"COMPATIBILITY OF WTE AND RECYCLING SURVEY RESULTS"

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Introduction

A survey of more than 70 communities shows that recycling and waste-to-energy are compatible--and that they normally help each other in managing the municipal waste stream.

Materials recycling and waste-to-energy (WTE) combustion appear to work better together than they do apart, according to a survey conducted by the Integrated Waste Services Association (IWSA) among nearly 70 communities across the country. The participating communities currently rely on or are planning to build a WTE plant as a component in their integrated waste management program.

The recycling-WTE survey was conducted during May to July 1992, with a key criteria being that all of the communities are now or will be serviced by a modern WTE plant. 66 communities were contacted, with 51 currently serviced by a WTE plant, two with a WTE facility under construction, and 13 planning to implement WTE. The 51 facilities represent more than one-third of all operating WTE plants and 65 percent of the WTE processing capacity in the U.S.

The survey respondents included MSW management professionals in each community, including (in order of most frequent contact) municipal officials, recycling coordinators, waste
management authority personnel, industry representatives, a consultant, and a trade association employee. The same questions were asked of each, the most important of which included:

* What type of recycling programs exist in the location served by the WTE plant?;
* Is the recycling program(s) expanding?;
* What percentage of the MSW stream is reported to be recycled?;
* What community recycling program(s) really stand out?; and
* Do you believe that WTE and materials recycling are compatible?

Table 1 provides community data relating to WTE and area population. As indicated, the 51 operating WTE plants are now processing more than 20 million tons of MSW annually for more than 24 million people. In addition, the 15 WTE plants under construction and being planned will help meet the waste management needs of nearly eight million people by processing an additional seven million tons per year (tpy) once operational.

On-Site Recycling Programs

Table 2 details ferrous metal recovery activities on-site at the WTE plants. From the table it may be seen that 90 percent of the operating WTE plants have on-site ferrous metals recovery programs. Based on those plants from which specific ferrous data was available, 780 tons per day (tpd) are recovered for recycling. This equates to approximately 242,000 tpy of ferrous metals. Most of these metals are recovered post-combustion at mass burn WTE operations. The exception to this occurs at several refuse-derived fuel (rdf) plants where ferrous is separated during the front-end processing of MSW required to produce the rdf.

Other types of on-site recycling activities were also reported at many of the operating WTE facilities, with the recovery of non-ferrous metals being the most prevalent. Efforts such as the recovery of plastics, glass, white goods (e.g., bulky appliances), and combustion ash were also mentioned.

For WTE projects now under construction and in the planning stage, 100 percent of those responding will recover ferrous metals for recycling. Additional on-site recycling activities are expected to include the recovery of non-ferrous, plastics, glass, and corrugated cardboard at various facilities.

Off-Site Recycling Programs

In terms of off-site recycling efforts, Table 3 defines the general types of recycling and associated participation rates, and also to what extent these programs are expanding.

All 66 communities surveyed are currently engaged in materials recycling. The most prevalent type of programs are curbside collection (found in 76 percent of the responding communities), yard waste composting (70 percent), drop-off centers (67 percent), and materials recovery facilities (21 percent). A combination of these programs are often found in the same community. In addition, 74 percent reported to have other types of recycling initiatives for materials such as batteries, corrugated cardboard, used oil, telephone books, and others.

All of the responding communities have efforts that are expanding. This reflects remarks from 59 percent of the total survey population. Data from the remaining 41% were not available at the time of the survey. Examples of program expansions include the start-up of curbside collection and enlargement of a materials recovery facility in Kent County, Michigan, mandatory source separation after September 1, 1992 in all New York communities per state law, and the implementation of a yard waste composting effort along with broader curbside collection participation in Charleston, South Carolina.

Outstanding Recycling-WTE Programs

Among the 53 communities from which recycling rate data were available, 32 (60 percent) have rates exceeding the national average. The average recycling rate among these 32 communities is 29 percent. If the recycling rate for all 53 communities is considered, the average rate is 21 percent. These rates include all types of recycling reported by each community, but do not generally reflect the rates achieved by individual towns within the community.

Two of the local recycling programs identified, in the City of Newark, New Jersey and the Town of Newton, Massachusetts, have received awards in recognition of their excellence. Newark's program was recently recognized at both the national and regional levels, in EPA-sponsored competitions, for maintaining a recycling rate exceeding 50 percent. Other criteria by which the city was judged included the types of materials recycled and the calibre of its education outreach initiatives. Newton's 1992 award was co-sponsored by the U.S. Conference of Mayors and the H. J. Hines Company Foundation. The winning criteria was based on how well Newton's recycling program integrated with other management options, its design innovation, the level of support from the political leadership, the level of commercial recycling, and others.

Recycling-WTE Compatibility

The final survey question sought the opinion of community MSW management professionals regarding the compatibility of WTE and recycling. All 73 of those contacted stated that the two options are compatible. The most common supporting reasons cited, along with pertinent qualifications made, are provided below. Community examples are also given. Table 4 profiles those who were contacted.

Combination Of WTE & Recycling Promotes Self-Sufficiency. This is accomplished by reducing community reliance on others to manage their MSW. Many communities would have to export their MSW to out-of-state destinations if it were not for their successful implementation of recycling and WTE programs. These communities have control over their MSW management programs and the associated costs.

For example, in Essex County, New Jersey, out-of-state exportation of MSW dropped from 100 percent to 0 percent following the implementation of recycling and WTE. Further, the Town of Islip, New York has had a similar experience, as described by Peter Daily, Recycling Coordinator for the Islip Resource Recovery Agency. "If not for a successful combination of recycling and waste-to-energy technologies, the exportation of garbage would be a reality for the Town of Islip. A visionary approach to managing garbage has enabled our town to remain totally self-sufficient in light of state mandates."

Properly Sized WTE Help Community's Achieve Recycling Objectives. More specifically, accurate waste management planning will enable communities to establish meaningful recycling goals while also implementing sufficient WTE capacity to help meet the remainder of the need.

If recycling activities reduce the amount of MSW going to the WTE plant to the point where capacity becomes available, the service area can be broadened to help solve regional waste management problems. An example of this is the cooperative arrangement between the Towns of Hempstead and Brookhaven, New York where WTE ash from Hempstead's WTE plant is disposed in Brookhaven's landfill, in exchange for MSW disposal at the WTE.

Another example is provided by Bay County, Florida where WTE has augmented local recycling efforts, according to Bill Hudson, Acting Director of the County's Solid Waste Department. Due to the large seasonal tourist fluctuations (i.e., MSW generation), excess WTE capacity is marketed to outside counties. In the process, participating jurisdictions are able to extend the life of their local landfills.

WTE Is A Form Of Recycling. Many communities notes this from the standpoint that the MSW is reused in a productive way and the energy value is recovered for beneficial use. In addition, other on-site recycling programs, such as post-combustion ferrous recovery, collect many

recyclables that might otherwise not be efficiently captured. John Maier, Gloucester County, New Jersey Freeholder Director, notes "By recycling the energy out of 400,000 tons of waste since January 1990, we have generated the equivalent of more than 250,000 megawatts of clean electricity. You'll find the citizens of Gloucester County agree: waste-to-energy has enhanced our recycling efforts, augmented our energy efficiencies, and improved the safety of our environment."

Another example is provided by Frank Fasi, Mayor of the City and County of Honolulu, Hawaii. "We now recover nearly 20,000 tons of ferrous metal each year, and we're installing another system to recover nonferrous metals as well. The facility is an important source of energy for the Island, too, with each ton of trash yielding the equivalent of 62 gallons of oil. Best of all, the energy is clean and easily meets stringent state testing requirements."

WTE Promotes Recycling. Communities noted this to be the case by way of direct and indirect subsidization and incentives. Examples of direct subsidization include: 1) Surcharges are added to the tip fee at the Mid-Connecticut WTE plant near Hartford to cover the operating cost of a community material recovery facility, thereby providing an economic incentive for municipal participation in recycling efforts; and 2) The salaries of community recycling staff are funded out of the disposal fee charged at the Fairfax County, Virginia WTE facility.

Examples of indirect subsidization and incentives include: 1) A revenue sharing arrangement with the community established at the Baltimore, Maryland WTE plant whereby funds generated are, in part, directed toward recycling programs; 2) An arrangement stipulating that for every ton of MSW directed toward recycling and not delivered to the Westchester County, New York WTE plant the community is awarded a monetary sum; and 3) By helping to establish realistic disposal fees for responsible MSW management, the Kent County, Michigan WTE facility provides waste generators with an incentive to recycle to the maximum extent (i.e., thereby reducing their disposal bills), according to Bill Allen, Project Director of the Kent County Department of Public Works.

Removal of most types of recyclable materials prior to WTE results in less operations and maintenance (O&M) problems at the plant (e.g., from the clogging of the system, etc.) and a cleaner, higher energy content fuel (i.e., many recyclables do not burn). The life of the WTE plant may be extended in the process, the need for additional WTE capacity is less of an immediate issue, and less WTE costs are generated (e.g., less O&M costs, less ash disposal costs, etc.). This has been the type of experience reported by communities such as Wallingford, Connecticut, McKay Bay, Florida, Pinellas County, Florida, and others.

Communities like Dutchess County, New York also reported that by recycling high Btu products such as certain types of plastic and corrugated cardboard, WTE throughput capacity can be maximized. More specifically, the quantity of MSW that can be burned at a WTE plant is normally based on the heat release rate of the MSW (i.e., the Btu per pound). By removing high Btu items for recycling, the lower Btu value associated with the remaining MSW means that more can be processed by the combustor.

WTE Provides Communities With A Safety Valve. This is true during periods when material markets are uncertain, according to Phil Brown with the Greater Detroit Resource Recovery Authority. If the markets become unavailable, the Btu value in the combustible materials can be recovered. The revenues generated can then help keep the recycling efforts (e.g., separation and collection) afloat. In addition to Detroit, communities like Babylon, New York, Tulsa, Oklahoma, and other have shared this type of experience.

In Lancaster County, Pennsylvania, the WTE tip fee for materials like newspaper is set above available recycling market rates. This provides a local incentive to recycle.

Conclusions

The evidence indicates that recycling and WTE work hand-in-hand in helping communities solve their MSW management needs. Real world examples demonstrate the different ways this is happening and point to an important reality: Accomplishing effective MSW management requires a combination of options operating within a system that allows for maximum flexibility and creativity. The combination of recycling and WTE provide an excellent cornerstone toward this critical objective.

TABLE 1
WTE & Population Profile of Surveyed Communities

	Operating WTE	WTE Under Construction	Planned WTE	Total
# Plants	51	2	13	66
Net Processing Capacity (tpd) (1)	56	3	16	75
Net Processing Capacity (tpy) (2)	20	1	5	27
Estimated Population Served (3)	24	1	7	32

1. Expressed in thousands of tons per day. Also assumes 85% plant availability (i.e., 15% scheduled down-time).

2. Expressed in millions of tons per year. Also assumes 85% plant availability.

3. Expressed in millions of people.

TABLE 2
Ferrous Metals Recycling At Waste-to-Energy Operations

	Operating WTE	WTE Under Construction	Planned WTE	Total
# Plants Recovering Ferrous (1)	46	2	12	60
Percent Of Total (2)	90	100	100	92
Quantity Of Ferrous Recovered (tpd) (3)	780	n/a	n/a	780
Quantity of Ferrous Recovered (tpy) (4)	242	n/a	n/a	242

n/a = data not available at the time of the survey

1. Includes three operating projects that are now implementing ferrous metals recovery for recycling.

2. For operating WTE, N = 51; for WTE under construction, N = 2; for planned WTE, N = 12.

3. This represents the quantity reported by 59% (i.e., 27 plants) of the operating WTE facilities surveyed who reported that ferrous recovery occurs on-site. Quantity tonnages from the remaining 41% were not available at the time of the survey.

4. Expressed in thousands of tons per year. Also assumes 85% plant availability (i.e., 15% scheduled down-time).

TABLE 3
Off-site Recycling Programs & Participation Rates (1)

	Operating WTE	WTE Under Construction	Planned WTE	Total
Communities W/Off-Site Recycling (2)(3)	51 (100)	2 (100)	13 (100)	66 (100)
Communities With Expanding Programs (4)	31 (100)	1 (100)	8 (100)	40 (100)
Types Of Community Recycling Programs:				
Curbside Collect.(5)	36 (71)	1 (50)	10 (91)	47 (73)
Drop-Off Center (5)	35 (69)	0 (0)	7 (64)	42 (66)
Material Rec. Fac. (5)	10 (20)	1 (50)	2 (18)	13 (20)
Yard Waste Compost (5)	36 (71)	1 (50)	7 (64)	44 (69)
Other (3)(6)	39 (76)	0 (0)	10 (77)	49 (74)

1. The first number shown in each category indicates the number of communities. The second number, in parentheses, reflects the percentage of communities with the type of recycling specified in each category. Also note that the number of sample population responders may vary from category to category.

2. Includes the entire range of recycling operations and specific materials recovery efforts in the community served by, or planning to be served by, a WTE plant. Examples of the programs reported by the communities include: anti-freeze, ash, asphalt shingles, auto bodies, batteries, bottle bills, buy-back centers, christmas trees, construction & demolition debris, corrugated cardboard, curbside collection, drop-off centers, ferrous metals, glass, household hazardous materials, magazines, material recovery facilities, mixed paper, newspaper, non-ferrous metals, used oil, office paper, plastic, scrap metals, telephone books, tires, white goods, yard waste compost, other.

3. Survey respondents for operating WTE, N = 51; for WTE under Construction, N = 2; for planned WTE, N = 13, Total, N = 66.

4. Survey respondents for operating WTE, N = 31; for WTE under construction, N = 1; for planned WTE, N = 8, Total, N = 40.

5. Survey respondents for operating WTE, N = 51; for WTE under construction, N = 2; for planned WTE, N = 11, Total, N = 64.

6. Includes at least one of the other types of recycling efforts referenced in footnote number 2.

TABLE 4
Profile Of Community MSW Management Professionals

Type Of Professional	Number Contacted (1)	Percent Of Total
Municipal Official (2)	25	34
Recycling Coordinator (3)	19	26
Waste Mgt. Authority (4)	15	21
WTE Representative (5)	12	16
Consultant	1	1.5
Trade Association Employee	1	1.5
Total	73	100

1. More than one MSW management professional was contacted in several of the communities

2. Includes town, city, county, etc., officials working for the municipal government(s) serving the community.

3. Refers to the person directly involved with recycling activities in the community.

4. Person working for what has been typically established as an independent entity responsible for overseeing the management of a community's MSW.

5. Includes plant managers and other staff at the community's WTE facility.