TECHNICAL REPORT

An Analysis of Tax Credits for Landfill Gas Energy Recovery

Contents

Prepared by
Peter Anderson, President
RECYCLEWORLDS CONSULTING
Madison, Wisconsin
(608) 231-1100
http://www.recycleworlds.org

September 2001

GrassRoots Recycling Network
P.O. Box 49283, Athens, GA 30604-9283 ◆ Email: zerowaste@grrn.org
Tel: 706-613-7121 ◆ Fax: 706-613-7123 ◆ Website: http://www.grrn.org

Introduction

Arguments made in support of energy recovery of landfill gas are predicated upon the environmental benefits that are gained when electric production elsewhere is displaced. When landfill gas is productively used to power generating units, instead of just flaring the collected gas, greenhouse gases are reduced.

While that factor is correct, the statement fails to disclose other far more critical considerations. These relate to the very small amount of gases that are actually collected; to major infirmities in the design and operation of landfills, even when they are built to current standards; to weaknesses in proposed across-the-board type tax credits proposed to encourage energy recovery; and to the fact that subsidizing landfills precludes alternatives that can solve the problem.

This technical paper is an effort to provide a more complete picture from which more informed conclusions can be drawn. Otherwise, counterproductive results can be expected from the grossly oversimplified consideration currently accorded this complex issue.

I
Most Landfill Gas is Not Captured

Most of the methane emitted by landfills is never captured due to inherent inefficiencies of collection systems. Although no field data exists, landfill operators, themselves, typically do not claim that more than 50% is actually extracted in collection pipes, and the reality over time is that far less than half is really captured.

One of the reasons why landfill gas extraction systems are so inefficient is that the vertical collection pipe that pull some of the gas from the landfill with a vacuum pump cannot properly be perforated to draw gas into the line at the top **a** to ½ of the tube. Otherwise oxygen might also be pulled from the surface that would be explosive when mixed with methane. Nor can the pipes be drilled to the bottom of the waste load or the pipe will penetrate the bottle liner when the waste load decomposes and subsides.[1] These factors significantly limit the draw at the top and bottom of the landfill.

In addition, variation in waste densities and barriers to gas flow in a landfill from plastic garbage bags and other impediments makes it difficult to uniformly draw the gas that aggregates in pools unless the pipe happens to have, by chance, been drilled directly adjacent to a gas pool. Similarity, pools of leachate that can be found perched high in the waste load can flood the pipes, and the gravel pack surrounding pipes can become plugged.

[1] William Robinson, *The Solid Waste Handbook: A Practical Guide* (1986), at p 317.

An even greater set of operating limitations is not reflected in the 50% estimates. Often gas collection systems are not installed for 7-10 years after waste emplacement begins. By that time, almost half of the *first* wave of gas has been generated and emitted uncontrolled into the atmosphere. Moreover, far more than half of the total gas generated by today's landfills will occur in a *second* wave of gas generation decades in the future after the end of the mandated post-closure period when the landfill cover will fail and rainfall enters the site.[2] By that time, the gas collection systems will have been removed from service and all gas releases will be uncontrolled.[3]

Lastly, it should be noted that EPA rules mandating the installation of gas collection systems only covered 54% of the waste in the ground in 2000, the rest being at sites which were closed before the effective date of the air regulations for landfills, or are in landfills smaller than the threshold for coverage set by the rules.[4]

While hard data unfortunately do not exist, a claim that much more than 10% of all the landfill gas actually gets captured is difficult to sustain when all these limitations are combined.[5]

Moreover, this is all before one factors in a tradeoff that is an unintended side effect of well-meaning efforts to encourage energy production. For efforts to increase energy recovery will also lead landfill operators to modify their practices in ways that will cause –

- More methane being discharged into the global atmosphere, and

- Greater emission impacts on people living next to the landfill.

For one thing, the efficiency of gas destruction in internal combustion engines for electricity is 10% less than flaring.[6] For another, if a landfill operator is offered a financial inducement to manage his site for power, the operator will tend to shift the way he or she manages gas collection to run the generating units at higher utilization. He will do this by concentrating the vacuum forces at the center of

2 53 FED. REG. 168, at pp. 33344-33345 (August 30, 1988).

3 40 CFR Part 60.752 (b)(2). G..Fred Lee and Ann Jones-Lee, A., "Unreliability of Predicting Landfill Gas Production Rates and Duration for Closed Subtitle D MSW Landfills," Report of G. Fred Lee & Associates, El Macero, CA (September 1999).

4 EPA, *U.S. Methane Emissions 1990-2020: Inventories, Projections and Opportunities for Reductions* (1999); *Life-Cycle Inventory and Cost Model for Waste Disposal in Traditional, Bioreactor, and Ash Landfills* (1999), at p. 108.

5 Calculated as 50% × <50% × 54%.

6 EPA, *Life-Cycle Inventory and Cost Model for Waste Disposal in Traditional, Bioreactor, and Ash Landfills* (1999), at 6.4.1.

the site where gas production is densest. But this necessarily will be at the expense of the vacuum pressures left to reach the landfill's periphery. Consequently, the proportion of gases, including the hazardous non-methane compounds, released at the boundary of the site nearest to the landfill's neighbors will increase when a site is managed for energy recovery.

Similarly, in a further effort to run the generating units at higher efficiencies, there will be an incentive to shift from dry to wet conditions. Landfills in which water is deliberately introduced to accelerate the rate of decomposition will produce more gas in less time. That works in conjunction with the other strategy of focusing gas collection in those parts of the landfill where gas generation is greatest. However, accelerating decomposition will significantly increase uneven subsidence in the waste load. Since wet cell operations tend to use flexible horizontal piping to collect gas, that subsidence can be expected to cause the lines to sag, and trap water at those dips, further impeding collection efficiency to a greater extent than more stable dry cell operations using rigid vertical pipes.

The bottom line is that almost all of the gases by landfilling organics are released unabated into the atmosphere – regardless of how many landfills install power producing equipment on top of their gas wells.

Landfills' true contribution to global warming is not the 4% of U.S. manmade greenhouse gases estimated by the EPA when assuming, without any technical support, a 75% gas capture efficiency in those landfills that have extraction equipment.[7] Landfills may actually contribute between 10% and 15% of America's anthropogenic climate change gases when field data is finally gathered.[8] The enormity of this number is so great as to demand concerted efforts to eliminate the source of the gases in the first instance.

Of equal but little recognized concern is the fact that the methane extracted from landfill gas is not the relatively clean form of fuel we know as natural gas. Because of the toxic constituents in our trash, landfill gas also contains carcinogenic volatile organic compounds such as benzene, toluene, xylenes, carbon tetrachloride and others.[9]

Moreover, microbes responsible for anaerobic decomposition converts elemental mercury in discarded batteries and ballasts into its di-methylated form that is a lethal nerve gas, and may cause

---

7 EPA, *Global Warming: National Emissions* (2001), at Table ES-1.

8 EPA estimates that landfills in the U.S. contribute 4% to manmade climate change gases when, among other questionable assumptions, 75% of the gas it estimates is generated gets captured at those landfills with gas extraction systems. If the actual capture efficiency is actually somewhere between 10%-25%, this suggests that the corrected landfill contribution to climate change would be in the 10-15% range.

9 EPA, *Life-Cycle Inventory and Cost Model for Waste Disposal in Traditional, Bioreactor, and Ash Landfills* (1999), at p. 108.

other equally serious biological or chemical interactions that are not yet understood.[10] These hazardous compounds are then transported by the methane into the atmosphere.[11] Releases of these poisons may be associated with studies that have found fourfold increases in bladder cancer and leukemia in women living near landfills.[12]

II
Landfill Gases Are Formed Because Organic Material Is Currently Permitted in Landfills

These problems would not exist, however, were it not for the uniquely U.S. practice of continuing to permit organic material to be discarded with our trash into landfills.

Landfill gases are produced because of the microbial action of bacteria in landfills that decompose the part of the waste stream consisting of organic material into other compounds with lower molecular weight.[13] Those organic materials constitute approximately 61% of the municipal solid waste estimated to being landfilled each year in the U.S.[14]

---

10 S.E. Lindberg, Methylated Mercury Species in Municipal Waste Landfill Gas Samples in Florida USA," 35 *Atmospheric Environment* 4011 (2001).

11 EPA, *Air Emissions from Municipal Solid Waste Landfills — Background Information for Final Standards and Guidelines* (Dec. 1995) (EPA-453/R-94-021), at pp. 1-2 to 1.3. S.E. Lindberg, Methylated Mercury Species in Municipal Waste Landfill Gas Samples in Florida USA," Atmospheric Environment 35 (2001), at p. 4011. EPA, *U.S. Methane Emissions 1990-2020: Inventories, Projections and Opportunities for Reductions* (1999).

12 State of New York Department of Health, *Investigation of Cancer Incidence and Residence Near 38 Landfills With Soil Gas Migration Conditions, New York State, 1980-1989* (1998). *See, also*, Paul Elliot, "Risk of adverse birth outcomes in populations living near landfill sites," 323 *British Medical Journal* 363 (Aug. 2001).

13 EPA, *Air Emissions from Municipal Solid Waste Landfills*, Final EIS (1995), at p. 1-2.

14 EPA, *Characterization of Municipal Solid Waste in the U.S.* (1999).

TABLE 1 **MSW Landfilled in U.S.** 1998		
	Tons (000,000)	Percen t
Paper	37.9	31.1%
Food	16.6	13.6%
Yard	11.7	9.6%
Wood	8.6	7.0%
Total Organic	74.8	61.3%
Total Non-Organic	47.2	38.7%
Total	122.0	100.0%

Decomposition of organic matter begins immediately in a landfill, and produces carbon dioxide until the oxygen is consumed some time between six months and two years after waste emplacement. Once the landfill turns anaerobic, methane is produced. In addition to its global warming properties, the methane also transports many of the hazardous constituents in our trash into the atmosphere, along with CO_2, and is involved with other less well understood interactions such as the conversion of mercury into its lethal and volatile form.[15]

III
Liner-based Landfills Postpone, But Do Not Prevent, Groundwater Contamination

Organic material also creates a parallel threat to our groundwater and drinking water supplies. Many of the constituents of our solid waste, including heavy metals and volatile organic compounds, are hazardous. Although, the statutes purport to define household and commercial waste in engineered landfills to be "sanitary" as a matter of law,[16] municipal waste is, in fact, hazardous. The actual field data examined by the EPA has "not reveal[ed] significant differences in the number of toxic constituents and their concentrations in the leachate" between sanitary and hazardous waste streams.[17]

Moisture mixed with the organic material in the waste stream sustain biological processes that drain those dangerous substances out of the waste load and form leachate that pools at the bottom of the landfill. This hazardous leachate must be isolated from groundwater, especially from our drinking

---

15 S.E. Lindberg, "Methylated Mercury Species in Municipal Waste Landfill Gas Samples in Florida USA," Atmospheric Environment 35 (2001), at p. 4011. EPA, *Air Emissions from Municipal Solid Waste Landfills*, Final EIS (1995), at p. 1-3.

16 42 USC §6903(a)(26).

17 56 FED. REG. 196, at pp. 50982-50984 (October 9, 1991).

water supplies, to protect the environment and public health. To do this, EPA regulations require composite liners on the top, bottom and sides of the landfill to keep precipitation from entering into and the leachate from leaking out of the facility.[18]

However, this is probably one of the worst strategies to have used, as is increasingly recognized in the waste industry.[19] For even composite liners "will ultimately fail" within decades after the agency's post-closure care requirements have expired, EPA has acknowledged,[20] "and when it does, leachate will migrate out of the facility."[21] Yet, the EPA recognizes, the duration of a landfill's hazardous loadings that needs to be isolated may be "many thousands of years,"[22] long after the time when discharges will occur.

This means that today's landfill's will almost certainly leak — just not until after the landfill owner's legal liability has ended, yet before the toxic constituents in the waste load has become benign. Rather than adding additional layers of protection as the industry has claimed, these elaborate barriers have actually only shifted in time the occurrence of environmental damage to a future world long after the responsible entities are gone.

Again, the organic material in our trash is the key focus of concern. That organic material is what keeps the waste load biologically active for such a long period of time. The duration is so great

---

18 40 CFR Part 258.40.

19 John Skinner, "Composting and Bioreactors," *MSW Management* (July/August 2001), at p. 16. Lee, G.F. and Jones-Lee, A., "Assessing the Potential of Minimum Subtitle D Lined Landfills to Pollute: Alternative Landfilling Approaches," *Proc. Air and Waste Management Assoc*. 91st Annual Meeting, San Diego, CA. Lanier Hickman, "Ticking Time Bombs," *Municipal Solid Waste News* (SWANA) (March 1995). Abraham Michaels, "Solid Waste Forum on Landfills," *Public Works* (April 1995). D.P. Komilis, R.K. Ham, R. Stegmann, "The Effect of Landfill Design and Operation Practices on Waste Degradation Behavior: A Review," 17 *Waste Management and Research* 20-26. (1999). Pat Sullivan, "Just What is a Bioreactor Landfill," *MSW Management* (July/August 2000).

20 53 FED. REG. 168, at pp. 33344-33345 (August 30, 1988).

21 46 FED. REG. 11128-11129 (February 5, 1981). "A liner is a barrier technology that prevents or greatly restricts migration of liquids into the ground. No liner, however, can keep all liquids out of the ground for all time. Eventually liners will either degrade, tear, or crack and will allow liquids to migrate out of the unit. Some have argued that liners are devices that provide a perpetual seal against any migration from a waste management unit. EPA has concluded that the more reasonable assumption, based on what is known about the pressures placed on liners over time, is that any liner will begin to leak eventually." FEDERAL REGISTER (July 26, 1982), at pp. 32284-32285.

22 46 FED. REG. 28314-28328 (May 26, 1981).

that manmade containment barriers will certainly have degraded long before toxicity levels will have subsided to below regulatory standards.

IV
The Real Issue is How to Prevent Gas Production and Prolonged Biological Activity

Thus, the real issue is not whether to encourage energy recovery of the extremely minor fraction of the total landfill gases generated that landfill operators actually captured. The far more critical question – since we do not have the tools to abate most of those dangerous gases – is how to prevent them from being produced in the first place.

The answer to the landfill problem is obvious. Just as the European Commission has already done,[23] to protect the environment we need to phase out land disposal of organic matter that constitutes 61% of our discards.

V
Alternatives to Landfilling Organic Material Are the Only Real Solution

Composting and Bioconversion. To protect the environment from landfill pollution, one obvious option is to incrementally build upon our existing and proven material recovery efforts. In addition to source separating containers and newspapers in our trash for recycling, we can actually remove the leading type of waste creating these problems by also source separating organic materials for composting or other forms of bioconversion. When applied to clean streams of organics, these technologies not only do not contribute to uncontroled methane releases, they also make needed end products. Composters, as one example, can transform grass clippings, paper towels and rotten vegetables with controlled, above ground operations that are uncontaminated with intractable toxic contamination, into a soil amendment that helps restore fertility to our gardens, farms and forests.

VI
Subsidizing Waste Disposal Is Poor Economic and Tax Policy

Discourages Positive Alternatives. When the landfill regulations under Subtitle D of the 1984 Resource Conservation and Recovery Act Amendments were promulgated in 1991, tipping fees averaged approximately $30 per ton.[24] However, for the reasons mentioned, the rules in their original contemplation were not adequate to protect the environment. Consequently, disposal is already

23 Commission of the European Community, *Management and Composition of Leachate from Landfills: Final Report* (1994), at p. 7, Table 1.2.

24 Chartwell Publishers, *Solid Waste Digest*.

significantly subsidized by the neighboring communities which are most directly impacted by the air and groundwater discharges.

One of the factors that inhibited EPA's ability to implement strong rules, even though their technical experts sounded many of the same warnings as we have in this paper, was the insistence from the political process that regulations not significantly increase disposal costs.

It is ironic that shortly thereafter the same political pressures were applied to permit changes in common operational practices that were not technically validated in order to substantially *reduce* disposal costs. In effect, new subsidies were layered on top of the original flaws in the fundamental structure of liner-based landfills as the industry pushed for the construction of mega-sized landfills 20 or more times larger than anything previously envisaged. By overlying 300 or 400 feet instead of 100 to 200 feet of waste on top of the same underlying infrastructure of liners, piping and wells, unit costs for waste disposal have been pushed below $20 per ton, a 30% reduction in prices.[25]

If SECTION 45 landfill gas tax credits are enacted to replace the SECTION 29 credits that expired two years ago, we estimate that another $2 or more per ton subsidy will be added on top of those environmental subsidies. Related benefits could increase that to almost $5 per ton in states with requirements that their electric utilities maintain a power portfolio that includes "green" or renewable power sources inappropriately defined to include landfill gas.

The cumulative weight of all the subsidies for wasting has made landfilling artificially seem to be a fraction of its true cost. That has made it impossible for expanded composting or other such proposals to compete in the marketplace.

Inefficient Tax Mechanism. The particular form of the tax credit enacted in H.R. 4 is particularly inefficient because for four reasons.

[1] Available Without Regard to Need. H.R. 4 adds landfill gas to the definition of open loop biomass to qualify energy generated from the gas for SECTION 45 credits as an across-the-board credit provided to all taxpayers irrespective of need.[26]

The full 1.7¢/kWh credit is available across-the-board to everyone installing new generating units. However, energy recovery systems for landfill gas are already financially viable in several states

---

25 The changing relationship over time between disposal prices and their underlying costs is most consistent in competitive markets where competition drives prices down to the point where they only recover costs plus a return on investment adequate to insure that the industry's capital needs can be met in the future. While some markets for waste services are not competitive today, enough are to make the sharp decline in tipping fees charged at large landfills to be reflective of changing costs.

26 H.R. 4 SECTION 3102 (b).

with higher electricity costs because the price paid to independent power producers is sufficient to recover the costs of the systems, including a fair return on the investment.

The EPA has estimated that breakeven point for an average landfill in 1996 to be electricity prices paid to landfills of approximately 4¢/kWh.[27] The recent commercial introduction of efficient micro turbines has reduced the break-even point further. Other factors reducing the break-even point futher are, due to scale efficiencies, the continuing growth in landfill size, and various operational practices described earlier to maximize the collection of gas from regions of the site where gas generation is densest or to accelerate decomposition.[28]

The Energy Information Administration electricity data base shows average industrial electricity rates by state, which is a readily available proxy for the avoided costs used to set prices paid to independent power producers. Thirty-three states have industrial rates higher than the conservatively estimated 4¢/kWh hurdle price for electricity sales, and the average rate weighted by each state's waste generation is 4.62¢/kWh, 16% more than 4¢/kWh.[29]

The across-the-board credit has created a tax structure in which the benefits can flow to both those for whom the subsidy is necessary to make the project financially profitable, and also to those in the majority of states, which have electric rates sufficient to economically justify energy recovery, who would have proceeded with energy recovery without the subsidy. Prior to 1999, landfill gas tax credits were available under SECTION 29 of the Internal Revenue Code. An examination of whether landfills in states with higher electricity rates were more likely to install electric generating units on their wellheads provides an indication of the inefficiency of the credit in achieving its objectives.

The EPA Methane Reduction Outreach Project has provided us with its records of those landfills voluntarily reporting they had installed energy recovery systems in that time frame. A comparison of installed capacity to electric rates suggests that the credit has a significantly greater impact on those states where the systems would have been economically justified without the subsidy as shown in the following TABLE.[30]

---

27 EPA, *U.S. Methane Emissions 1990-2020: Inventories, Projections and Opportunities for Reductions* (1999), at p. 2-7.

28 Walt Wiley, "L.A. powers up LFG project," *Waste News* (September 3, 2001).

29 Energy Information Administration, Electric Sales and Revenue 1999 (2000), at p. 67.

30 Several states require their electric utilities to a generate a minimum proportion of their total power needs from "green" sources of electricity. These so-called "green portfolio" mandates were originally intended to encourage renewable sources of power such as solar, wind and biomass, but have sometimes been loosely interpreted to include landfill gas, even though the resources from which landfill gas derives is not infinitely renewable, but rather involve the consumption of resources that have been discarded. Because landfill gas

(continued...)

[30] (...continued)

only competes for utility green portfolio business against more expensive solar and wind sources, this insures landfills a market for their electrical output at a higher rate than Independent Power Producers normally receive. Unfortunately, there is no comprehensive data base of these complex interactions to incorporate into TABLE 3 in order to complete the picture.

TABLE 2

Comparison of Installed LFGTE Systems to Electricity Prices

STATE	INSTALLED LANDFILL ELECTRIC (MWH)	MSW WASTE GEN TONS/YEAR (000)	CAPACITY/ PER WASTE GENERATION MW/MMTONS MSW	INDUSTRIAL ELECTRICITY PRICE (CENTS/KWH)	INDUSTRIAL PRICE/ MEAN (%)
AL	0.00	5,710	*0.00*	*3.90*	-20%
AK	0.00	675	*0.00*	*4.20*	-14%
AZ	10.40	5,187	2.01	5.04	3%
AR	0.00	4,063	*0.00*	*4.20*	-14%
CA	297.22	60,000	4.95	7.16	47%
CO	17.70	6,455	2.74	4.38	-10%
CT	14.10	3,168	4.45	7.83	60%
DE	6.00	2,000	3.00	4.73	-3%
FL	30.00	24,858	1.21	4.77	-2%
GE	34.50	11,420	3.02	4.15	-15%
HI	3.20	1,884	1.70	9.73	99%
ID	0.00	794	*0.00*	*3.10*	-36%
IL	205.04	13,515	*15.17*	*5.02*	3%
IN	23.76	6,798	3.50	3.89	-20%
IA	12.40	3,500	3.54	3.89	-20%
KS	2.00	3,000	0.67	4.47	-8%
KY	0.00	4,077	*0.00*	*3.00*	-39%
LA	2.00	4,800	0.42	4.25	-13%
ME	0.00	1,635	*0.00*	*6.40*	31%
MD	8.03	6,000	1.34	4.26	-13%
MA	32.42	8,142	3.98	7.75	59%
MI	80.15	19,500	4.11	5.05	3%
MN	29.70	5,445	5.45	4.46	-9%
MS	0.00	2,264	*0.00*	*4.20*	-14%
MO	17.90	9,560	1.87	4.38	-10%
MT	0.00	1,082	*0.00*	*2.90*	-41%
NE	6.40	1,820	3.52	3.57	-27%
NV	0.00	3,153	0.00	4.90	0%
NH	21.40	1,284	*16.67*	*12.78*	162%
NJ	46.50	7,800	5.96	7.69	58%
NM	0.08	2,966	0.03	4.25	-13%
NY	70.00	29,650	2.36	4.77	-2%
NC	11.77	13,000	0.91	4.57	-6%
ND	0.00	498	0.00	4.00	-18%
OH	38.80	12,015	3.23	4.33	-11%
OK	23.10	3,545	6.52	3.60	-26%
OR	48.90	4,415	*11.08*	*3.51*	-28%
PA	76.40	9,800	7.80	5.22	7%
RI	14.00	421	*33.25*	*7.39*	51%
SC	4.72	9,409	0.50	3.72	-24%
SD	0.00	514	*0.00*	*4.60*	-6%
TN	10.30	9,213	1.12	4.10	-16%
TX	73.70	34,023	2.17	3.97	-19%
UT	0.00	2,362	0.00	3.30	-32%
VT	1.20	367	3.27	7.30	50%
VA	18.02	8,136	2.21	3.84	-21%

WA	70.93	6,638	10.69	2.70	-45%
WV	0.00	1,300	*0.00*	*3.80*	-22%
WI	51.22	4,000	*12.81*	*3.89*	-20%
WY	0.00	530	*0.00*	*3.40*	-30%

[2] Grandfather Clause. At a slightly reduced level, the credit is available to those who installed energy generating units prior to the law without any financial encouragement. H.R. 4 also qualifies facilities installed prior to the passage of the act with the credit, too, reduced by one-third.[31] Certainly, those who have installed systems prior to the law's introduction, but are eligible for two-thirds of the credit did not do so only because of the subsidy.

[3] Local Governments Lose Half. An examination of the EPA Methane Outreach Project data base shows that 46% of all electric generating landfill projects installed while SECTION 29 credits were in effect were municipally owned. Governmental units do not pay taxes and are not directly eligible for the credit. In order to qualify, most will nominally pass the gas through the hands third parties for tax purposes. But, something in the order of half of the value of the credit can often be subtracted in the transaction costs for qualification.

This suggests that a significant share a significant share of the municipal facilities with installed capacity would have installed power production equipment without the subsidy because either their state's electric rates were high, or, since they were not market driven like the private sector, they commendably did so in order to follow best practices. In those cases, the credit serves to reduce local property taxes, not change behavior as Congress intends. Since legal counsel generally will not credit revenues from this subsidy in rating bonds because tax benefits change so frequently, the ability to municipalities to finance generator investments are not be affected by the credit.

[4] Misapplication and Fraud. Moreover, historically tax credits intended to encourage new sources of energy have demonstrated a singular lack of success and awe-inspiring potential for abuse. Credits for residential solar and wind systems were exploited by salesmen to increase their prices by the same amount as the credit. Coal companies sprayed waste oil over coal to qualify it as synthetic fuel eligible for tax benefits.[32] Credits for landfill gas under the old SECTION 29 provisions were, because of loophole, qualified by straw sales of the gas to third parties, who just flared it (which is one the reasons that the gas credits have been moved to SECTION 45 in order to avoid the stigma of the former provision).

With that history, the prospect of SECTION 45 credits avoiding the same fate does not appear to be extraordinarily high.

---

31 H.R. 4 SECTION 3102 (c)(6).

32 John McKinnon, "Lobbying Helps Companies Turn Coal Into Tax Credits," *Wall Street Journal* (July 12, 2001).

VII
Mandate Energy Recovery Instead of Tax Credits

There is no debate that *if* the organic part of our trash that forms methane when it decomposes is discarded in the ground, then the small fraction of the total quantity of methane which is actually captured from the seriously inefficient gas collection systems certainly ought to be used to generate energy.

But, we do not offer tax subsidies in lieu of regulations to insure that liners and leachate removal systems are installed in landfills. We ought not do so energy recovery, especially since doing so has severe environmental impacts. There is only one possible exception if subsidization were considered a preferable option to regulation. Subsidies for closed landfills will have no effect on going-forward decisions on whether organic material will be discarded in the ground, as would across-the-board credits that would make landfilling appear to be cheaper.

!

Across-the-board tax credits for landfill gas energy recovery are an ineffective tool on its own terms, making it defective tax policy. When we come to understand that the same thing that creates landfill gas also makes it impossible to safely manage a landfill, the use of subsidies to encourage more land disposal of organic matter is unsound environmental policy. ‘