. Weatherization programs take most of a year just for training, advertisement, verification, roll-out, and audits, before any measures are installed.*
- ***Better Household Coverage***: *All households within a community are covered immediately with a PAYT or recycling program. On the energy side, as an example, the National Weatherization Assistance Program covers 150,000 households per year, or about 3,000 per state on average. Implementing PAYT or recycling in even one small town gives many more households the opportunity to participate and reduce GHG than energy programs.*
- ***Authority:*** *Few communities and counties have municipal electric or gas utilities. Thus, they have virtually no power over the implementation of energy efficiency programs – power that rests with the utilities or regulators. However, they have considerable authority over recycling and waste management, and can get programs implemented directly by ordinance, contract, districting, municipalization, or other strategies. And of course, the state has considerable authority to require programs, as many states across the US have done.*[7]
- ***Retention***: *Energy programs have lifetimes of 3-25 years, depending on the measures installed. PAYT's financial incentives have very good retention of behavior change; recycling programs implemented decades ago are still in operation and provide strong recycling.*
- ***Minimal Cost Out of Pocket***: *PAYT is basically "free" for towns to implement. PAYT and recycling programs are paid by the beneficiaries – the households receiving the programs pay the bills. Unlike the relatively high cost of weatherization and other programs, the waste management programs do not require significant city / community / county funds – they are user-pay through the trash bills.*[8]

So what is the Hold-up? In two words… ***Political will***, or perhaps it is the political courage to change.[9] There are no significant technical issues with PAYT. PAYT is in place in communities large and small, urban / suburban / rural, with one / multiple private haulers, with municipal collection, island / tourist / college communities, manual and automated collection, communities with drop-off recycling only and those with curbside, and every other combination. PAYT Is really quite straightforward to implement – and the problems or challenges[10] are always bigger fears that reality according to the 7,100 communities[11] that have implemented the program nationwide. SERA's latest counts show that thirty of the largest 100 communities[12] in the US have PAYT; thousands of medium and small ones have the program.[13] Several states mandate PAYT for all communities in the State.[14]

Conclusion: *Governments – federal, state, county, or local – that are interested in reducing GHG or talking "sustainability"*[15] *should implement recycling and waste management programs along with energy efficiency and other strategies. These programs achieve reductions more quickly and cheaply and provide an effective bridge as energy efficiency programs ramp up. Recycling / Waste Management needs to be at the table when developing GHG program portfolios, and should be considered similarly and strongly eligible for stimulus dollars.*

Figure 2: Relative Cost [16]per Metric Ton Carbon Emissions[17]
Source: Skumatz Economic Research Associates, Superior CO 2009

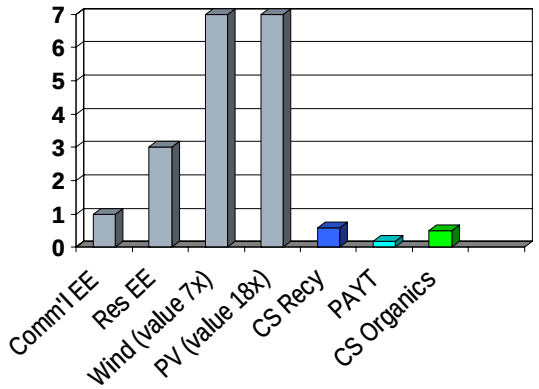
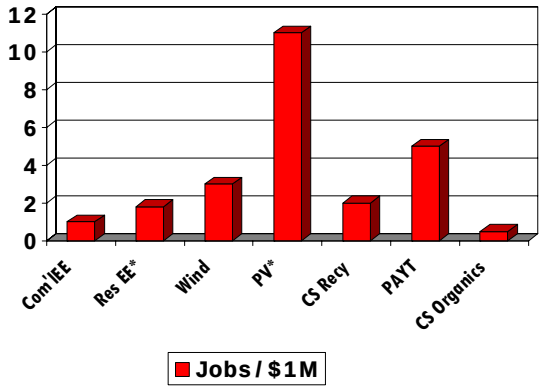


Figure 3: Relative Job Creation for Dollars of Program Investment[18]
Source: Skumatz Economic Research Associates, Superior, CO 2009[19]



[1] Source: updated from Skumatz, Lisa A., *Recycling and Climate Change: Finding the "Biggest Bang" Community Strategies for Reducing GHG", Skumatz Economic Research Associates, Superior CO, 4/2007, updated 2008, 2009; Excerpts published under same title in *Resource Recycling*, 10/2008.

[2] Households putting out more trash or bigger trash bins (and recycling less) pay higher trash bills than those putting out less trash. It treats trash as a "utility" like electricity, etc. Those using more pay more. The system is in place in 7,100 communities across the US (Skumatz, 2008, "PAYT in the US: Implementation, Impacts, and Experience", *Waste Management*, Elselvier Publications).

[3] Op. cit. and many other SERA publications. The estimated figure is 17% less trash, with 1/3 to recycling, 1/3 to organics, and 1/3 to "source reduction" or buying carefully / donating, etc. .PAYT leads to twice as much tonnage recycled as non-PAYT towns. In studies assessing 20 different strategies to increase recycling, PAYT was the most effective option. (Source: Skumatz, Lisa A., "Beyond Case Studies: Quantitative effects of recycling and variable rates programs", *Resource Recycling*, September 1996, and Skumatz, "Achieving 50 Percent Recycling: Program elements, analysis and policy implications", *Resource Recycling*, September, 1999.

[4] And the recycling that is encouraged by PAYT has significant embedded energy, and saving that energy by recycling leads to significant GHG reductions. As a very simple example, recall that recycling an aluminum can saves 95% of the energy used to mine / process that can. In addition, the methane is front'-loaded in the first 20 years, and the carbon measures are usually spread over 100 years. The creation of methane (in a landfill) is thus, even more important to avoid.

[5] Source: Skumatz, Lisa A. *Do Energy Efficiency Strategies Outperform Recycling in GHG Mitigation and Job Creation?", Proceedings for the IEPEC Conference, 2009, Portland, OR. Also presented at Western Economics International Association Conference, 2009. The results are based on an analysis of seven specific programs modeled, including: Commercial energy efficiency (EE) using a standard commercial lighting retrofit program. Residential EE is modeled using a typical residential weatherization program. PV means photovoltaic or solar. Wind is self-explanatory. The waste management programs modeled were Pay as you Throw (PAYT), residential curbside recycling, and residential curbside organics collection.

[6] There is one additional important benefit. New Accounting: EPA has caught up, and now looks at GHG in a revised way. They now look at what goes into a landfill as the end product of the energy and resources it took to produce, transport, and consume the goods and materials that ultimately get disposed in the landfill. Under this new accounting system, waste management is no longer a paltry 3% of the source of emissions, but instead is the single largest source – at about 38%. This is larger than energy sources. The revised (EPA 2008 draft) pie chart sectors are: Building energy use 31%; Intercity passenger transport 7%; local passenger transport 12%; food 12%, and "provision of goods and materials 38%.. This last figure represents the embedded energy and emission of what ultimately goes into a landfill.

[7] Including mandates for recycling (or certain recyclables), bans on recycling in the landfill, and requirements for communities to implement PAYT. (Skumatz and Freeman, 2006, "Roadmap for Colorado…", for Colorado CDPHE, Denver CO).

[8] And from a hauler's point of view, recycling and PAYT are business opportunities. Under the new system, haulers are *required* by the community to provide more services (trash *and* recycling), and are reimbursed for those efforts.

[9] Of course, some towns may not have heard of PAYT… but for those that have, political will – and a political "champion" is the key. And to be fair, the energy industry is more concentrated and has been much more organized in getting the word out on energy programs. Those looking briefly at the traditional accounting of GHG sources by EPA (Figure 1) may also have assumed there was not much point in focusing on solid waste programs. See Footnote 6 for an illuminating update on this pie chart. And PAYT is not common in some states, so the chance to learn from neighboring communities or from outreach may be low.

[10] The concerns that usually arise first in conversations about PAYT are: 1) illegal dumping; 2) equity/ unfair to large or poor families; and 3) cost and workload. The responses follow: 1) there is no statistical or demonstrated increase in illegal dumping in 75% of communities implementing PAYT, and the ¼ that see an increase report it lasts 3 months (SERA, 1994, 2004). The largest component is bulky items and appliances, so a successful PAYT program needs a bulky waste tag. 2) Turn the question around. Hasn't it been unfair all these years for low disposers (think of fixed income elderly households that recycle a lot) to be subsidizing wasteful disposers and large families all these years. With PAYT people pay an amount that varies with their behavior – trash less or recycle more and you pay less. 3) Two states (WI and IA) conducted surveys of communities that put in PAYT and found that for 2/3 the new systems (and household bills) were the same or lower; 1/3 saw increases. All expected the long run costs to be lower and that is part of why they put in the systems. In a study conducting surveys with nearly 1,000 PAYT towns, SERA found that in every case, fear of problems was much larger than the reality.

[11] Skumatz, Lisa A., Ph.D. and D. Juri Freeman, "PAYT in the US: 2006 Update and Analyses", prepared for USEPA by Skumatz Economic Research Associates, Inc., Superior CO, 12/2006.

[12] Including at least 10 US communities with population of 500,000 or more (Source: Skumatz / SERA).

[13] Op. cit.

[14] This has been very effective, and PAYT has been cited as a "driver" in moving recycling forward in the state. (Source: SERA for CDPHE cited earlier). States requiring PAYT (with variations) include WA, MN, IA, OR (Source: Skumatz, "Model Variable Rates / PAYT Legislation…", Skumatz Economic Research Associates, Inc. 1995, revised 2001.).

[15] All the leading sustainability communities in the US have PAYT – San Jose, Seattle, Portland, San Francisco, Berkeley, Boulder, and others. Fort Collins undertook an assortment of energy, transportation, and solid waste / recycling programs. Their first five-year evaluation found that the largest contributor to their GHG progress came from the recycling / PAYT efforts. Skumatz and Gordon, "Beyond Success: Taking the next step towards 50 percent" (Fort Collins), *Resource Recycling*, November 2006.

[16] Costs are shown relative to the cost for delivering MTCO2e from a commercial lighting program.

[17] Programs analyzed include, in order: commercial energy efficiency (EE) lighting program; residential weatherization, wind generation, solar photovoltaics, curbside recycling, Pay as you throw, and curbside yard waste / organics. The figures for curbside yard waste (YW) / organics have greater uncertainty than the other programs due to EPA model issues. Note that the amount of direct GHG from landfills will likely be less than the ultimate savings from energy efficiency programs; however, new EPA accounting that considers the "upstream" embedded energy elements of "production / consumption of materials" that end up in landfills finds that, instead of a 3% contribution from waste management, the figure is more like 36%, and the contribution to emissions is larger than for energy efficiency. (EPA 2009).

[18] Asterisk on PV program job creation – numbers in the literature are quite variable.

[19] ***About the Author***: *Lisa A. Skumatz is an economist with 30 years of experience in resource program evaluation. She is Principal of Skumatz Economic Research Associates (SERA), a 5-person niche research and consulting firm established in 1994, with offices in Superior, CO and Orcas, WA. SERA conducts research in waste management programs for cities / counties / states / federal government, and evaluates energy efficiency strategies for utilities and regulators. Dr. Skumatz has more than 70 publications in energy efficiency conference proceedings and journals, and more than 60 publications in solid waste trade and refereed journals. Dr. Skumatz has won two national lifetime achievement awards for her work in resource economics – from the National Recycling Coalition and from the International Solid Waste Association of North America. SERA conducts work across North America and internationally, and Dr. Skumatz has presented research and keynoted at more than 150 conferences in the US and overseas. She has served on the Board for associations and non-profits in both energy and recycling at the local, state, and national level. She is an acknowledged expert on PAYT, and she and SERA have conducted more original research and produced more publications on the topic of PAYT than any other firm or person in the world. SERA has assisted numerous communities on PAYT, and has given more than 100 workshops on the topic. See www.paytwest.org; www.paytinfo.com ; www.payt.org for more information on the topic. Her work on PAYT has been used or cited in technical documents as well as popular press including New York Times, Wall Street Journal, the Sunday paper magazine "Parade", Consumer Reports, and she has appeared on "Good Morning America", Fox Business Network, and other media. In the civic arena, she is also Mayor Pro-Tem of Superior Colorado. This policy summary represents key findings from Phase 1 of the research project. She previously worked for the federal government (Bureau of Labor Statistics, DHHS, and DOE's Pacific Northwest Laboratories); cities (Seattle Public Utilities/Solid Waste), private (Pacific Gas and Electric Company, and Synergic Resources Corporation / consultants), and non-profit (Nader's Public Interest Research Group) sectors.*

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