

Solid Waste Authority of Palm Beach County
Response to the
Florida Chapter of the Sierra Club

Prepared for:



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Attachments

- Attachment A Correspondence dated March 17, 2011 to Commissioner Santamaria (Authority) from E. Dwight Adams, Sierra Club, Florida Chapter
- Attachment B "Draft Alternative Solutions for West Palm Beach, FL" prepared by ILSR for the Florida Sierra Club, March 2011

Solid Waste Authority of Palm Beach County

Response to the Florida Chapter of the Sierra Club

1.0 Executive Summary

The Solid Waste Authority of Palm Beach County (Authority) is asking the Authority Board of Directors to approve contracting for a 3,000 ton-per-day (TPD) waste-to-energy (WTE) facility to be added to the Authority's existing integrated solid waste management infrastructure and services. The Authority recently received comments from the Florida Sierra Club, suggesting that the Authority Board postpone approval of the plant and study alternative waste disposal methods. With the Institute for Local Self Reliance (ILSR), the Sierra Club raised a number of questions concerning the economic and environmental impacts of the WTE facility and suggested various alternatives.

The Authority asked solid waste management consultants Gershman, Brickner & Bratton, Inc. (GBB) to review the documents from the Florida Sierra Club and ILSR and assess the accuracy of the statements and claims made about diversion rates and solid waste programs in certain U.S. counties and cities. In addressing some of the statements, questions and concerns raised by the Florida Sierra Club and ILSR, GBB received input from the Authority. In response to the ILSR's questions about greenhouse gas emissions, GBB used EPA's Waste Reduction Model (WARM) to analyze the impact of the new WTE facility on the County's greenhouse gas emissions (GHG) compared with the emissions that result from the current and different mixes of programs and disposal methods.

The Authority's goal: Long-term, sustainable solid waste management

In moving forward to build a new WTE facility, GBB understands that the Authority's goal is to ensure that Palm Beach County's solid waste management system is sustainable, cost-effective, efficient and self-reliant – a system that preserves landfill space and avoids shipping waste to out-of-County landfills, as many other jurisdictions do. Because the new facility will produce power, energy sales will help offset operations and maintenance expenses. Further, compared with landfill disposal, incineration reduces the volume of waste to be disposed by 90%.

The following points summarize responses to the major issues raised by the ILSR and Florida Sierra Club.

WTE is fully compatible with recycling and integral to well-managed solid waste systems. Studies have shown that communities with WTE facilities are likely to have recycling rates at least five (5) percentage points above the national average. The fact that WTE and recycling are not mutually exclusive is demonstrated in the higher than average diversion results from counties and cities from coast to coast, including several that the Florida Sierra Club and ILSR have highlighted, which actually dispose of waste in WTE facilities:

- **Worcester, MA.** Worcester has a 43% recycling/diversion rate, a PAYT program and waste disposal at a WTE facility. Although Massachusetts has a moratorium on new WTE facilities (as the ILSR points out), the seven permitted WTE facilities in the Commonwealth manage disposal of roughly 38% of Massachusetts' municipal waste.
- **Montgomery County, MD.** Montgomery County's award-winning integrated solid waste management system has a 44% recycling rate, a recycling facility, a composting facility and a WTE plant. The County does not rely on its general fund to support solid waste services. Instead, the County residents, businesses and institutions pay a System Benefit Charge and other fees, which cover the County's costs for developing and maintaining its solid waste programs and facilities. This charge is not a subsidy to support the system, as the ILSR claims.

Some communities that have abandoned WTE to wait for a better technology have lower recycling rates and haul their waste to landfills, many of them distant, and to WTE facilities. The following communities, all of which worked with ILSR, considered WTE facilities, but did not proceed. The delay has been costly: diversion rates stalled, and in the end, many of these communities ended up using WTE facilities for their disposal needs.

- **Philadelphia, PA.** In the 1980s, Philadelphia considered WTE but abandoned the idea when opposition arose. But now, 55% of the City's waste is hauled to out-of-city WTE facilities and 45% to landfills. The City's diversion rate has grown modestly from 6.4% in 1997 to about 18% for waste managed by the City. The City now participates in RecycleBank's Recycling Rewards program, which provides financial incentives for recycling. The City's Green Works goal is to send 70% of its waste to a WTE option, using either mass-burn or an alternative WTE technology.
- **Washington, DC.** Washington considered constructing a WTE facility in 1986 and again in 1994, but abandoned the project. The City now sends its residential and yard waste to the WTE facility in Fairfax, VA. The City's diversion rate is 24%.
- **Austin, TX.** Austin also considered a WTE facility but abandoned the plan. Meanwhile, the City's landfill has closed and its waste has been landfilled. Austin's diversion rate is 30.8%

WTE reduces greenhouse gas emissions. Using the WARM analysis, GHG emissions from Palm Beach County's proposed WTE facility, with recycling remaining at 37%, combustion increased to 52%, and landfilling decreased to 11%, will decrease by 0.2 million metric tons of carbon dioxide equivalent (MTCO₂E) when compared with emissions from the current mix – a result equivalent to 0.6 million barrels of oil. Further, the Authority's proposed WTE facility generates a lower amount of GHG emissions than the program mixes of other locations, including Montgomery County, MD; Washington, DC; Philadelphia, PA; and Austin, TX. Even though a location may have a higher overall diversion rate than Palm Beach County, if it sends a lower percentage of materials to recycling (e.g. to materials recovery facilities), the amount of greenhouse gas emissions will be higher. The WARM analysis associates traditional recycling of paper, bottles, and cans with a substantial decrease in greenhouse gas emissions. Due to California's methodology for calculating waste tonnage, San Francisco is the only jurisdiction in this WARM analysis with lower GHG

emissions. However, using actual tonnage numbers handled by the City's waste hauler (excluding private hauler tonnages) results in higher GHG emissions. Although Montgomery County currently has a higher diversion rate than Palm Beach County, Montgomery County's program mix would still generate more GHG emissions than Palm Beach County, even with the new WTE facility. The other jurisdictions have lower diversion rates, and greater emissions.

Where the Harrisburg and Camden WTE plants have had issues, there were contributing factors concerning management and financing rather than any operational difficulties.

- **Harrisburg, PA.** The problems in Harrisburg resulted from mismanagement by governing officials and the poor maintenance of the facility during its initial 30 years of service. During the early years of the Harrisburg Incinerator, there were a couple of attempts to privatize its operation. More recently, the Harrisburg Authority's prior contractor failed to fully implement the facility's retrofit. After attempts to fix the plant were unsuccessful, another contractor was selected – one with an extensive track record who completed the retrofit and now has the facility running at 90% availability.
- **Camden, NJ.** While it is true that New Jersey intervened to subsidize the WTE plant in Camden, the bailout was associated with changes in waste flow control due to a Supreme Court decision, which has since been reversed, and to New Jersey laws. It should be noted that New Jersey's bailout was not for WTE facilities alone; the subsidies were for landfills and transfer stations as well.

There is a resurgence of interest in WTE technology.

- **Hillsborough County and Lee County, FL.** These two counties have each recently expanded their WTE facilities; **Honolulu, HI**, is also constructing an additional line to its WTE facility.
- **Frederick County, MD.** Frederick County and nearby Carroll County are planning a new 1,500 TPD WTE after realizing that hauling their waste out of state was not a viable long-term solution.
- Other communities are considering WTE as well as conversion technology projects, including **Los Angeles, CA**; **Indian River County, FL**; and **St. Lucie, FL**.

All solid waste systems cost money. While WTE facilities produce electricity that can help offset costs, and recyclables generate revenue, no system is cost-free. The Authority has a track record of successful management of its solid waste system and the foresight to look ahead and build for growth 2010 – 2050. It is spurious to suggest that the capital costs for the Authority's WTE are excessive. **There is no one-size-fits-all solution to solid waste issues.** Palm Beach County comprises 38 municipalities and the unincorporated area, which differentiates it from many of the cities and counties discussed in the ILSR document. WTE is a critical element of the Authority's system – one that is currently well-managed, cost-effective, efficient, and environmentally sound – and this new

facility will reduce the need to site another landfill. The proposed facility will ensure that with the exception of outage periods, Palm Beach County will landfill no combustible waste for decades, and the current landfill's life will be extended to at least 2048. Many of the solutions suggested by the ILSR and Sierra Club are already in place and promoted by the Authority (e-waste collection, source reduction procurement, backyard composting) or not appropriate for the Authority to rely upon (extended producer responsibility, zero waste zone for restaurants, anaerobic digestion, or residential food waste collections).

At the same time, recycling is currently and will remain a key element in the County's solid waste management infrastructure, with all the evidence showing that recycling is not impeded by WTE. As the new WTE facility is being implemented, the Authority should continue to work with its member municipalities and customers in the unincorporated area to expand recycling and maximize diversion. Any further construction delay of the proposed facility is not necessary and could cause the Authority to either expand its landfill resources or rely on out-of-County disposal well before 2048.

2.0 Introduction and Background

The Solid Waste Authority of Palm Beach County (the Authority) is asking the Authority Board of Directors to approve contracting for a new 3,000 TPD WTE facility to be added to the Authority's existing integrated solid waste management infrastructure. The Authority has received comments from the Sierra Club, Florida Regional Office (Sierra Club), and its consultant, the Institute for Local Self-Reliance (ILSR).¹ The comments can be summarized as follows:

- In lieu of the Authority adding a 3,000 TPD WTE facility to its infrastructure, the project should be postponed and alternatives considered. The Sierra Club states, "The County could save significant money by pushing a more aggressive recycling program rather than expanding its waste to energy component."
- New technologies for waste diversion are on the horizon.
- The size of the facility is too large; there would be excess capacity.

In the late 1980s, when the Authority first began planning its recycling infrastructure, GBB assisted the Authority in planning and implementation of the recycling programs and services currently in place and the terms of the Authority's collection contracts. As an independent consultant, GBB offers objective advice to its clients as they deal with solid waste-related decisions. In 2009, the Authority asked GBB to review and provide a status report on conversion technologies. GBB has not been involved in the planning and development of the Authority's new WTE project.

¹ Correspondence dated March 17, 2011, to Commissioner Santamaria (Authority) from E. Dwight Adams, Sierra Club, Florida Chapter; and "Draft Alternative Solutions for West Palm Beach, FL," prepared by ILSR for the Florida Sierra Club, March 2011; copies included in this report as Attachment A and Attachment B, respectively.

2.1 Background on ILSR

ILSR, which was established in 1974, is a non-profit organization that is funded through grants, contracts and donations. According to the ILSR web site, ILSR has helped communities across the country fight waste combustion facilities, including WTE plants:

“Our early work illustrated the environmental and economic benefits of recycling. In cities including Chicago, Los Angeles and Philadelphia, we helped citizens fight the incinerators and landfills that polluted their air and water, attracted rodents, and drove down property prices in the predominantly low-income and minority areas where waste facilities traditionally are sited.”²

Based on observations during GBB’s 30-year history and in the experience of GBB officers prior to 1980, ILRS’s success is defined by opposition to WTE facilities with little involvement promoting long-term integrated, sustainable solid waste systems. ILSR generally advances recycling alternatives and opposes WTE becoming a part of a community’s solid waste management infrastructure.

It is interesting to note the successes ILSR claims in places like Philadelphia, PA, and Washington, DC, are communities where ILSR stopped the development of WTE facilities, but now these cities haul their waste for disposal to the WTE facilities in other communities. And in some cities, such as Austin, TX, the decision to abandon WTE facilities has resulted in years of landfill disposal.

2.2 Background on Solid Waste Regulations in Florida

From the early days of solid waste regulation in Florida, the state explored the comparative advantages of recycling, WTE and landfill disposal. The following provides some background on the history of Florida’s solid waste regulation.

Florida began regulating garbage and solid waste as early as 1946 through the Sanitary Code, subject to approvals by the State Board of Health. Regulation at that time provided definitions and noted procedures and restrictions for illegal dumping and proper storage, collection and disposal, mostly aimed at alleviating any vector concerns. Municipalities were tasked with providing for an “adequate, efficient, and sanitary system of collecting, transporting, and disposing of garbage and rubbish from all buildings and establishments creating garbage or rubbish throughout the municipality.”³

By 1966, the State Board of Health Sanitary Code had expanded to include many more definitions as well as discussion of incineration, composting, and disposal of pathological wastes. Although municipalities were still saddled with the responsibility to provide garbage collection, other persons, firms, corporations, and governmental bodies or agencies became recognized as potential providers of collection and/or disposal services for garbage, and

² <http://www.ilsr.org/recycling/history.html>.

³ Florida State Sanitary Code, Chapter XXXI, Garbage and Rubbish, February 16 1946, (accessed 1/23/09) ftp://ftp.dep.state.fl.us/pub/reports/62-701/FloridaSWRegulations_eff02-16-1946.pdf.

were directed to manage these services in a “completely nuisance free” manner as provided in the Code.⁴

After that time, the name of the Florida state agency in charge of solid waste regulations changed somewhat frequently as new governmental functions were developed. New rules were promulgated by the new agencies, although often not deviating much, if any, from the rules in place under the prior agency name.

In 1976, the “State Resource Recovery and Management Program” was enacted, requiring certain counties and municipalities to adopt and submit by July 1, 1979, for department approval, a local Resource Recovery and Management Program. The proposed program(s) could be developed independently by a single jurisdiction or jointly among multiple entities. However, if such a program were deemed not economically feasible for a jurisdiction, and justification was made to that effect, participation was not required. Ultimately, responsibility for the program fell upon the County, if no joint program or leadership was established. Program requirements tasked entities to “adequately provide for the receiving in bulk, storage, separation, processing, recovery, recycling, or disposal of solid waste generated or existing within boundaries of the county or incorporated limits of the municipality or in the area served thereby.”⁵ Documentation to be included in the program involved items such as: description of existing solid waste management practices; population; solid waste generation sources, quantities, and characteristics; description of a preferred solid waste management system; and a comparison of current versus preferred system.

Detailed guidelines were enhanced in May 1979, dictating provisions for solid waste quantity guarantees to resource recovery facilities such that “local agencies that undertake construction and operation of a material or energy resource recovery facility should guarantee delivery of solid wastes generated within their jurisdiction to insure uninterrupted facility operation. Such assurances must be supported by adequate authority, or by contracts with local collection services, or as a condition of inter-local agreements.”⁶

In 1988, the Florida State Legislature passed the Solid Waste Management Act (SWMA) which outlined a broad framework for state and local actions in dealing with solid waste, including establishing a 30% goal, to be achieved by the end of 1994, for recycling of county waste. In addition, counties, as the designated primary responsible party, were required to implement recycling programs designed to recover a majority of the “Five Materials” for recycling: aluminum cans, steel cans, newspaper, plastic bottles, and glass containers. The SWMA also mandated that certain types of containers achieve a 50%

⁴ Rules of State Board of Health, Sanitary Code of Florida, Chapter 170C-10, Garbage and Rubbish, November 25, 1966, (accessed 1/23/09) <ftp://ftp.dep.state.fl.us/pub/reports/62-701/CH170C-10.pdf>.

⁵ Florida Administrative Code Chapter 17-7.25 - Resource Recovery and Management, effective November 16, 1976 (accessed 1/26/09) ftp://ftp.dep.state.fl.us/pub/reports/62-701/FloridaSWRegulations1966_1997_eff05-25-1979.pdf.

⁶ Florida Administrative Code Chapter 17-7.251 – Resource Recovery and Management, effective May 25, 1979. (accessed 1/26/09) ftp://ftp.dep.state.fl.us/pub/reports/62-701/FloridaSWRegulations1966_1997_eff05-25-1979.pdf.

recycling rate or be subject to an advance disposal fee.⁷ All counties were required to initiate their programs by July 1, 1989, a requirement with which they all complied.⁸

Required annual reporting to the state of each county's solid waste program results allowed the preparation of a report on the state's solid waste management efforts as a whole. However, in 1993, the 30% recycling goal was modified to exempt counties with populations under 50,000, which applied to almost half the state's counties. Even so, compliance still eluded over half of eligible counties through the late 1990s. In addition, by that time, none of the counties had met the "Five Materials" recycling goal. The 1993 revisions to the SWMA, excluding smaller counties, also attempted to change the county-assigned recycling goal to a waste reduction goal; however resulting statutory language was unclear and resulted in uncertainties surrounding the ultimate program aims.⁹

In the late 1980s, Florida landfills accounted for 75% of waste disposal, while 21% was disposed of in resource recovery facilities, and only 4% was recycled.¹⁰ In 1997, landfill disposal accounted for 46% of the waste stream and resource recovery facilities were used for 16%, while state-wide recycling had surpassed the original county-level goal and reached 38%. However, counties having resource recovery facilities utilized them for 38% of the disposal needs.¹¹

By 1994 and continuing through the 1990s, with 13 WTE facilities, Florida had more resource recovery capacity installed and operating than any other state. The 1993 Florida State Legislature established criteria for determining new resource recovery capacity needs and promoted integration with other waste management techniques. In addition, resource recovery facility emissions were scrutinized in a legislature-funded study based on the effectiveness of waste cleaning and source reduction techniques.

Beginning January 1, 1995, all handlers of recovered material (recyclers) in Florida who managed 600 or more tons of material per year were required to become certified and provide an annual report to the Florida Department of Environmental Protection (FLDEP).

Throughout this period of intense solid waste program planning, Florida supported local government implementation of statute-mandated solid waste and recycling programs with generous grant funding. The foresight of the 1988 state legislature in creating the Solid Waste Management Trust Fund provided for these continued activities.

⁷ These requirements were modified or repealed after 1993. "Review of the Solid Waste Management Act, Interim Project Report 2006-121"; The Florida Senate Committee on Environmental Preservation, September 2005.

⁸ "Solid Waste Management in Florida, 1989 Annual Report"; Florida Department of Environmental Regulation, Division of Waste Management, October 1, 1989.

⁹ "Solid Waste Management in Florida"; Florida DEP, Bureau of Solid and Hazardous Waste Division of Waste Management, January 1995.

¹⁰ "Solid Waste Management in Florida, 1989 Annual Report"; Florida Department of Environmental Regulation, Division of Waste Management, October 1, 1989.

¹¹ "Solid Waste Management in Florida"; Florida Department of Environmental Regulation, Division of Waste Management Bureau of Solid and Hazardous Waste, July 1999.

Florida's 75% Goal

The Energy, Climate Change, and Economic Security Act of 2008 included Section 403.7032, Florida Statutes, establishing a new statewide recycling goal of 75% to be achieved by the year 2020. The Statute directed the Florida Department of Environmental Protection (DEP) to develop a program designed to achieve this goal, which was submitted to the legislature for approval in January 2010. The report was not approved by the legislature but House Bill 7243 was passed by the Florida Legislature in 2010, addressing several of the issues discussed in DEP's report.

In specifying how recycling rates should be calculated, House Bill 7243 states, "In order to promote the production of renewable energy from solid waste, each megawatt hour produced by a renewable energy facility using solid waste as a fuel shall count as one ton of recycled materials and shall be applied toward meeting the recycling goals set forth in this section. If a county creating renewable energy from solid waste implements and maintains a program to recycle at least fifty percent of municipal solid waste by a means other than creating renewable energy, that county shall count two tons of recycled material for each megawatt hour produced. If waste originates from a county other than the county in which the renewable energy facility resides, the originating county shall receive such recycling credit. Any county that has a debt service payment related to its waste to energy facility shall receive one ton of recycled materials credit for each ton of solid waste processed at the facility. Any byproduct resulting from the creation of renewable energy does not count as waste."

House Bill 7243 required revisions to some DEP rules related to recycling, including what materials would count toward the 75% recycling goal. DEP was in the process of appointing an Ad Hoc Technical Advisory Group to help develop a methodology for calculating and crediting WTE production when an executive order suspending rulemaking was issued in January 2011 and the appointment process halted.

Conversations continue between stakeholders regarding proposed changes to House Bill 7243, including the provision giving counties with debt service additional recycling credit and the provision excluding ash from processed solid waste from being counted as waste.¹² However, as House Bill 7243 is legislatively set, not set by rule, the ability to count WTE tonnage as recycling will remain in effect unless it is addressed in the current legislative session. According to DEP calculations, Palm Beach County's 2009 traditional recycling (not including WTE credits) of 35 percent would increase to 113 percent with the new WTE credits.¹³

Current Status of Landfilling

Table 1 illustrates the extent to which large Florida counties, including Palm Beach County, still rely on landfilling to meet their waste disposal needs. Significant growth in these

¹² Telephone conversation with Ron Hendricks, Florida Department of Environmental Protection, April 8, 2011.

¹³ "County Municipal Solid Waste Recycling Rates (2009) (in descending population order)," Florida Department of Environmental Protection, received via email from Ron Hendricks, April 8, 2011.

counties since the 1980s has required large amounts of waste to continue to be landfilled, creating an even greater need for increased recycling and resource recovery facilities.

Table 1. Selected Florida County Waste Management Methods, 2008 Tonnages¹⁴

County	Recycled		Combusted in Resource Recovery		Landfilled		Total
	Name	Tons	Percent	Tons	Percent	Tons	Percent
Broward	629,450	24	787,607	30	1,227,415	48	2,644,472
Hillsborough	769,015	37	489,482	39	790,980	39	2,049,477
Lee	519,953	43	358,449	29	339,342	28	1,217,744
Miami-Dade	801,935	21	750,893	20	2,216,855	50	3,769,683
Palm Beach	656,204	31	656,628	31	792,055	38	2,104,887
Pinellas	605,841	34	481,965	27	691,137	39	1,778,943

2.3 Sustainable Solid Waste Management Systems

For the record, GBB is of the opinion that sustainable recycling should be a leading element in any local solid waste management strategy and system, and that significant diversion from disposal can be achieved and sustained. However, there are many factors that contribute to sustainable waste management systems in any community. Solid waste management is a service that needs to be reliable, efficient, and environmentally sound, with minimal impact on the community, while conserving resources to the greatest extent possible within the economic means of a particular community.

The Authority's goal is to have a sustainable, cost-effective, integrated solid waste management system that is self-reliant, cost-effective and efficient, while preserving landfill space and avoiding shipping waste to out-of-County landfills. Siting new landfills in the County is neither desirable nor readily achievable.

Integrated solid waste management is a system to manage solid waste through a combination of techniques and programs. There are significant benefits that accrue to the Authority's solid waste management system by adding capacity to its WTE facility. Chief among these is extending the life of the County's landfill to at least 2048 by reducing by 90% the volume of waste sent there, as well as additional production and sale of electricity. Further, metals recovery at the WTE facility results in significant quantities of metals being diverted from disposal. Another overlooked benefit of resource recovery facilities compared with landfills for disposal is the reduced need for space to dispose of ash versus the area needed to landfill waste.

There is a common misperception that WTE is not compatible with recycling. In fact, studies have shown that communities with WTE facilities are likely to have recycling rates at

¹⁴ Florida DEP, "2009 Solid Waste Annual Report."

least 5 percentage points above the national average. Far from competing with recycling, WTE is part of an integrated approach to solid waste management that includes recycling as a core component.¹⁵

There are also reduced pollution benefits from burning solid waste since it is a fuel with generally lower sulfur content and emissions than electricity generated from coal-fired powered plants. Electricity generation in Florida is among the highest in the United States. Natural gas and coal are the leading fuels for Florida's electricity production, typically accounting for about 40% and 30% of net generation, respectively.¹⁶ In fact, combusting 1,000 tons of solid waste saves the burning of about 1,600 barrels of oil or 500 tons of coal. And, while much of the oil Americans use is imported, solid waste is an inexhaustible alternative "domestic fuel."

From an economic perspective, because WTE facilities produce power, energy sales help offset operations and maintenance expenses, as well as construction costs. And, since most associated expenses are fixed, a WTE facility promotes long-term stabilization of waste disposal costs and facilitates more accurate financial planning for the future. WTE also enables a community to use its landfill about 10 times longer. Purchase of massive amounts of land for new landfills can then be made less frequently and planned over longer time periods. With proper maintenance, repairs, and replacements, a well-run WTE facility should last indefinitely.

Throughout the United States, there are many excellent examples of cities, counties, or solid waste districts achieving high recycling or diversion rates, some even higher than Palm Beach County's rate. However, it is important to note when comparing other communities' results and plans with the Authority's system that few other solid waste systems serve an area comprised of as many municipalities and unincorporated areas that each have the ability to decide what their recycling rules and regulations will be and how they will participate in an authority-type disposal system that has been put in place for their collective benefit. The Authority provides services to Palm Beach County comprising 38 individual municipalities and an unincorporated area. Each of the 38 cities has different policies and regulations as well as fee systems for solid waste and recycling collection services.

In this document, we address the concerns and questions raised by the ILSR and Florida Sierra Club, highlighting specific results from communities mentioned by ILSR and the Sierra Club as well as other communities whose systems or results are notable.

3.0 Communities with High Diversion Rates

The following communities, which were mentioned in the letter from the Florida Sierra Club and the document from ILSR, have higher than average recycling rates. These communities have adopted what are generally considered to be best practices that include Pay-as-You-

¹⁵ www.energyrecoverycouncil.org/userfiles/file/2009Berenyirecyclingupdate.pdf.

¹⁶ [www.eia.gov/state/state-energy-profiles-analysis.cfm?sid=FL\[4/7/2011](http://www.eia.gov/state/state-energy-profiles-analysis.cfm?sid=FL[4/7/2011).

Throw (PAYT) and composting. Three of these communities use landfills for disposal of non-recyclable waste, while one city, Worcester, MA, relies on a WTE facility.

3.1 King County, Washington

Key points: King County highlights the benefits of aggressive recycling and diversion coupled with a PAYT system for commercial and residential customers, using franchised haulers. Although the County has a 60.8% diversion rate when organics recycling is included, the County’s landfill is expected to reach capacity in 12-13 years, and when this occurs, the County has plans to rail haul waste to landfills 300 to 600 miles away and may consider a WTE facility as well.

Overview

King County has oversight of contracted/franchised garbage and recycling collection and disposal services in the County’s unincorporated areas and in 37 of the 39 cities in the County, excluding Seattle and Milton. Seattle provides its own services, and Milton is included in Pierce County’s system. Municipalities make their own arrangements for residential collection services or leave it to residents to subscribe to licensed haulers. Commercial collection is also an open market subscription type service.

King County has been able to demonstrate economies of scale in its service offerings and thus has been able to keep the suburban cities as part of the County system. The collection of garbage and recyclables in the County is provided by private haulers, except in Enumclaw and Skykomish, which operate their own collection systems. There are also many self-haulers that use the County’s network of convenience centers. The population of the cities and the unincorporated areas in the County is shown in Table 2.

Table 2. Estimated Population and Housing Data in King County, Excluding City of Seattle¹⁷

Jurisdiction	Population	Single-Family Units	Multi-Family Units	Mobile Homes
Unincorporated	343,180	102,820	16,184	6,728
Incorporated	979,270	246,689	152,003	12,341
Total	1,322,450	349,509	168,187	19,069
<small>Sources: Office of Financial Management (OFM) April 1 Population of Cities, Towns, and Counties and 2009 Housing Unit Inventory by County Used for Allocation of Selected State Revenues.</small>				

In the early 1960s, King County established a transfer system that was visionary and is still in place, although more recently, the County has been adding new transfer stations and making improvements to existing facilities.

¹⁷ Source: “2009 Solid Waste Division Annual Report”; King County Department of Natural Resources and Parks, Solid Waste Division, April 2010; http://your.kingcounty.gov/solidwaste/about/documents/SWD_annual_report-2009.pdf.

Rates Charged

In order to encourage recycling, municipalities and private haulers generally use a PAYT system for residential and commercial customers. The County system is an enterprise fund system solely dependent upon revenue from its customers.

The County's tipping fee is competitive when compared with tipping fees in neighboring jurisdictions but relatively high when compared with other areas along the west coast. The Interlocal Agreements currently in place require term extension to cover the future system the County needs to move toward. Table 3 shows the 2008 fees charged at the County's facilities.

Table 3. Selected Fees – Solid Waste Disposal, Recycling, and Unsecured Loads, Effective 1/1/2008¹⁸

	Basic Fee	Moderate Risk Waste Surcharge	WA State Refuse Tax (3.6%)	Total
Solid Waste Disposal Fees				
Per-ton Fee	\$ 95.00	\$3.50*	\$3.55*	\$ 102.05
Minimum Fee (covers up to 320 pounds)	\$15.31	\$1.34	\$.60	\$17.25
Recycling Fees				
Appliances for Recycling - Limit three per load				
refrigerant type	\$24.00	N/A	N/A	\$24.00
Other large	\$10.00	N/A	N/A	\$10.00
Clean Wood Only for Recycling (Enumclaw, Shoreline Recycling and Transfer Station only)				
Per-ton fee	\$82.50	N/A	N/A	\$82.50
Electronics (CD, DVDs, & VCRs only) for Recycling - Limit ten per load (Shoreline Recycling and Transfer Station only)				
CD, DVD, VCRs	\$5.00 ea.	N/A	N/A	\$5.00 ea.
Fluorescent Bulbs and Tubes for Recycling - Limit twelve of each type per load (Shoreline Recycling and Transfer Station only)				
Per bulb or tube	\$.80	N/A	N/A	\$.80
Yard Waste Only for Recycling (Cedar Falls, Enumclaw and Shoreline Recycling and Transfer Station only)				
Per-ton fee	\$82.50	N/A	N/A	\$82.50
Unsecured Load Fees				
Passenger licensed vehicles	\$3.00	N/A	N/A	\$3.00
Trucks < or = to 8,000 pounds licensed gvw	\$5.00	N/A	N/A	\$5.00
Trucks > or = to 8,000 pounds licensed gvw	\$10.00	N/A	N/A	\$10.00

¹⁸ www.kingcounty.gov/solidwaste/index.asp.

Diversion Rate

The County provides a comprehensive set of award-winning waste reduction, reuse, and recycling programs and education services that help its customers achieve high diversion rates. In particular it promotes curbside collection service for recyclables and organics as a means to keep garbage rate increases at a minimum and to reduce the amount of garbage. Residents save money on garbage bills by reducing the number and size of garbage containers and by recycling mixed paper, newspaper, cardboard, plastic, yard waste, food scraps and food soiled paper.

Tables 4 and 5 show the results for curbside residential recycling in the County. The data show that with organics diversion, residential properties are diverting 60.8 % of waste set out for collection.

Table 4. 2009 Single-Family (1-4 units) Curbside Collection – Average Pounds per Month (Excludes Seattle) ¹⁹

Area	Garbage	Recycling	Organics
Unincorporated	127	52	119
Incorporated	110	58	120
Countywide	114	57	120
¹ Data for City of Enumclaw not available.			

Table 5. 2009 Single-Family Curbside Recycling Tonnage (Excludes Seattle) ²⁰

	Mixed Paper	News-Print	Card-Board	Glass	Tin & Steel	Alum.	Plastic	Organics	Total
Unincorporated	9,551	4,636	4,529	3,870	604	389	1,821	25,731	51,132
Incorporated	28,424	13,766	14,385	11,594	1,805	1,171	5,430	110,111	186,687
Total	37,975	18,402	18,914	15,464	2,409	1,560	7,252	135,842	237,819
¹ Data for City of Enumclaw not available.									

Disposal

King County operates multiple facilities for the disposal or recycling of solid waste and household hazardous waste. The County's Solid Waste Division (SWD) operates eight transfer stations and two drop-off locations in the County. These facilities accept municipal solid waste (MSW) from residents and businesses. Limited recycling services are available for residential customers. The SWD also operates two facilities that accept household hazardous waste from residents: the Wastemobile and the Factoria Household Hazardous

¹⁹ Source: "2009 Solid Waste Division Annual Report"; King County Department of Natural Resources and Parks, Solid Waste Division, April 2010; http://your.kingcounty.gov/solidwaste/about/documents/SWD_annual_report-2009.pdf.

²⁰ Ibid.

Waste Drop-Off Service. Waste collected at these sites is recycled or disposed of properly. Table 6 shows the 2009 tonnages for each of the transfer facilities.

Table 6. 2009 Tons Disposed at King County Transfer Facilities²¹

Transfer Stations & Drop Boxes	Total Tons	% Self-Haul	% Commercial
Algona	141,770	27%	73%
Bow Lake	270,139	17%	83%
Cedar Falls Drop Box	3,602	100%	0%
Enumclaw	20,903	58%	42%
Factoria	139,811	19%	81%
Houghton	151,538	20%	80%
Renton	66,356	23%	77%
Shoreline	45,502	38%	62%
Skykomish Drop Box ¹	840	70%	30%
Vashon	7,766	70%	30%
Total	847,386	23%	77%

¹ Solid waste transported from Skykomish to the Houghton station; this row not added to totals.

The only remaining landfill in King County, the 920-acre Cedar Hills Regional Landfill, is located in Maple Valley, about 20 miles southeast of Seattle. Owned by King County and operated by the County Solid Waste Division (SWD), approximately 850,000 tons of waste were disposed of at Cedar Hills in 2009.

Cedar Hills Regional Landfill is projected to last until at least 2018.²² The SWD recently completed an environmental impact statement that examined approaches to extending the life of the Cedar Hills landfill by as much as 12 to 13 years.²³ The County has yet to make a decision regarding what will replace it when it is full.²⁴

The County's Comprehensive Solid Waste Management Plan directs that when the Cedar Hills Regional Landfill reaches its permitted capacity, King County will transition to waste export (the long-hauling of waste to an out-of-County landfill). However, the 2009 update of the Comprehensive Solid Waste Management Plan considered other options for long-term disposal, including WTE. The City of Seattle and neighboring counties are already exporting their waste.

In 2007, the County conducted a review of waste export and conversion technologies disposal options. The focus was on rail haul of waste out of the County when its Cedar Hills Regional Landfill reaches capacity. There also has been limited local interest to investigate

²¹ Ibid.

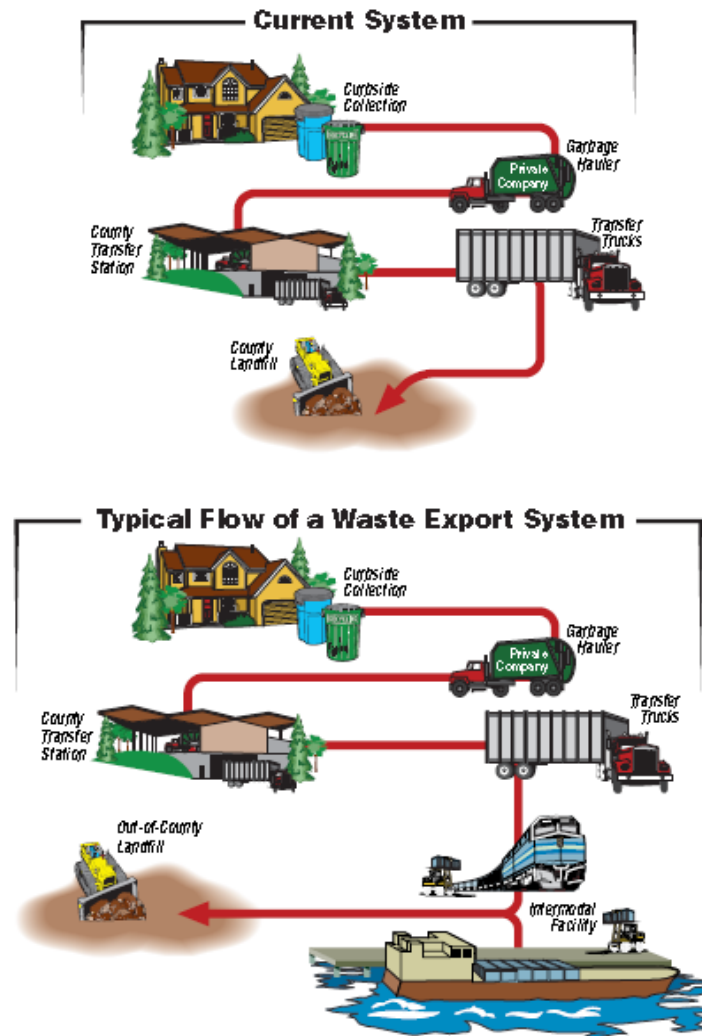
²² "Draft - 2009 Comprehensive Solid Waste Management Plan"; King County Department of Natural Resources and Parks, Solid Waste Division, October 2009.

²³ "Final - Environmental Impact Statement Cedar Hills Regional Landfill 2010 Site Development Plan"; July 2010, King County Department of Natural Resources and Parks, Solid Waste Division, July 2010.

²⁴ Source: "Comparative Evaluation of Waste Export and Conversion Technologies Disposal Options," King County Department of Natural Resources and Parks Solid Waste Division, June 2007 by R.W. Beck.

WTE and thermal processing options. In the 2007 waste export and conversion technologies report, it was projected that in-County mass-burn WTE would cost \$42 to \$58 per ton, while out-of-County rail haul to landfills some 300 to 600 miles away would cost \$43 to \$47 per ton. The current and future systems are depicted in Figure 1 below.

Figure 1. King County Current and Future Waste Export System²⁵



3.2 San Francisco, California (City and County)

Key points: While San Francisco’s recorded 75% diversion rate is high, it should be noted that most of the City’s garbage is hauled to a landfill 55 miles east of the City, and the City is looking at an alternative landfill site even further away with trucking and rail haul. (Note about California’s methodology for determining diversion rates: EPA defines diversion rate for any particular year as the percentage of waste materials diverted from traditional disposal such as landfilling or incineration to be recycled, composted, or re-used. California modified this approach by using a standard formula to

²⁵ <http://your.kingcounty.gov/solidwaste/about/documents/system.pdf>.

offset changes in a jurisdiction's population and economic conditions between the base year [1990] and the measurement year for total waste stream, assuming that without the adjustment method, population growth and economic booms would result in lower diversion rates. As of 2007, California Integrated Waste Management Board uses a per capita rate to determine compliance with statewide recycling goals. This methodology results in higher diversion rate than EPA's methodology.)

Overview

San Francisco (population 805,235), using California's methodology (described above) to calculate the waste stream, has met its goal of diverting 75% of its waste from landfill disposal by 2010 and is striving to achieve zero waste by 2020.

The Department of the Environment oversees solid waste services for San Francisco, including the "Fantastic 3" collection program for recycling, composting and trash offered to all residents (approximately 330,000 households) and businesses in San Francisco. San Francisco collects single stream recyclables (including paper, glass, plastic and metal) in blue bins; food scraps (including meat, fish and bones), plant trimmings, soiled paper and other compostables in green bins; and garbage in black carts, all on a weekly basis. San Francisco offers bulky item collection free to residents once a year for apartment tenants and twice a year for households. A fee-based bulky waste pickup program, "Recycle My Junk," is offered to residential, multi-family and commercial customers for larger or more frequent pickups.

The City passed a Mandatory Recycling and Composting Ordinance, requiring residents and businesses to separate their waste stream into recyclables, compostables and garbage. Businesses and multi-family property managers are required to provide color-coded separation options to their employees and tenants.

San Francisco's Department of the Environment also promotes waste reduction and reuse through a variety of programs, including encouraging producers to take responsibility and implementing bans on Styrofoam and plastic bags, and the disposal of construction and demolition debris.

Rates Charged

San Francisco uses a PAYT rate structure to encourage recycling. As of July 1, 2010, the basic monthly rate for the weekly collection of waste from a black 32-gallon garbage cart is \$27.55 (\$330.60 per year). Recyclables in blue and green carts are picked up at no additional charge. Customers who recycle enough to consistently reduce weekly garbage volumes to 20 gallons or less are eligible for a \$21.21 per month (\$254.52 per year) 20-gallon mini-can. Additional waste that does not fit into a cart can be disposed of for \$27.55 per collection for up to 32 gallons.

Diversion Rate

San Francisco reports achieving a 75% diversion rate in 2010. This is an increase from its 72% diversion rate in 2009. San Francisco has a variety of effective waste diversion programs and services: PAYT, recycling and composting. However, San Francisco still relies

on out-of-County landfills to dispose of significant quantities of waste. Its reported 70+% diversion calculation uses California methodology that is not comparable to the way others calculate recycling or disposal for a specific year. California's methodology generally results in overstated diversion as compared with calculations of recycling quantities as a percentage of total waste generation (recycling plus disposal).

Disposal

Recyclables are sent to Recycle Central, located at Pier 96 on San Francisco's Southern waterfront, where they are separated into commodities for sale to manufacturers.

Over 400 tons of compostable materials are sent each day to a composting facility near Vacaville, CA, approximately 65 miles northwest of San Francisco. The materials are composted in outdoor windrows into a nutrient-rich soil amendment.

Once collected, garbage is hauled to the San Francisco transfer station. Most of the garbage is hauled in transfer trucks to Altamont Landfill in Alameda County, approximately 55 miles east of San Francisco. The remainder of the materials is hauled to other nearby landfills. While San Francisco has almost five years of landfill capacity left on its existing contract at Altamont, solid waste officials are currently in the process of looking at an alternate landfill site in Dixon, CA, approximately 70 miles northwest of San Francisco. Proposed transport of materials to this alternate landfill includes trucking materials approximately 12 miles northeast to Oakland and then rail hauling the material to the Ostrom Road Landfill. The proposed tip fee at Ostrom Road Landfill is \$28.53, much lower than the \$66.79 proposed by Altamont Landfill.

3.3 Worcester, Massachusetts

Key points: Worcester highlights the fact that municipal disposal at a WTE facility is fully compatible with a higher than average recycling rate. Worcester is a city that has a 43% recycling/diversion rate, a PAYT program and waste disposal at a WTE facility.

Overview

Worcester (population 176,000, 63,588 households) residents of single-family homes and multi-family complexes with fewer than six dwellings receive municipal collection for both garbage and recyclables. However, residents may opt out of municipal collection and contract separately with one of the waste haulers serving the City.

Residents who receive municipal collection under the City's variable rate (PAYT) Yellow Trash Bag program use bags, available for purchase from retailers, with 15-pound and 30-pound weight limits. With the City's new Zero Sort (single-stream) recycling program, these customers use recycling bins to set out commingled recyclables (cardboard, newspapers, mixed paper, glass bottles and jars, bi-metal cans, aluminum foil, aluminum cans, plastic jugs and bottles, and milk and juice cartons.) Massachusetts is a bottle bill state so some aluminum is diverted from the waste stream through returns, but the

recycling contractor, Casella, claims the amount is negligible. The City has three drop-off sites for yard waste, which is composted and offered free to City residents.

Rates Charged

The City does not assess a flat fee for solid waste services. Residents purchase yellow trash bags for garbage disposal, which are available in two sizes:

- 15-gallon bags -- \$.75 each, \$7.50 for a roll of 10
- 30-gallon bags -- \$ 1.50 each, \$7.50 for a roll of 5

The City contracts for trash collection from multi-family complexes with more than six dwellings, businesses and institutions.

Diversion Rate

According to the 2008 Municipal Residential Recycling Summary²⁶, Worcester's residential recycling rate (total tons diverted) is 43%. In 2008, total reported tonnage figures were as follows:

- Total tons generated -- 61,335
- Total tons disposed -- 35,079 (Millbury WTE facility)
- Total tons recycled -- 9,496
- Total tons composted --16,624
- Total tons hazardous products -- 137

Disposal tonnage from businesses/institutions or C&D is not included in these figures.

Disposal

Worcester's non-recyclable waste is disposed at Wheelabrator's 1,500 TPD Millbury, MA, mass-burn WTE facility, which serves 40 Massachusetts communities. GBB estimates that Worcester's contribution of waste to the Millbury facility to be less than 10%. Electricity generated goes into the power grid. Recyclables are processed at the Casella Material Recovery Facility (MRF) in Auburn, about four miles from the City. Yard waste is composted by the City and offered free to City residents.

²⁶ www.mass.gov/dep/recycle/priorities/wrr.htm.

4.0 Outcomes from Some of the Communities with Which ILSR Has Worked

In the following communities, ILSR states that it has “changed the direction of solid waste management.”²⁷ In each of these jurisdictions, WTE was considered, but ultimately plans for WTE facilities were abandoned. It is instructive to view the diversion rates of these communities, which have been essentially stalled.

4.1 Austin, Texas

Key points: Austin is an example of a city that considered a WTE facility, but did not proceed. The City’s recycling rate has been stalled in recent years, and it is only now, with a plan to achieve zero waste by 2040 (Zero Waste Plan), that Austin is poised to move to the next level in diversion. In the meantime, Austin’s non-recyclable waste has been landfilled. The number of permitted landfills in the Austin region has declined from 13 in 1990 to six today.

Overview

The City of Austin (population 774,000) and its Solid Waste Services Department are responsible for City-wide collection of trash/garbage from 163,965 residential customers and 2,603 commercial customers, which includes small multi-family dwellings of four units or less, and a limited number of small businesses. The City also offers bi-weekly curbside recycling to its customers with collection of corrugated cardboard, mixed paper, aluminum and bi-metal cans, glass and plastics #1 and 2. Yard trimmings are collected at the curb in bags on the same day as garbage and recycling collection. There is no organics collection.

While the City is responsible for single-family garbage and recycling collection, most multi-family residences, businesses and institutions must contract with private haulers for these services. Only businesses with 100 or more employees and multi-family complexes with 100 or more residents must provide recycling.

Rates Charged

The City uses a variable rate (PAYT) system for residential garbage collection, with unlimited single-stream, cart-based collection for recycling and unlimited yard trimmings collection. The following garbage cart sizes and rates are offered:

- 30-gallon cart -- \$13.50 per month (\$162 per year)
- 60-gallon cart -- \$18.75 per month (\$225 per year)
- 90-gallon cart -- \$27.95 per month (\$335.40 per year)
- Bags of extra garbage that do not fit in the cart are required to have a \$4 (+ tax) sticker.

²⁷ See Appendix A: Source: ILSR document prepared for the Florida Sierra Club, March 2011.

All residential customers also are charged a \$5 (annual) anti-litter fee that covers the HHW facility, street sweeping, dead animal collection and enforcement of certain City codes.

Austin's solid waste system is self-supporting.

Diversion Rate

Austin's diversion rate is 30.8%, according to the City of Austin's 2010 Integrated Solid Waste Management Master Plan (November 2010). In FY2009, 1,000,000 tons of waste were collected:

- 249,500 tons controlled by City
- 677,900 tons controlled by private sector
- 72,600 self-haul tons

According to the Master Plan, 445,300 tons were diverted. (Data based on Austin's Zero Waste Plan and EPA estimates)

In December 2008, the City adopted a Zero Waste Strategic Plan with the goal to divert 90% of its waste from landfills and incinerators by 2040 and achieve a 20% reduction per capita by 2012. In order to increase diversion from the commercial sector, in November 2010, the Austin City Council approved changes to the current Commercial/Multifamily Recycling Ordinance. The new Universal Recycling Ordinance, which becomes effective October 1, 2012, will require more than 4,500 properties to recycle by October 2015.

Disposal

Recyclables are direct hauled to the new TDS materials recovery facility (MRF) near Creedmore, TX. As part of its Zero Waste Plan and long-range plan for 2010-2050, the City is considering the addition of three new facilities: a composting facility that could process 1,000 TPD and two 500 TPD mixed materials processing facilities.

For non-recyclable waste, the City previously had its own landfill, which is now closed. Like many other Texas cities, Austin is part of a regional system of landfills, transfer stations and citizen collection stations. As of 2008, the 10-county Capital Area Council of Governments had six permitted landfills receiving waste, four of which are in the Austin area. The majority of Austin's waste is sent to the Texas Disposal Systems Landfill, BFI/Allied Sunset Farms Landfill, and Waste Management Inc. Austin Community Landfill. Lesser amounts go to IESI Travis County Landfill and Williamson County Landfill.

Yard trimmings are co-composted with biosolids at the Hornsby Bend wastewater treatment plant.

4.2 Washington, DC

Key points: Washington, DC, considered constructing a WTE facility in 1986 and again in 1994, but abandoned the project. However, the District decided to send its residential and yard waste to the WTE facility in Fairfax, VA, where it continues to go. DC's residential recycling rate was 24% in 2009, and 34% when recycling tonnage from the commercial sector is included.

Overview

Washington, DC, with a population of nearly 600,000, provides solid waste services through the Department of Public Works to single-family homes and small multi-family buildings with up to three units (approximately 103,000 households). These services include weekly collection of single-stream recyclables from 32-gallon blue mini-carts (or recycling bins in areas with narrow alleys) and weekly garbage collection using 96-gallon carts. A few sections of the City receive twice-a-week collection using 32-gallon mini-carts. Up to seven bulky items are collected by appointment from households receiving trash collection. Bulk items can also be dropped off at the Fort Totten Transfer Station. Up to five bags of yard waste are collected per week from households receiving garbage collection.

Since 1989, recycling of bottles, cans, and paper has been required in all commercial establishments, including multi-family buildings with four or more units. Commercial establishments are required to submit bi-annual recycling plans and pass an inspection.

Rates Charged

Residents are not directly charged for solid waste services. The DC's solid waste program includes a proposed budget of \$61,971,000 for FY2011 and the program is funded by the general fund.

Diversion Rate

The DC Solid Waste Management and Multi-Material Recycling Act of 1988 requires the recycling of at least 45% of the City's total waste stream. DC estimates its total recycling rate by combining the volume of waste and recyclables that pass through DC-owned transfer stations (including waste from residential collection) with the volume reported by commercial haulers registered with the Department of Public Works. The entire amount of waste and recyclables generated is not captured by this method, as DC does not have a closed system.

DC's residential recycling diversion rate was 24% in FY 2009, according to the Government of the District of Columbia's Public Report on Recycling for Fiscal Year 2009. A total of 138,416 tons of residential waste and 33,414 tons of residential recyclables were reported for FY2009. The addition of commercial recycling brought the overall diversion rate for DC to 34% for FY2009.

Disposal

Recyclables are collected by DC crews and taken to a Waste Management, Inc. MRF for processing and marketing.

DC has two public transfer stations and two private transfer stations within the City limits. The public transfer stations receive residential and yard waste collected by DC and private haulers. This waste is then transferred to the Fairfax County I-95 Energy/Resource Recovery Facility in Lorton, Virginia. DC sends 200,000 tons of waste per year to this facility and has a three-year agreement. This agreement is in its second year and it is anticipated to be extended. Republic and Waste Management, Inc. also use the transfer stations to take approximately 250,000 tons per year of non-residential waste to the mid-Peninsula area of Virginia (Fredericksburg, Waverly, King George County, and Queens County) for disposal in landfills.

In 1986, a 500–600 TPD WTE facility was proposed for DC. A 1,300 TPD WTE facility was again considered when DC updated its solid waste plan in 1994; however, the City decided to continue to use the WTE facility in Lorton, VA.

4.3 Philadelphia, Pennsylvania

Philadelphia is a city that considered WTE but abandoned the idea when opposition arose. Yet, 55% of the City's waste is currently hauled to out-of-city WTE facilities and 45% to landfills. The recycling rate for waste managed by the City has grown slowly to about 18%. The City's recycling rate for commercial customers served by private haulers is reported to have risen to higher levels, from 35.9% in 2006 to 50% in 2010. The City continues to investigate options to achieve its Green Works goal to divert 70% of its waste to a WTE facility that could include mass-burn or an alternative WTE technology.²⁸

Overview

The City of Philadelphia, with about 1.5 million residents, provides residential waste collection services to over 550,000 households, small businesses, municipal buildings and public housing throughout the City. Some 60 to 70 licensed haulers provide collection services to commercial customers. About 1.6 to 1.8 million tons per year are managed in the City – approximately 40% by the City and the other 60% by private haulers. Recently, the City entered into a partnership with RecycleBank, which offers monetary rewards for recycling (see description below). The City contracts for recyclables processing for the recyclables it collects from its customers.

Rates Charged

The City's Department of Sanitation has an annual budget of approximately \$100 million per year for solid waste management, which is entirely funded from the general fund. The City receives some revenues from service fees for small business services, the sale of recyclables that offset some of the costs of the services the Sanitation Department provides

²⁸ Information in this section is from Scott McGrath, AICP, Streets Department, Sanitation Division, City of Philadelphia, in email April 12, 2011.

(current rate for recycling processing with Waste Management is \$65 per ton in revenue which is adjusted quarterly based on changes in market index rates), and now savings from avoided disposal costs as a result of the Recycling Rewards program run by RecycleBank program (described below).

Diversion Rate

The City's recycling rate in 1997 was 6.4% of the 833,000 tons managed by the City. Since then, the city's recycling rate for the waste it manages has risen to about 18%. Recently the City has entered into a partnership with RecycleBank²⁹ with its Recycling Rewards Program that offers residents incentives to engage in single-stream recycling (no carts are used) and receive monetary rewards for what they recycle. Through this arrangement the City shares in the recycling reward revenue as well as in the avoided cost for disposal of waste that is now recycled as a result of this new initiative.

Disposal

The Sanitation Division collects about 2,700 tons per day of refuse which is delivered to several facilities for transfer and disposal. Note all transfer facilities are located within the City. Table 7 lists each transfer site, disposal site and type of disposal facility:

Table 7. Philadelphia Transfer and Disposal Sites

Transfer Site	Contractor	Tons Per Day	Disposal Site	Technology
TRC	Republic	700	Conestoga LF	Landfill
58 th Street	Covanta	500	Covanta	WTE
Girard Point	Covanta	200	Covanta	WTE
Forge	Waste Management	500	GROWS North	Landfill
Quickway	Waste Management	500	Wheelabrator	WTE
Northwest	City	300	Covanta	WTE

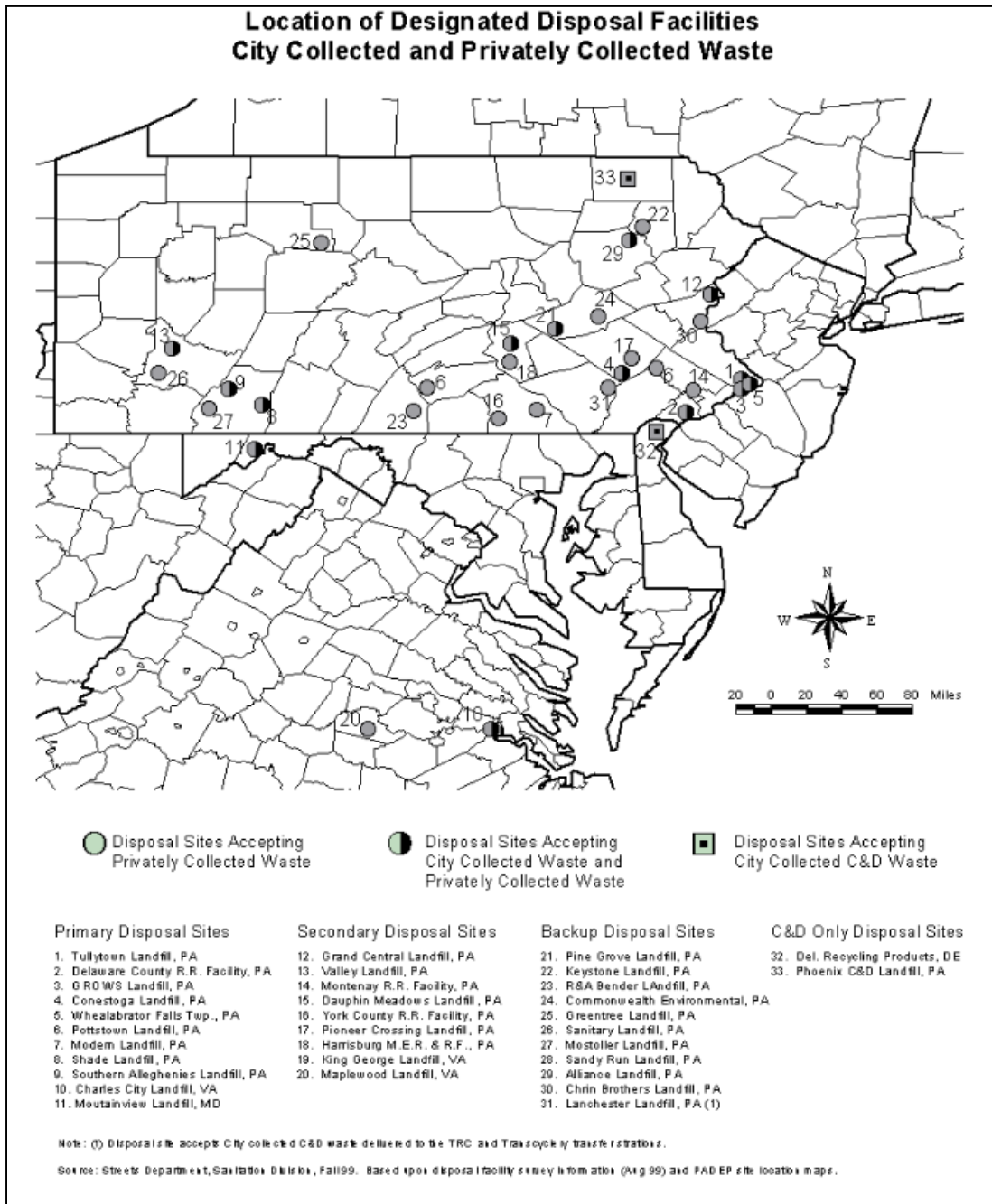
Currently about 55% of the City-collected waste is delivered to traditional mass-burn WTE facilities and 45% is landfilled. The City continues to investigate options to achieve its Green Works goal to divert 70% of the City's waste to a WTE option that could include traditional mass burn technology or an alternative WTE technology.

The Covanta facility generates 0.6 MW/hr of power per ton or about 120,000 MW/hr of energy per year from waste collected by the City of Philadelphia. The City's blended disposal rate for all contracts is about \$66 per ton.

Figure 2 shows the location of disposal facilities for MSW collected by the City and private collectors.

²⁹ See www.recyclebank.com and www.phillyrecyclingpays.com.

Figure 2. Philadelphia Waste Disposal Facilities



During the 1980s, the City sought to implement a WTE facility located at the Philadelphia Navy Yard. Opposition to this project stopped it. In prior years, the City owned incinerators which reduced the amount of waste requiring land disposal. After the passage of the Clean Air Act of 1970, those incinerators were closed and converted to transfer stations. By 1975, landfill disposal became the primary means of disposing of City waste. By 1984, all but one

transfer station, the City's Northwest Transfer Station, was closed. The City utilizes privately operated transfer stations under contract to deliver its waste to disposal sites.

5.0 Communities with Current or Proposed WTE Facilities

The next sections of this document address the specific concerns and questions raised by the ILSR and Florida Sierra Club. The Authority provided input on responses, and GBB provided additional information. The questions or concerns appear in italics.

Concern:

If the plant operated according to vendor stipulations, there could still be significant subsidies for the County. In Montgomery County, MD, a mass-burn plant is operating according to design, yet the tip fee and energy revenue do not cover all costs. The County must pay \$30 million annually. The subsidy requires Montgomery County to impose a household surcharge to cover shortfalls.

Response:

The Authority and its budget are separate and distinct from the "County," and there are no circumstances under which Palm Beach County would be required to fund any portion of the Authority's operations or activities. Second, paying the operator its contractually agreed-to fees for running the privatized operation of the Authority-owned facility cannot be considered a "subsidy." Further, this concern fails to account for the most significant benefit of the facility, namely reducing the volume of waste being landfilled by 90%, and greatly extending the life of the existing landfill.

Financing mechanisms that the Authority has in place are sound. The Authority has a credit rating of AA, which is the highest of any comparable organization of its type in the United States. For 20 years, the Authority has operated the existing system, which includes a WTE facility, and the Authority's financial condition is very strong.

5.1 Montgomery County, Maryland

Key points: Montgomery County, MD, has an award-winning integrated solid waste management system with a 44% recycling rate and a WTE facility. Montgomery County's solid waste system does not rely on the general fund for financial support; rather, County residents and businesses pay a "System Benefit Charge" that appears on their property tax bills. The County does not pay a subsidy; its solid waste system is self-supporting. The ILSR mentions that the County's tip fee and energy revenue do not cover all the costs of the system – but no system generates more revenues than it has in costs. While some system elements do generate revenues (e.g., sale of recyclables, sale of electricity from WTE facility), in the end, all solid waste management systems are cost systems.

Overview

Montgomery County (2009 population 971,600) has a comprehensive integrated solid waste management system for the three cities, 12 towns, four villages, and unincorporated areas that comprise of over 350,000 households, and many businesses and institutions. The elements of the County's integrated system are portrayed in Figure 3.

The County adopted a goal to reduce solid waste and achieve (or exceed) a recycling rate of 50% by 2010. To achieve this goal, the County adopted a policy that establishes a hierarchy of solid waste management options. The most preferred management option is the reduction of solid waste at its source. The second preferred solid waste management technique is recycling and reuse of solid waste. The third tier option is combustion of solid waste with the recovery of electrical energy at the Resource Recovery Facility (RRF), which was developed, financed, and is owned and managed by the Northeast Maryland Waste Disposal Authority. The least preferred method of managing solid waste is landfilling. The County has sized its facilities to handle the County's current and projected waste.

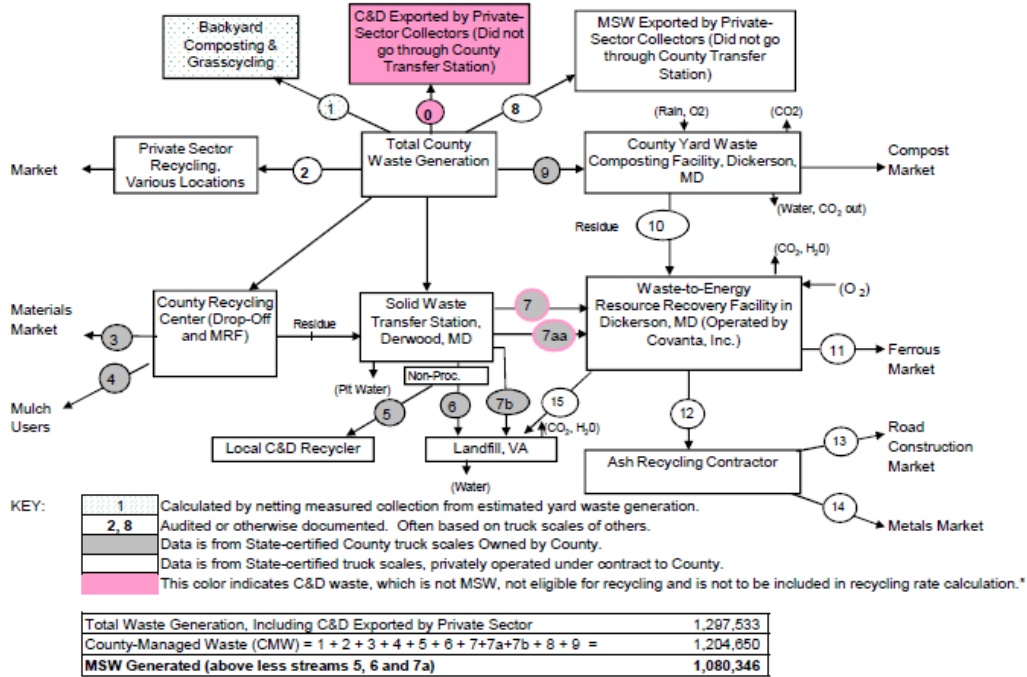
The County's solid waste management hierarchy recognizes the interdependence of all elements of an integrated solid waste management system. To realize its recycling goals, the County has implemented a policy of Countywide (non-municipal) curbside collection of recyclable materials and established a policy favoring purchase of recycled materials.³⁰ The County has adopted regulations requiring recycling at residential, non-municipal multi-family residential (apartment) and commercial properties^{31,32} and has numerous programs to promote and further achieve its recycling goals. The County has also adopted a ban on all recyclables at any County's solid waste disposal facilities.

³⁰ Chapters 48 and 11B-56, Montgomery County Code.

³¹ The City of Gaithersburg adopted the County's regulations for multi-family and commercial recycling in 2005.

³² In September 2008, the City of Rockville adopted the same regulations.

Figure 3. County Integrated Solid Waste Management System Elements, Tonnages and Recycling Rate FY2010



Stream No.	Material Description	Sources of Data	Total (tons/yr)	Comments
0	Construction & Demo Debris Private Export	Licensed Collector Reports under ER 92-59	92,883	Not County-managed and not eligible for recycling
1	Yard Waste Source Reduction	Calculated w/ estimates & measurements	13,825	17.5% of MSW less leakage less yard waste facility tons
2	Recycled via non-County Facilities	Collector, Processor, Business & Self-Hauler Rpts.	224,973	Filtered to avoid double-counting
3	County Recycling Facility Material Sales	County TS & MRF Scales, Outbound	87,423	Outgoing to Market from County Recycling Center
4	Mulch Loaded Out From TS	County Transfer Station (TS) Scale Records	61,138	Scaled Out As Taken to Mulch Preserve Locations
5	Non-Processibles Recycled**	County TS Scale Out Records	38,298	
6	Non-Processibles Land filed**	County Trans. Stn. & Covanta Scale Records	21,514	
7	Loaded on Rail to RRF (MSW burned)	Covanta Scales as Loaded	469,489	Total Tons Loaded on Rail to RRF Net of 7a
7a	Loaded on Rail to RRF (C&D Burned)	County Transfer Station (TS) Scale Records	66,491	In-Bound C&D less Outbound Non-Processibles Landfilled
7b	By-pass (Accepted Processible Land filed)	County TS Scale Out Records	-	
8	Refuse Disposed Out of County	Audited 6-Mo. Hauler Reports	151,149	Private Sector MSW Collection not delivered to County TS
9	All Incoming Leaves and Grass	Compost Facility & TS Scale Records	72,349	Includes 0 to Backup Composters
10	Composting Residue to RRF	Covanta Scale Records	-	
11	Ferrous recovered at RRF	Covanta Scale Records	11,653	
12	Ash Loaded to Ash Recycling Contractor	No ash recycling at this time.	-	No ash recycling at this time.
13	Non-Metal Outgoing from ash Recycler	No ash recycling at this time.	-	No ash recycling at this time.
14	Metals (Fe, Cu, Brass, Coins)	No ash recycling at this time.	-	No ash recycling at this time.
15	All ash not recycled	Covanta Scale Records	153,516	

Recycling Rate Calculations		Numerator	Denominator	Rate
County Recycling Rate		471,361	1,080,346	43.6%
County Recycling Rate "Without Ash"		471,361	1,080,346	43.6%
State Recycling Rate		451,160	1,080,169	42.0% ***
State Recycling & Reduction Rate		451,160	1,080,169	47.8%
EPA Recycling Rate		451,185	1,080,169	42.0% ***

Notes:

- ** Nonprocessibles are Construction & Demolition-type materials; not eligible for recycling credit, but are County-managed solid waste.
- *** For State and EPA methods, numerator and denominator exclude motor oil

Nomenclature:

- "C&D" means "Construction and Demolition" waste, exclusive of MSW, traditionally managed by the private sector, but much now comes to County TS.
- "CMW" means "County Management Waste". It includes all MSW, whether or not exported by private sector collectors, but only C&D delivered to TS.
- "MSW" stands for "Municipal Solid Waste", and represents the waste eligible for recycling under the State recycling law, regulations and guidelines.
- "TS" stands for the County's "Transfer Station", located in Derwood, Maryland, just south of Gaithersburg.

The County's solid waste management hierarchy is fully consistent with the Maryland's solid waste management hierarchy. By shifting the focus of solid waste management to reduction and recycling, the County strives to reduce the solid waste remaining for disposal. This helps the County reduce its reliance upon land within the County for landfilling. Further, by combusting solid waste, the volume of material required to be landfilled is reduced 70% by weight and 90% by volume. This approach is consistent with the County's comprehensive land use plan: "A General Plan for the Maryland-Washington Regional District in Montgomery and Prince George's Counties," which provides the comprehensive planning

and policy framework for land use, growth management, and resource management in Montgomery County.³³

This County's plan acknowledges the existence of certain solid waste facilities and establishes that the County "provide an adequate, self-sufficient, well-monitored, and ecologically sound system for the management of Montgomery County's solid wastes."^{34, 35}

Rates Charged

The County has established a self-sustaining enterprise fund that relies solely on revenues from its customers and the sale of products. There is no subsidy provided by the County's General Fund revenue. Table 8 illustrates the rates and fees charged to both single-family and commercial enterprises.

Table 8. FY11 Approved Solid Waste Service Charges

FY11 APPROVED SOLID WASTE SERVICE CHARGES TO BE COLLECTED VIA REAL PROPERTY ACCOUNT BILLING									
Code Reference	Base Charge (\$/ton)	x	Billing Rate (tons/HH)	Disposal Charge	Base		Incremental		Total Bill
					48-32(c)(2)	48-8A(b)(2)(A)	48-8A(b)(2)(B)	48-29	
SUBDISTRICT A (Refuse Collection District)*									
Inside Leaf Vacuuming District	\$ 56.00		0.92925	\$ 52.04	\$ 41.43	\$ 116.38	\$ 74.00	\$ 88.91	\$ 372.76
Outside Leaf Vacuuming District	\$ 56.00		0.92925	\$ 52.04	\$ 41.43	\$ 116.38	\$ 74.00		\$ 283.85
Incorporated					\$ 41.43				\$ 41.43
SUBDISTRICT B SINGLE-FAMILY**									
Incorporated					\$ 41.43				\$ 41.43
Inside Leaf Vacuuming District									
Unincorporated	\$ 56.00		0.92925	\$ 52.04	\$ 41.43	\$ 116.38		\$ 88.91	\$ 298.76
Outside Leaf Vacuuming District									
Unincorporated	\$ 56.00		0.92925	\$ 52.04	\$ 41.43	\$ 116.38			\$ 209.85
MULTI-FAMILY RESIDENTIAL**									
Incorporated					\$ 6.90	\$ 9.52			\$ 16.42
Unincorporated									
Outside Leaf Vacuuming District					\$ 6.90	\$ 9.52			\$ 16.42
Inside Leaf Vacuuming District					\$ 6.90	\$ 9.52		\$ 3.83	\$ 20.25
NONRESIDENTIAL - \$/2,000 SQ. FT. ***									
Code Reference									
Waste Generation Categories									
Low					\$ 104.61	\$ 0.43			\$ 105.04
Medium Low					\$ 313.83	\$ 1.29			\$ 315.12
Medium					\$ 523.04	\$ 2.14			\$ 525.18
Medium High					\$ 732.26	\$ 3.00			\$ 735.26
High					\$ 941.48	\$ 3.86			\$ 945.34
OTHER APPROVED FY 11 SOLID WASTE FEES									
Base Solid Waste Charge under Section 48-32(a)(1):									
(This is known as the "Tipping Fee") \$56.00 /disposal ton									
Waste delivered for disposal <500 lb loads in privately owned and operated vehicles or trailers <1,000 capacity per Section 48-32(c)(2):					Recyclable Materials Acceptance Fees (Section 48-32(a)(2)):				
					Paper and Commingled Containers \$0.00 /ton				
					Yard Trim \$40.00 /ton				
Waste delivered in open-top roll-off box \$60.00 /disposal ton					Miscellaneous (48-31(f)): Compost Bins \$0.00 each				

Note: Base System Benefit Charges are set to cover County Base System Costs net of Disposal Charges.

** With respect to Base and Incremental System Benefit Charges, this category includes dwellings in buildings of six or fewer households.

*** The Nonresidential rate multiplied by the total number of 2,000 square foot units of enclosed area equals the nonresidential charge.

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For residential customers served by the County, user fees are made up of several components. There is a System Benefit Charge (SBC) and components related to the collection services residents receive depending on where located in the County. The incorporated cities (Rockville and Gaithersburg) provide their own residential services and may choose to use the County system for recycling processing and/or disposal services. The County contracts for residential collection services and requires these contractors to

³³ See Section 2.3 of this Plan for a fuller discussion of the County's General Plan.

³⁴ "A General Plan Refinement of the Goals and Objectives of Montgomery County," Maryland National Capital Park And Planning Commission, December 1993.

³⁵ "Comprehensive Solid Waste Management 10 Year Plan, 2009-2019", Montgomery County, Maryland DIVISION OF SOLID WASTE SERVICES, Department of Environmental Protection, Division of Solid Waste Services, 2/9/2010.

deliver waste and recyclables collected to the County's facilities without additional charge. The County's all-in rates to its residential customers for FY 2011 ranged from \$284 to \$373 per year; the latter rate is for customers who receive curbside leaf vacuuming service. Over the recent years, since the County's RRF/WTE has been in place, residential rates have been very stable.

Table 9 shows residential rates for properties that do not receive curbside leaf vacuum collection service.

Table 9. Montgomery County Single-Family Annual Rates, without Leaf Vacuum Collection Service³⁶

Fiscal Year	Montgomery County Residential Annual Rates, without Leaf Vacuum Collection
1998	\$263
2000	\$265
2002	\$231
2004	\$243
2006	\$262
2008	\$264
2011	\$284

For commercial customers, the SBC is based on the customer's waste generation level, ranging from \$105 to \$945 per year, as shown in Table 7. Commercial collection services are open market, provided by a large number of private haulers. If the customer's hauler decides to use the County's disposal system, an additional tipping fee is charged. The current charge at the transfer station is \$56.00 per ton.

With these rates, coupled with the revenues derived from the sale of materials and electricity, the County fully supports its solid waste management system, requiring no subsidy from the general fund.

Diversion Rate

The County has a robust and growing recycling system. As mentioned earlier, the County has a 50% recycling goal and has made steady progress. The County's recent recycling rates³⁷ are shown in Table 10.

³⁶ "Comprehensive Solid Waste Management 10 Year Plan, 2009-2019," Montgomery County, Maryland Division of Solid Waste Services, Department of Environmental Protection, February 9, 2010.

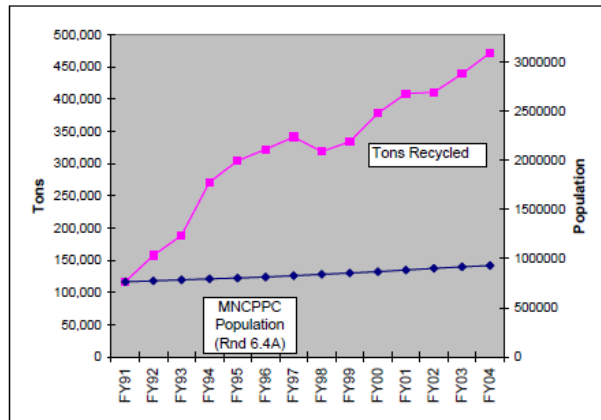
³⁷ <http://www.montgomerycountymd.gov/swstmpl.asp?url=/content/dep/solidwaste/reference/index.asp>

Table 10. Montgomery County Recycling Tonnages and Rates, 2003 – 2010

Fiscal Year	Tonnages	% Recycling
2003	439,166	37.1
2004	471,952	37.6
2005	517,433	41.0
2006	520,466	41.7
2007	528,187	43.2
2008	553,501	44.3
2009	495,371	44.2
2010	471,361	43.6

Figure 4 shows the County’s dramatic increase in recycling along with the County’s population.

Figure 4. Tons Recycled Versus Population in Montgomery County



Yard trim is brought to the County’s compost site. After composting, the material is screened, bagged and sold under the brand names Leafgro and ComPro. Figure 5 is an aerial view of the County’s compost site, which is located near the RRF that the County uses.

The County’s Compost Facility received the Solid Waste Association of North America’s (SWANA) 2005 Silver Excellence Award in the Waste Reduction, Recycling and Composting Division. This awards program recognizes technically and economically-sound municipal solid waste management programs that are protective of public health and the environment.

Figure 5. Aerial View of Montgomery County's Composting Facility



Disposal

The Montgomery County RRF is located approximately 45 miles from the nation's capital in Dickerson, MD. This facility gives the County control of its own waste disposal destiny without having to rely on the uncertainties accompanying a single disposal method. Before transport to the RRF by rail, waste is collected and taken to the Shady Grove Processing Facility and Transfer Station in Derwood, MD (in the County). The RRF is owned by the Northeast Maryland Waste Disposal Authority on behalf of the County. Covanta Montgomery, Inc. operates the facility under a 20-year Service Agreement. Figure 6 shows an aerial view of the RRF. Covanta is a member of the Maryland Department of the Environment's Maryland Green Registry. This facility received Gold Excellence Awards in SWANA's Waste-to-Energy Division in both 2005 and 2010.

Figure 6. NMWDA Montgomery County Resource Recovery Facility Aerial View



At the Montgomery County RRF, continuous monitoring systems analyze critical emissions, and send instructions to plant controls to make corrective adjustments, enabling operators to ensure compliance with strict federal and state environmental regulations. Table 11 presents emissions data for 2010, comparing performance of the RRF with permitted levels.

As can be seen, the environmental performance of the facility is excellent. The County also posts live online emissions data from the facility's continuous emissions monitoring.

Table 11. Emissions Performance for the Montgomery County Resource Recovery Facility in 2010

Montgomery County Resource Recovery Facility Emissions (tons per year)			
	Permit Level	Actual Emissions for CY2010	Percent of Permitted Level
Mercury	3.1	0.0239	0.77%
Carbon Monoxide	180	56.5	31.39%
Non-methane Hydrocarbons	31	0.9	2.90%
Nitrogen Oxides	1100	499.3	45.39%
Dioxins/Furans (PCDD/PCDF) 1989 ITEF	0.000125	4.20E-08	0.03%
Sulfur Dioxide	300	83.6	27.87%
Particulate Matter	96	21.3	22.19%
Hydrogen Chloride	140	69.1	49.36%
Lead	1.9	0.0399	2.10%

Solid waste remaining after reduction, recycling and combustion is landfilled. Disposal of RRF ash, bypass waste, and non-processible waste that cannot be recycled or reused is shipped to out-of-County landfills. Use of in-County landfilling is to occur only if cost-effective out of County landfilling options become unavailable or legislatively prohibited.

5.2 Frederick County, Maryland

Concern:

Capital costs for a three-unit 1,000 TPD mass-burn facility could be \$1 billion, based on current estimates for a 1,500 TPD plant proposed in Frederick, MD. The estimate for capital costs is \$500 million. In addition, there are \$60 million per year in costs for debt retirement and operating costs. Or, over 20 years, the Frederick plant would cost \$1.7 billion for a plant half the size planned in Palm Beach County.

Response:

If the Authority's Governing Board selects the proposer with the lowest net present value, the cost to build and operate the new WTE facility for 20 years will cost the Authority \$500 million in today's dollars excluding financing costs.

Key points: The proposed WTE facility in Frederick County will dispose waste from two counties, Frederick and Carroll and includes providing disposal services for 50,000 tons per year of biosolids from an adjacent Frederick County wastewater

treatment facility. The County's review determined that the disposal costs with the new WTE facility will be less than out-of-County landfill disposal.

Overview

Frederick County (2009 population 227,980) historically disposed of its solid waste at its Reichs Ford Landfill but more recently exports its waste for disposal in Pennsylvania. The County now has plans to build a WTE facility that will serve neighboring Carroll County, and neighboring Counties as well. The County does not provide waste collection services. These services are generally provided on an open market subscription basis for both residential and commercial customers. Only the City of Frederick and several homeowner associations provide their own services or contract for service within their areas. Frederick County provides curbside recycling collection and lidded, rolling carts, to all residents in the County and the City of Frederick. When Maryland passed recycling requirements, the County also initiated programs and services to promote recycling.

Rates Charged

The County charges tipping fees at its landfill and transfer station complex. Revenues from deliveries are augmented by a System Benefit Charge (SBC) that is charged all generators of waste in the County. The SBC currently is sized to support administration, debt service, post-closure costs for the County's landfill, transportation and disposal of waste in Pennsylvania, and other unfunded programs such as recycling. In the future, it can also support paying a portion of the charges for the future WTE facility which will replace the T&D costs. The tipping fees are set at market rates.. Current tipping fees in the County are \$76 per ton for MSW and \$85 per ton for C&D materials.

Diversion Rate

Historically, recycling in Frederick County has been reasonably robust. Table 12 shows the County's Maryland Recycling Act percentages since 2003. In 2003, about the time long-range planning for WTE began, the County's waste diversion rate was about 40%; the 2009 rate, which will soon be released, was 41.63%. Currently, the County contracts for the separate collection and processing of single-stream recyclables from approximately 56,000 households in the County. The County has a long-range goal of 70% diversion, to be coupled with the operations of the WTE facility.

Table 12. Frederick County MRA and Waste Diversion Rates 2003 through 2009

Year	% MRA Rate³⁸	Waste Diversion Rate³⁹
2003	37.90	39.90
2004	36.22	38.22
2005	34.30	36.30
2006	36.02	39.02
2007	41.32	44.32
2008	41.39	44.39

Source: Maryland Department of the Environment⁴⁰

Disposal

To preserve space at its one landfill, Frederick County has taken advantage of low-cost landfills in Virginia and Pennsylvania. In 2004, the County became a member of the Northeast Maryland Waste Disposal Authority (NWMDA) in order to manage its waste and recycling in a more cost-effective, regional manner. NWMDA procured transfer and disposal services for Frederick and Carroll Counties, and obtained rates in the low \$50/ton range. One year later, due to a spike in fuel costs, Frederick County was paying in the low \$70/ton for transfer and disposal of its waste. That price has since declined somewhat, but the experience led the County to realize that sending waste to out-of-State landfills was not a long-term, economically reliable alternative. Both Counties instituted single-stream recycling (Frederick provides collection to every resident through contracted collection; Carroll County requires any hauler in the County to offer the service to its customers). NWMDA also procured recycling processing services for Frederick County. Since January 2009, all recyclable material has been sorted by Recycle America under the contract administered by the NWMDA.

Frederick County built a transfer station to accommodate waste and single-stream recyclables. Both Frederick and Carroll Counties asked NWMDA to look at the feasibility of building an energy recovery facility. NWMDA compared the costs of 600 TPD, 900 TPD, and 1,500 TPD facilities, and determined that only the 1,500 TPD size would have net disposal costs comparable to out of state transfer and disposal. After conducting an open and public procurement for proven technologies, the Authority issued a Request for Proposal for a design, build and operate vendor. Wheelabrator was selected, and Frederick and Carroll Counties signed agreements with the Authority to develop a 1,500 TPD WTE facility to be located next to the Frederick County wastewater treatment plant in an industrial park. The facility will work in combination with their respective waste reduction and recycling programs.

³⁸ MRA Recycling Rate = $\text{MRA recycling tonnage} \div (\text{MRA recycling tonnage} + \text{MRA waste}) \times 100$.

³⁹ Waste Diversion Rate = Recycling Rate + Source Reduction (SR) Credit (based on voluntary reporting of SR activities).

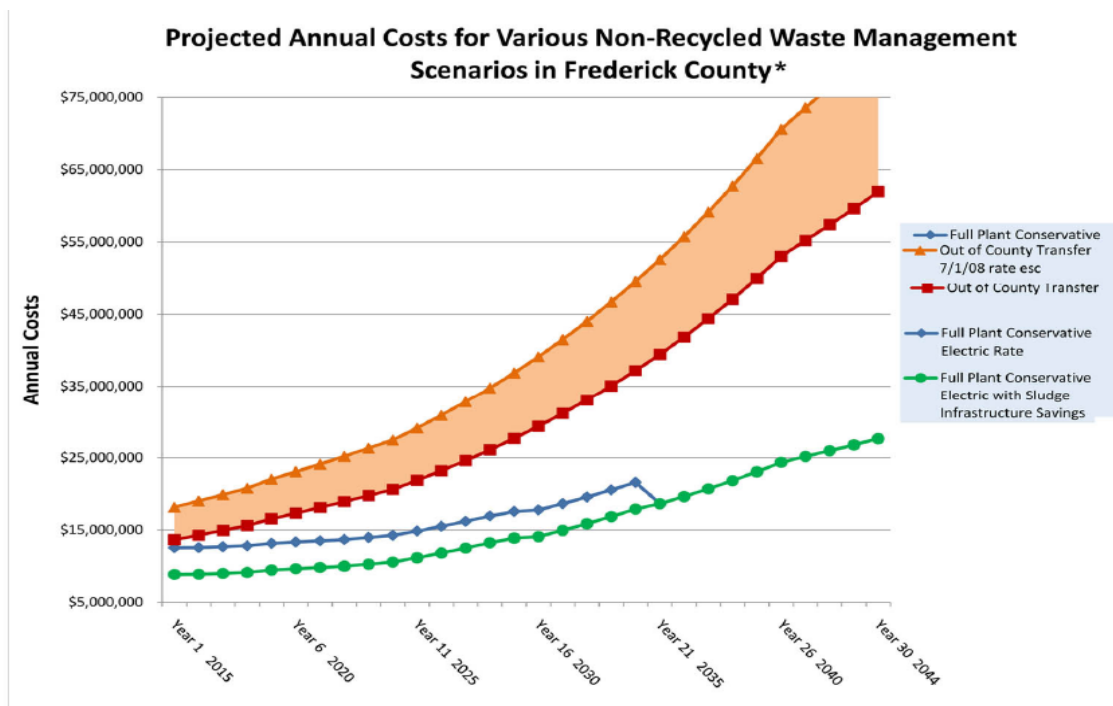
⁴⁰

<http://mde.maryland.gov/programs/Land/RecyclingandOperationsprogram/Publications/Pages/programs/landprograms/recycling/publications/index.aspx#recycling>.

The facility will produce 55 megawatts of electricity, exporting 45MW, enough to power 45,000 homes and offsetting either 130,000 tons of coal or 500,000 barrels of oil per year. The facility will also recover 15,000 tons of ferrous and non-ferrous metals for recycling. The construction price in Wheelabrator's contract price is \$322 million. Additionally, Wheelabrator is providing the project a capital loan of approximately \$80 million to be repaid during the initial 20 year operating term.

Figure 7 shows the projected annual costs for the facility versus continued reliance solely on out-of-county, long-haul transfer and disposal. Because ownership of this facility will be public, after the initial 30-year financing term, the debt service component of the service fees will be eliminated, and a significant drop in service fee is also projected. The current schedule has the counties voting on final approval in April 2012, and if positive, financing and construction can proceed, with operations beginning in summer 2015. Frederick County also retained an independent financial advisor to review the NMWDA projections and its various sensitivities. This review concluded that under the realistic scenarios, the disposal costs associated with the planned WTE facility will be substantially less for Frederick County than costs for out-of-County disposal.⁴¹

Figure 7. Cost Projections in Frederick County⁴²



* Higher out-of-county transfer costs based on actual diesel fuel values of July 1, 2008, escalated. Lower out-of-county transfer costs based on 2009 diesel fuel costs, escalated.

⁴¹ Presentation by Municipal & Financial Services Group to Frederick County, November 16, 2010; slide #36.

⁴² Northeast Maryland Waste Disposal Authority, Frederick/Carroll County Renewable Waste-to-Energy Facility Fact Sheet.

The facility is being designed with the best available technology for air pollution control. Table 13 presents the emission standards for both the European Union (EU) and the United States (U.S. EPA) compared to the facility guarantee Wheelabrator has contracted for. As listed, Wheelabrator's guarantees are well below both sets of the emission standards.

Table 13. Comparison of Emission Limits for Municipal Waste Combustors with Facility Guarantee by Wheelabrator⁴³

		EU Limit		USEPA MACT	Facility Guarantee
Emission	Basis	(Mg/dscm 7% O ₂)	Basis	(Mg/dscm 7% O ₂)	(Mg/dscm 7% O ₂)
Particulate	CEM Daily	13.1	Stack Test	20.0	12.0
Cadmium, Thallium	Stack Test	0.065	Stack Test		
Cadmium Only				0.010	0.010
Lead + Other Metals	Stack Test	0.65	Stack Test		
Lead Only				0.140	0.140
Mercury (Hg)	Stack Test	0.065	Stack Test	0.050	0.028
			Maryland Limit	0.028	0.028
SO ₂	CEM Daily	25	Or 80% removal and geometric avg.-CEM	30	26
HCl	CEM Daily	8.6	Or 95% removal – Stack Test	25	25
HF	CEM Daily	1.6	Stack Test		
CO	CEM Daily	56	CEM (4 Hr. Block)	100	100
CO	CEM ½ hour	112			
NO _x (daily)	CEM Daily	137	CEM (24 Hr. Daily)	150	110
NO _x			CEM (Annual)	90	90 ⁴⁴
VOC as methane	CEM Daily	20			
NOTE DIFFERENT UNITS*		Ng/dscm 11% O ₂		Ng/dscm 7% O ₂	
Dioxin/furan (ITEF)		0.09*	Stack Test	0.18*	0.18*
Dioxin/furan Total		5.6*	Stack Test	13*	13*

6.0 Plant Non-performance and Bailouts

Concern:

If the plant fails to operate correctly, as has happened in Dutchess County and Washington County, NY; Detroit; Harrisburg, PA; and Camden, NJ, Palm Beach County would face a financial crisis of unprecedented proportion. In New Jersey, the state had to bail out five operating mass-burn facilities with a state bond of \$1.2 billion.

Response:

⁴³ Source: Appendix 2 to the Service Contract for the Frederick County Energy Recovery Facility between Northeast Maryland Waste Disposal Authority and Wheelabrator Frederick Inc. dated January 2010.

⁴⁴ There are discussions advancing a lower NO_x emission limit of 45 ppmvd (7% O₂) for the 24 hour block average; source: R. Davidov, Northeast Maryland Waste Disposal Authority, May 2, 2011.

If the Authority's new project fails to operate correctly, the contracts will require that the contractors' financial resources, coupled with a performance and payment bond and a series of performance guarantees, adequately protect the Authority.

The Authority has successfully operated a WTE facility on this site for over 20 years, and there is no basis for concluding that the new facility will not be as successful as the existing one. Furthermore, the statement that the Camden, NJ, plant failed to operate incorrectly is wrong. The bailout was associated with changes in waste flow control and New Jersey laws.

6.1 Harrisburg, Pennsylvania

Harrisburg is an example of what can happen when political decisions and poor management put an end to a good idea. The Harrisburg Authority failed to implement a plan to retrofit the facility, which had been mismanaged and poorly maintained. Over 30 years, attempts to fix the plant were rejected for political reasons. Now, after completing a retrofit, the contractor that operates the facility is running it at 90% availability.

The Harrisburg Resource Recovery Facility (HRRF) is a mass-burn WTE facility that came on line originally in 1972 and consisted of two Martin grate mass- burn waterwall lines operating at 245 TPD, each totaling 490 TPD. The HRRF produced both electricity and steam for the downtown steam loop. It was operated by the City of Harrisburg from 1972 to 2003 and shut down in December 2000 for environmental reasons due to its obsolete air pollution control (APC) system. The City ran the HRRF at a derated load until 2003 when it was shut down for retrofit.

In 2004, Barlow Projects took over as the contractor to perform an extensive retrofit of the facility, including adding a new APC system and a third line, bringing the total capacity to 800 TPD or approximately 260,000 tons per year. Barlow was also scheduled to operate the plant after the retrofit. The retrofit project under Barlow was not fully completed, leaving the City of Harrisburg with approximately \$300 million in facility-related debt. Subsequently, the Harrisburg Authority contracted with Covanta Energy to complete the project and operate the facility for 10 years. Covanta completed the retrofit project in April 2009 and the HRRF has been operating continuously at 90% availability with Covanta serving as the operator. However, the facility still has several remaining technical issues, which need correction but for which there is no capital budget. The Harrisburg Authority owns the HRRF and has a 10-year agreement with Covanta for the operation and maintenance of the facility.

In addition, waste supply, tipping fees, and long-term performance are significant issues at this facility now. The City of Harrisburg only controls about 38,000 tons per year of waste. In 2003, the Harrisburg Authority contracted with Dauphin County to provide an additional 175,000 tons per year of waste at a contracted rate of \$35 per ton. In 2009, following the failure of the Barlow work, the Harrisburg Authority, claiming Barlow's result was an uncontrollable circumstance, unilaterally raised the County's tipping fee to \$200 per ton. As a result of seeking relief through arbitration as provided for in its service agreement, the County prevailed and agreed to pay a tipping fee of \$72.60 per ton. The City's tipping fee remains \$200 per ton. These tipping fees are not competitive with regional landfill

alternatives. Steam sales curtailed in 2007 when the steam line ruptured and was shut down. This rupture caused damage to the turbine, and the damage has yet to be repaired. The Harrisburg Authority is exploring options with the facility, including its sale, to help rectify the significant debt left behind by various decisions and poor past contractor performance of the retrofit.⁴⁵

6.2 New Jersey's Story

Key points: The bailout was not for WTE facilities alone; it also was for 31 solid waste facilities, including 12 landfills and 14 transfer stations. In fact, the WTE facilities receiving assistance comprise less than 20% of the total.

The 1975, modification to the New Jersey Solid Waste Management Act burdened counties with developing environmentally sound methods of solid waste disposal. In response, counties began to develop and/or site new waste management facilities in their communities; five of the 21 counties in New Jersey developed systems with WTE facilities. To facilitate the financing of these facilities, they utilized and interpreted sections of the Resource Conservation and Recovery Act of 1976 (RCRA) to implement waste flow control legislation, or ordinances within their communities, in which they designated where their municipal solid waste and recyclables could be taken for processing, treatment or disposal. This ensured that the facilities would receive the appropriate amount of waste to make them financially viable.

Several factors contributed to the State paying the debt associated with the WTE and other waste processing or disposal facilities. One factor was associated with changes to the State's solid waste plan, and another factor was legal challenges to the waste flow control legislation, or ordinances, implemented throughout the State – and country, for that matter.

The 1975 Amendment to New Jersey's Solid Waste Management Act (SWMA) primarily focused on establishing the basis for and implementation of the State's solid waste management plans and taking responsibility for the waste generated, but it didn't establish recycling goals. In 1987, New Jersey's Governor Kean implemented stricter recycling laws and established a 25% goal. In Executive Order No. 34, signed in June 1991 by Governor Florio, the goal was increased to 60%. Both of these changes occurred while the WTE plants began operating and accepting waste.

The legal challenges to waste flow control ordinances or legislation were not focused on New Jersey alone; they were nationwide and predominately focused on a New York case entitled *C&A Carbone, Inc. v. Town of Clarkstown*, in which Carbone challenged the Town's waste flow control ordinance. In 1994, the Supreme Court modified RCRA (*C&A Carbone, Inc. v. Town of Clarkstown, New York*, 511 U.S. 383, 114 S CT §1677 (1994)), by limiting local government entities from adopting waste "flow control" ordinances because of their effect on interstate commerce. The Supreme Court's decision made waste flow control ordinances illegal; therefore, communities or governing bodies within the State relying on these ordinances to ensure the facilities received the appropriate or guaranteed quantity of waste

⁴⁵ Source: The Harrisburg Authority, 2011.

to cover the operating and financing costs were forced to compete for waste on the open market.

The two previously mentioned factors severely affected the waste received for processing by all waste management facilities, including the WTE facilities established during the 1980s and 1990s, causing most of them to have difficulty in covering their operating and financing costs. In fiscal year 1998, New Jersey appropriated \$20 million annually through fiscal year 2001 to assist the affected counties with the \$2 billion dollars of debt that had been incurred. In 2001, the Economic Development Authority (EDA) was amended to allow counties to refinance the debt with the State being responsible for 50%. As of December 2003, the outstanding debt associated with the solid waste management facilities was \$932 million.⁴⁶

New Jersey WTE Facilities Today

New Jersey currently has five WTE facilities built during the late 1980s and early 1990s, all of which are still in operation and achieve an availability rating with industry standards of approximately 90%. Table 14 lists each facility by county and provides some basic operational information. It should be noted that all of these facilities are members of the Occupational Safety and Health Administration’s Voluntary Protection Program (VPP).

Table 14. New Jersey WTE Facilities

County	Facility Name	Operating Since	Electricity Production	Design Capacity	
				(TPD)	(TPY)
Camden	Camden Resource Recovery Facility	1991	34 MW	1,050	383,250
Essex	Essex County Resource Recovery Facility	1990	70 MW	2,800	1,022,000
Gloucester	Wheelabrator Gloucester Company, L.P.	1990	14 MW	575	209,875
Union	Union County Resource Recovery Facility	1994	45 MW	1,500	547,500
Warren	Warren Energy Resource Company	1988	13.5 MW	448	163,520
Total			176.5 MW	6,373	2,326,145

Source: Energy Resource Recovery Council

As noted in Table 14, the five New Jersey WTE facilities have a design capacity of approximately 2.3 million tons annually and produce 176.5 MW electrical capacity, sufficient to provide power to 80,000 homes. Utilizing the 2008 figures reported on New Jersey’s Department of Environmental Quality web site, the facilities have the capacity to process

⁴⁶ New Jersey Solid Waste Management Plan, 2006, Section F.

approximately 26% of the State's post-recycled waste. Table 15 shows that New Jersey's reported recycling rates are close to or in many cases exceed the goals established in 1991, which clearly indicates WTE and recycling can coexist.

Table 15. Reported Recycling Rates in New Jersey WTE Counties

County	Reported Figures		
	Total Waste Generated	Total Recycling	% Recycled
Camden	1,005,296	541,483	54%
Essex	1,781,824	1,097,406	62%
Gloucester	714,373	421,851	59%
Union	1,481,558	895,278	60%
Warren	261,735	164,010	63%
Total	5,244,786	3,124,003	60%

Source: New Jersey Department of Environmental Quality

6.3 Camden, New Jersey

Key points: ILSR's statement that the Camden, NJ, WTE facility failed to operate correctly is incorrect. In fact, the bailout had nothing to do with the operation of the facility. Instead, the bailout was associated with changes in waste flow control and New Jersey laws. It is important to note that New Jersey communities with WTE have high recycling rates, demonstrating that the WTE and recycling are complementary waste management strategies.

Camden County shares solid waste management responsibility with the Pollution Control Financing Authority of Camden County. The County is responsible for planning and recycling, and the Authority operates the Pennsauken Landfill and oversees the operation of the Camden Resource Recovery Facility (CRRF). Further, municipalities arrange for residential collection services, while commercial collection is open market.

Construction of the CRRF was completed by Foster Wheeler in March of 1991 and the plant began commercial operation. The CRRF is owned and operated by a subsidiary of Foster Wheeler, Camden County Energy Recovery Associates (CCERA). The CRRF consists of three 350 TPD waterwall units with a total capacity of 1,050 TPD – approximately 345,000 tons per year – and has an electrical generation capacity of 27 MW. The CRRF was financed with bonds issued by the Pollution Control Financing Authority of Camden County. CCERA assumed the responsibility of paying the debt service on the bonds using the revenues from the tipping fees charged for waste disposal and electrical revenues. Waste flow to the CRRF was guaranteed under the New Jersey waste flow control laws then in effect in 1991.

In 1997, the U.S. Supreme Court, in its Carbone decision, invalidated the New Jersey laws. As a result the tipping fees needed to be reduced to market levels to maintain the supply of fuel for electrical generation. Since 1999, the State of New Jersey has provided subsidies

sufficient to ensure the payment of each project. In Camden's case, the subsidy included some debt associated with the landfill and debt service payments as they came due. At that time, the tipping fee at the CRRF was \$94.00 per ton and the market rate was approximately \$50.00 per ton. The subsidy of the WTE facility continued during the period of 1999 through 2010 when the final debt service payment was made. Overall, \$300 million was paid by the state for Pollution Control Financing Authority debt service payments during 1999 through 2010. In 2001, a new agreement was negotiated between the Pollution Control Financing Authority and CCERA, which will run through 2031. In conformance with this agreement, the Pollution Control Financing Authority requested debt restructuring assistance from the Economic Development Authority and modified the County solid waste plan to include waste flow control, now allowed as a result of the U.S. Supreme Court reversing its Carbone decision with its Oneida-Herkimer decision in 2007. As noted earlier, the repayment of the bonds issued by the Pollution Control Financing Authority was completed in 2010.

The original air pollution control system for CRRF included spray dryer absorber, electrostatic precipitators and carbon injection. In 2010, CCERA initiated the upgrade of the control of NOx emission with the addition of selective non-catalytic reduction technology on all three trains. This upgrade will reduce NOx emissions by about 20%.

In 1995, Camden County had a population of approximately 505,000 and generated 877,131 tons of solid waste. Of this total, 441,909 tons were recycled for a recycling rate of 50.4%. 1995 MSW recycling was 169,733 tons or 36.2%. In 2008, the population increased to approximately 510,000 and solid waste also increased to 1,005,295 tons with 541,483 tons recycled or 53.9%. 2008 MSW recycling was 179,204 tons or 32.1% recycling. In the years between 1995 and 2008, the recycling rate varied between 45% and 55%.

The current MSW tipping fee disposal rate at the CRRF is \$65 per ton and the MSW rate at the Pennsauken Landfill is \$96 per ton. These rates became effective on April 1, 2010. There is also Construction and Demolition (C&D) waste being disposed of at the Pennsauken Landfill which is charged \$33 per ton and other solid wastes, including, industrial, vegetative, bulky, food and animal are charged \$96 per ton. Bypass waste from the CRRF is charged \$65 per ton at the landfill, the same as the CRRF tipping fee.

7.0 Exemplary Florida Communities with WTE Facilities

7.1 Lee County, Florida

Key points: Lee County is an example of a community with an integrated solid waste system that includes WTE and still values finding higher uses for many materials. The County has achieved high levels of diversion and has made recycling some materials mandatory for businesses and multi-family complexes.

Overview

According to Lee County's (population 586,908, 152,900 single-family households) web site, during the past 16 years the County has developed its solid waste system to be one of the nation's most successful and sustainable recycling and solid waste management systems. Lee County has consistently reported from 35% to 42% of documented recycling activities for more than 12 years and is listed as Florida's top county for recycling success in 2008 (latest DEP reporting year). Including waste processed for energy recovery from the WTE facility, Lee County has already exceeded Florida's 75% recycling goal.⁴⁷

Lee County provides weekly curbside collection of unlimited amounts of garbage, recyclables, and yard waste to residents in the unincorporated portion of the County, the City of Bonita Springs, and the Town of Fort Myers Beach through three franchised haulers. Bulk waste is collected via request at no additional cost.

Single-stream recycling is collected in 64-gallon carts in portions of the unincorporated Lee County, the City of Bonita Springs and the Town of Fort Myers Beach. Customers in other parts of the County continue to use recycling bins for their materials. The County also provides commercial collection through the three franchised haulers.

In 2007, the County implemented mandatory recycling for all businesses within the unincorporated areas of Lee County for, at a minimum, the one material generated in the greatest quantity at each business. All multi-family properties in the County are required to provide collection systems for paper, glass, plastics, metal and aluminum cans, white goods, and electronic devices. Construction and demolition debris recycling is also mandatory in the County and administered through the assessment and refund of diversion fees.

Rates Charged

Solid waste assessments are included in the annual property tax bills for all properties, both residential and commercial. Assessments range from \$190.03 - \$222.63, based on the location of the property.

Diversion Rate

The County reports a recycling rate of 43% for 2008 based on the following tonnages:

- 358,449 WTE
- 519,953 recycled
- 339,342 landfilled
- Total managed: 1,217,744 tons

Recyclables

Lee County owns a 400 TPD MRF in Fort Myers. Recyclables are taken to this facility for processing and marketing.

⁴⁷ <http://www3.leegov.com/solidwaste/default.htm> (accessed April 7, 2011).

Yard Waste

Yard waste collected in Lee County is processed into mulch that is made available to residents for pick-up at one of six locations.

Disposal

WTE

All residential garbage collected in Lee and Hendry counties is disposed at the award-winning Lee County Resource Recovery Facility. Commercial operation of the 1,200 TPD facility began in December 1994. In 2007, a third boiler was added to increase the plant's capacity to 1,836 TPD with energy production of 53 gross megawatts of power. A transfer station, located at the WTE facility, is used to transport ash and bypass waste to the Lee/Hendry Landfill in Felda, FL, owned by the two counties.

7.2 Hillsborough County, Florida

Key points. Hillsborough County operates an exemplary solid waste system anchored by a WTE system. The County recently expanded its WTE capacity but still has a solid commitment to an integrated solid waste management system, which thus far has achieved 38% diversion.

Overview

Hillsborough County's (population 1,200,541) Solid Waste Management Division (SWMD) is responsible for the overall operation of the Hillsborough County Integrated Solid Waste Management System (System), which provides for the collection, transportation, and disposition of all of the solid waste generated or brought into the system service area. The system includes the resource recovery facility (RRF), Southeast County Landfill, transfer stations, community collection centers, recycling services, household chemical collection centers, and the yard and wood waste processing facilities. The RRF burns up to 1,200 tons of solid waste daily and produces enough electricity to power 15,000 homes.

Hillsborough County provides curbside solid waste collection (garbage, recyclables and yard waste) for single-family homes located in the unincorporated area and the Tampa Palms and Hunters Green areas. The cities of Tampa, Temple Terrace and Plant City have their own collection services for residential and commercial garbage and recyclables, although Plant City's collection from the commercial sector is limited to old corrugated cardboard. The County has contracts with three franchised haulers for private residential and commercial solid waste collection. Curbside collection includes:

- Two garbage collections per week (up to three 35-gallon containers each collection day)
- One recycling collection per week, with materials separated into dual streams
- One yard waste collection per week (up to twelve 30-gallon containers)

Residents are required to separate yard waste from garbage for collection. Bulk waste can be collected curbside by the franchise hauler or can be taken to any of five community collection centers free of charge with a current tax bill showing solid waste assessments.

For commercial collection services, three franchise collectors have the exclusive right to compete for the commercial business anywhere in the system service area. Commercial customers are free to negotiate cost and service terms with any of the three franchise collectors.

Rates Charged

All residences are charged annually for residential collection services on their property tax statements. There are two charges: Solid Waste Disposal Assessment (\$96.15 for 2011) and Solid Waste Collection Assessment (\$135.02 for 2011), for a total current annual cost of \$231.17.

Diversion Rate

The County reports a recycling rate of 38% for 2008 based on the following tonnages:

- 489,482 WTE
- 769,015 recycled
- 790,980 landfilled

Recyclables

The three franchised haulers take curbside recyclables to local materials recovery facilities. Republic Waste Services utilizes Smurfit-Stone Recycling in Tampa, while Waste Services, Inc. and Waste Management of Tampa take their recyclables to Recycle America of Tampa.

Yard Waste

Yard and wood waste are size-reduced with a tub grinder by a private contractor at the County's three processing facilities. The size-reduced yard waste is windrowed and recycled as mulch, soil amendment or fuel by the same private contractor.

Disposal

WTE

A key element of Hillsborough County's system is the RRF, which burns solid waste that can be processed, produces steam, and converts the steam into electricity, which is sold to the Tampa Electric Company. Construction of the 1,200 TPD mass-burn RRF was completed in 1987 at a cost just over \$80,000,000 by Ogden Martin Systems of Hillsborough, Inc. An expansion in 2009 increased the facility's capacity to 1,800 TPD of solid waste, with 46.5 megawatts of renewable energy produced. While the County owns the facility, Covanta is responsible for the operation of the RRF.

In addition to the generation of electricity, the ash residue generated as a result of the incineration process is cycled through a magnetic separation process where the metals are separated and then recycled. The remaining ash residue is transported to the Southeast County Landfill, where it is either landfilled or used as daily cover.

Transfer Stations

In order to provide more convenient disposition alternatives for processable solid waste, the system utilizes two transfer stations, which are operated by the SWMD: the Northwest County Transfer Station located in the northwest part of the County and the South County Transfer Station located in the southern part of the County. The transfer stations receive loads of processable solid waste in varying sizes; consolidate them into tractor trailer size loads (approximately 18 tons); and then transport the larger loads to the RRF, or when necessary, to any one of a number of designated diversion facilities. In addition to providing more convenient service to system customers, the transfer stations also serve to reduce the amount of vehicular traffic at the RRF and the SCLF.

Class I Landfill

Class I landfill disposal is provided at the county-owned Southeast County Landfill (SCLF), which is the only public Class I landfill in Hillsborough County. Opened in 1984, the 179-acre SCLF is constructed over the clay residue from a phosphate mining operation. These clays serve as the liner for the SCLF. Generally, the SCLF receives non-processable solid waste (solid waste which is unacceptable for disposal in the RRF, such as bulky items, construction and demolition debris, etc.); ash from the RRF and the City of Tampa WTE facility; shredded tires; and, when necessary, diversions from the RRF and the transfer stations. The SCLF is operated by Waste Management, Inc. of Florida in accordance with a "life-of-site" contract with the County.

8.0 States That Do Not Permit WTE

Concern:

Massachusetts and New York have determined that incineration of garbage is not in the best interests of their respective states. Massachusetts has maintained its moratorium on garbage incineration. New York State has issued a technical report documenting the advantages of the alternatives to incineration.

Response:

8.1 Moratorium in Massachusetts

Key point: There currently are seven permitted WTE facilities in Massachusetts, which together process roughly 38% of the municipal solid waste generated in the state, and produce and sell steam, power and recovered materials.⁴⁸

⁴⁸ www.mass.gov/dep/recycle/solid/mwcbabout.htm

Massachusetts has had a moratorium on certain forms of disposal since 1990. In 2000, the state lifted the moratorium for landfills, but maintained the moratorium on construction of new municipal waste combustion facilities. The Commonwealth plans to meet its waste management capacity need with increased recycling and composting, rather than with long-term disposal capacity.

8.2 New York Technical Report

While the New York technical report cited by ILSR shows preference to alternatives to landfill disposal, it clearly states that WTE is a “preferable method” to dispose of waste that cannot be diverted in other ways.

The referenced technical report from New York’s Department of Environmental Conservation, “Beyond Waste: A Sustainable Materials Management Strategy for New York State,” states that “When properly designed and operated, MWC [municipal waste combustion] is the preferable method of disposal of waste that remains after waste prevention, reuse, recycling and composting programs have been maximized. These facilities produce electricity, which represents a small contribution to meet the demand for electricity and efforts to reduce New York State’s dependence on fossil fuels ... A recent study comparing MWC and landfill gas to energy on a life-cycle basis found that MWC can generate an order of magnitude more electricity than landfill gas to energy, given the same amount of waste handled.”⁴⁹

It is interesting to note that New York City has adopted a strategy of waste export. Virtually all of its waste is sent to landfills in Pennsylvania, Ohio, Virginia, North Carolina and South Carolina. With this disposal method, it appears that the City has decided that dumping solid waste up and down the eastern seaboard is superior to managing its waste within its own boundaries.

In 2010, Jason Post, deputy press secretary on environmental issues for New York City’s Mayor Bloomberg, told a New York Times reporter, “It (WTE) is not currently being pursued – not because of the technology, which has advanced, but because of the issue in selecting sites to build incinerators. It’s a NIMBY (not in my backyard) issue. It would take years of hearings and reviews.”⁵⁰

The Authority has consistently concluded that Palm Beach County will manage the waste generated in Palm Beach County and not burden others near and far with its solid waste disposal. If New York City were equally committed to managing its own waste within its borders, the City probably would have built WTE facilities long ago.

⁴⁹ “Beyond Waste Plan,” New York State Department of Environmental Conservation, pp. 188-189.

⁵⁰ http://www.nytimes.com/2010/04/13/science/earth/13trash.html?_r=1

9.0 National and International Support for WTE

9.1 EPA Includes WTE in Its Waste Management Hierarchy

The U.S. Environmental Protection Agency recognizes the vital role the nation's WTE industry plays in managing the nation's solid waste. EPA places incineration with energy recovery on its hierarchy of waste management methods, higher than landfilling disposal/incineration without energy recovery, and below source reduction/reuse and recycling.

The U.S. Conference of Mayors' U.S. Mayors Climate Protection Agreement, signed by more than 900 mayors, supports a 7% reduction in greenhouse gases from 1990 levels by 2012 and recognizes WTE technology as a means to achieve that goal. In addition, the newly formed Global Roundtable on Climate Change (GROCC) unveiled a joint statement on February 20, 2007, identifying WTE as a means to reduce carbon dioxide emissions from the electricity-generating sector and methane emissions from landfills.⁵¹

9.2 Kyoto Protocol

The ability of WTE to mitigate climate change also is recognized internationally. WTE projects can be afforded offset status under the Kyoto Protocol's Clean Development Mechanism by displacing fossil fuel-fired electricity generation and eliminating methane production from landfills. The Intergovernmental Panel on Climate Change acknowledges that "incineration reduces the mass of waste and can offset fossil-fuel use; in addition greenhouse gas emissions are avoided, except for the small contribution from fossil carbon." This acknowledgement by the IPCC is particularly relevant due to the IPCC being an independent panel of scientific and technical experts that shared the Nobel Peace Prize with Al Gore.⁵²

9.3 WTE in the European Union

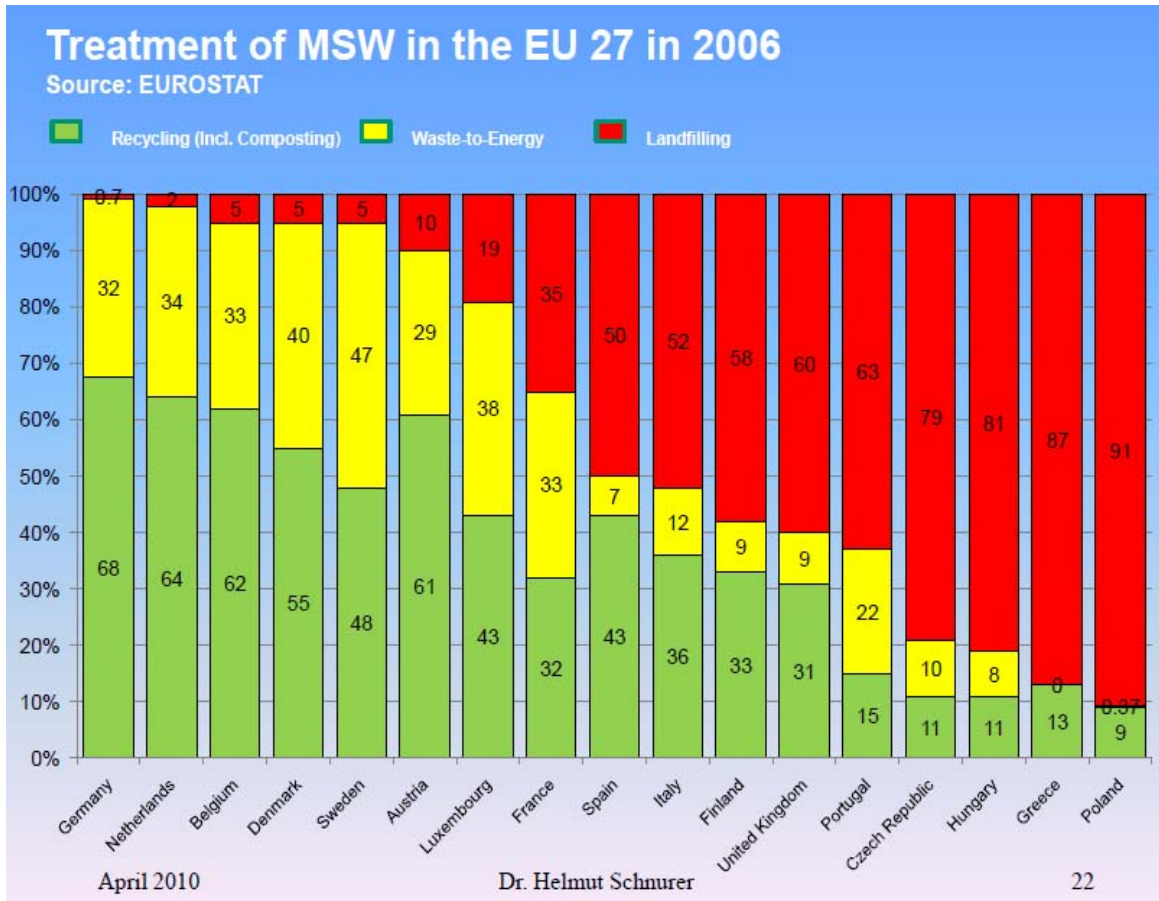
In Council Directive 1999/31/EC dated April 26, 1999, the European Union specifies WTE as one of the available strategies to reduce the landfilling of biodegradable waste and comply with Kyoto Protocol targets.⁵³ Figure 8 shows that WTE and recycling are key elements of the solid waste management strategies of European developed countries.

⁵¹ Source: Energy Recovery Council, <http://www.energyrecoverycouncil.org/waste-energy-reduces-greenhouse-gas-emissions-a2966>.

⁵² Source: Energy Recovery Council, <http://www.energyrecoverycouncil.org/waste-energy-reduces-greenhouse-gas-emissions-a2966>.

⁵³ Source: Energy Recovery Council, <http://www.energyrecoverycouncil.org/waste-energy-reduces-greenhouse-gas-emissions-a2966>.

Figure 8. Treatment of MSW in the EU



Source: Presentation by Dr. Helmut Schnurer, "Sustainable Waste Management Policy Development in Germany," presented at the International Symposium on Waste Management Information, Metropolitan King County Council, Seattle, Washington, April 20, 2010.

10.0 Concerns about the Environmental and Economic Impacts of Palm Beach County's Planned Facility

10.1 Greenhouse Gas Emissions

Concern:

Environmentally oriented citizens are concerned about the pollution impacts of this planned facility. These concerns are underscored by evidence that garbage incineration is not neutral with regard to greenhouse gas, particulate and other emissions. How much carbon will the plant release?

Response:

WTE is very close to greenhouse gas neutral, since much of the waste combusted is biogenic in nature (i.e., not from fossil fuel). As noted earlier, electricity generation in Florida is among the highest in the United States. Natural gas and coal are the leading fuels for Florida's electricity production, typically accounting for about 40% and 30% of net generation, respectively.⁵⁴ In fact, combusting 1,000 tons of solid waste saves the burning of about 1,600 barrels of oil or 500 tons of coal. And, while much of the oil Americans use is imported, solid waste is a continually generated alternative "domestic fuel." For this reason, WTE power, which displaces power generated by fossil fuel such as coal, oil, or natural gas, actually results in a significant net reduction of man-made greenhouse gas emissions.

The emissions from the new Authority facility will be regulated by the air permit issued by the Florida Department of Environmental Protection (FDEP), based on the federal regulations promulgated by the EPA. Emissions of carbon monoxide are regulated under this permit, and emission rates are monitored through a Continuous Emissions Monitoring (CEM) system required by FDEP, and reported to them regularly.

10.1.1 Greenhouse Gas Analysis Using EPA's Waste Reduction Model (WARM)

Key point: With the addition of the Authority's WTE plant and the County's current mix of programs, Palm Beach County would reduce GHG emissions compared with emissions from the current mix of waste programs.

The following analysis addresses the question about greenhouse gas emissions using EPA's WARM analysis.

Table 16 summarizes the processing programs, diversion rates, costs, whether the program is subsidized by the general fund, and impacts to landfill capacity for Palm Beach County, with and without the proposed WTE facility, and several jurisdictions mentioned by the Florida Sierra Club. San Francisco is mentioned because it has a high diversion rate. Austin; Washington, DC; and Philadelphia are mentioned because they worked with ILSR, and Montgomery County, MD, is mentioned because it is a community with a WTE facility.

⁵⁴ [www.eia.gov/state/state-energy-profiles-analysis.cfm?sid=FL\[4/7/2011](http://www.eia.gov/state/state-energy-profiles-analysis.cfm?sid=FL[4/7/2011).

Table 16. Summary of Jurisdictions' Programs

Jurisdiction	Processing Programs	Diversion Rate	Cost per Year for Single Family Residential	General Fund Subsidy (Y/N)	Impact on Landfill Capacity
Solid Waste Authority of Palm Beach County, FL	Recycling, composting, WTE, landfilling	40% ⁵⁵	\$361 ⁵⁶	N	Close in 2031
Solid Waste Authority of Palm Beach, FL	Current Programs with additional WTE	40% ⁵⁷	\$385 ⁵⁸	N	Close in 2048 ⁵⁹
City and County of San Francisco, CA	Recycling, composting, and landfilling	77% ⁶⁰	\$331 for 32 gallon \$255 for 20 gallon \$141 tip fee per ton at transfer station	N	No landfills within jurisdiction
City of Austin, TX	Recycling ⁶¹ , composting, landfilling	31% ⁶²	\$167 for 30 gallon \$230 for 60 gallon \$340 for 90 gallon	N	Six regional landfills, four in Austin area
Washington, DC	Recycling, composting, WTE, landfilling	24% ⁶³	Paid out of general fund	Y	No landfills within jurisdiction
City of Philadelphia, PA	Recycling, WTE, landfilling	18% ⁶⁴	Paid out of general fund	Y	No landfills within jurisdiction
Montgomery County, MD	Recycling, composting, WTE, landfilling	44% ⁶⁵	\$284 ⁶⁶	N	No landfills within jurisdiction

Table 17 summarizes the results from the U.S. Environmental Protection Agency's (EPA's) Waste Reduction Model (WARM). The model was used to estimate greenhouse gas (GHG) emissions from several different waste management practices, including recycling, composting, landfilling and combustion.

⁵⁵ 2009 unadjusted diversion rate from "Municipal Solid Waste Collection and Recycling Report for January 1, 2009 – December 31, 2009," dated April 5, 2011.

⁵⁶ Unsubsidized weighted average curbside collection rate unincorporated areas from email from Dan Pellowitz, SWA, April 4, 2011, and SWA fees based on "A Projection of Future Revenues, Costs, Rates and Debt Service Coverage Related to the Design, Construction and Operation of the Proposed Mass Burn WTE Facility, January 27, 2010."

⁵⁷ Assumes no change to 2009 diversion rate.

⁵⁸ Unsubsidized weighted average curbside collection rate in unincorporated areas, from Dan Pellowitz, SWA, April 4, 2011, and SWA fees based on "A Protection of Future Revenues, Costs, Rates, and Debt Service Coverage Related to the Design, Construction and Operation of the Proposed Mass Burn WTE Facility, January 27, 2010."

⁵⁹ Close in 2048 with incineration of existing WTE process residue.

⁶⁰ 2008 diversion rate using California's methodology, where total waste stream is based on 1990 values adjusted for population and economics rather than total waste stream for a given year. Actual tonnages handled by City's waste hauler result in a 46% diversion rate for FY2008, excluding private hauler tonnages.

⁶¹ City of Austin collects residential recyclables every other week, while other jurisdictions in the table collect every week.

⁶² FY 2009 diversion rate from City of Austin's "Integrated Solid Waste Management Master Plan," November 2010.

⁶³ FY 2009 residential diversion rate from Washington, D.C.'s "Annual Recycling Report for FY 2009."

⁶⁴ Email from Scott McGrath, AICP, Streets Department, City of Philadelphia, April 12, 2011.

⁶⁵ FY 2008 diversion rate from Montgomery County Division of Solid Waste Services Tracking Recycling Achievement COG Recycling Committee, January 15, 2009.

⁶⁶ Excludes leaf collection rate of \$89.

The default values in WARM for landfill gas recovery practices and transportation distances were used, unless noted. The GHG emissions are calculated in metric tons of carbon dioxide equivalent (MTCO₂E). It was assumed the proposed WTE plant would come on line in the year 2015. In order to compare GHG emissions, 2015 tonnages generated by Palm Beach County were analyzed using the percent mix of programs for the various jurisdictions. For example, Palm Beach County currently recycles 37%, composts 4%, combusts 38%, and landfills 21%.

Based on this percent mix of programs, Palm Beach County would reduce GHG emissions by 1.4 million MTCO₂E (column A), equivalent to a reduction of 3.7 million barrels of oil (column B). With the proposed WTE facility, recycling was assumed to stay at 37%, combustion (including yard waste that currently goes to compost and mulch) would increase to 52%, and landfilling would be 11%. This mix of programs would reduce GHG emissions by 1.6 million MTCO₂E (column A), equivalent to 4.3 million barrels of oil (column B), and would result in a decrease of 0.2 million MTCO₂E from the current mix (column C), equivalent to 0.6 million barrels of oil (column D).

Table 17. Environmental Impacts on the Solid Waste Authority of Palm Beach County's Waste Stream in 2015⁶⁷

Solid Waste Authority with:	(A) GHG Generated (million metric tons of carbon dioxide equivalent (MTCO₂E))⁶⁸	(B) Equivalent Million Barrels of Oil⁶⁹	(C) Change Compared to Current Palm Beach County Programs (MTCO₂E)	(D) Change Compared to Current Palm Beach County Programs (million Barrels of Oil)
Current Programs	(1.4)	(3.7)	N/A	N/A
Proposed Solid Waste Authority WTE Facility with Current Authority Recycling⁷⁰	(1.6)	(4.3)	(0.2)	(0.6)
Solid Waste Authority with Long Haul⁷¹	(1.4)	(3.7)	0.0	0.0
San Francisco Programs	(2.7)	(7.4)	(1.3)	(3.7)
San Francisco Programs with Hauler Tonnages	(0.7)	(2.0)	0.7	1.7
Austin Programs	0.2	0.5	1.6	4.2
Washington, DC Programs	(1.2)	(3.4)	0.2	0.3
Philadelphia Programs	(0.2)	(0.6)	1.2	3.2
Montgomery County Programs	(1.3)	(3.4)	0.1	0.3

As shown in Table 17, the Authority's proposed WTE facility generates a lower amount of GHG emissions than all of the scenarios except for San Francisco's program mix.

⁶⁷ Values in parenthesis (e.g., (1.4)) represent a reduction in emissions or barrels of oil. Values not in parenthesis represent an increase in emissions or barrels of oil.

⁶⁸ Assumes an average of 40 miles to transport yard waste for mulching and composting.

⁶⁹ Assumes 42 gallons per barrel.

⁷⁰ Assumes yard waste mulched and composted in current programs would go to the proposed WTE facility.

⁷¹ Assumes no new landfill in the County and material hauled to a landfill in southern Georgia.

Combustion or WTE facilities reduce greenhouse gas emissions in each of the following ways:

- by generating electrical power or steam, WTE avoids carbon dioxide (CO₂) emissions from fossil fuel-based electrical generation;
- the WTE combustion process eliminates the methane emissions that would have occurred if the waste was placed in a landfill; and
- the recovery of metals from municipal solid waste by WTE facilities is more energy efficient than the production of metals from raw materials.

As a result of these mechanisms, WTE produces electricity at a net emission rate of negative 3,636 lbs of CO₂/megawatt-hours (MWh). In other words, on a lifecycle basis, for every ton of trash burned at a WTE plant, approximately one ton of CO₂ equivalents is reduced⁷².

Using California's methodology to assess waste stream values, San Francisco has a program mix that includes 67% recycling, 7% composting, and 26% landfilling (for San Francisco, 3% used as alternative daily cover counts towards its 77% diversion rate). As noted earlier, San Francisco uses California's methodology where the total waste stream is based on 1990 values adjusted for population and economics rather than actual total waste stream tonnages for a given year.

Using actual recycling and composting tonnages handled by the City's hauler, San Francisco has a diversion rate of 46%. However, this rate does not include tonnages handled by the private sector. While San Francisco's 46% diversion rate is a higher diversion rate than the current diversion rate for the Authority, San Francisco's program mix results in higher GHG emissions (column A for San Francisco Programs with Hauler Tonnages) than current SWA conditions. As discussed in more detail earlier in this report, San Francisco implements the "Fantastic 3" program, providing each household with one cart for single-stream recycling, a second cart for food and yard waste, and a third cart for trash. San Francisco uses a Pay-As-You-Throw rate structure, where residents pay more if they dispose of more, providing an incentive to recycle. San Francisco is a single jurisdiction that has the authority to implement these programs and rate structure. In comparison, the Authority consists of 38 municipalities and the unincorporated area. Within the 38 municipalities, the Authority does not have the authorization to implement programs and rate structures.

The "Solid Waste Authority with Long Haul" scenario assumes no new landfill developed in Palm Beach County and thus materials need to be hauled 380 miles to a landfill in southern Georgia. This scenario would generate approximately the same amount of GHG emissions as the current scenario. The change compared to current Palm Beach County programs is negligible due to rounding (columns C and D for Solid Waste Authority with Long Haul). Austin considered a WTE facility but did not proceed. Its current mix of programs includes 23% recycling, 8% composting, and 69% landfilling. Applying this mix of programs to the Authority's 2015 tonnages would result in increasing the amount of GHG emissions by 1.6 million MTCO₂E (column C for Austin Programs) when compared to the current scenario for

⁷² Source: Energy Recovery Council, <http://www.energyrecoverycouncil.org/userfiles/file/ERC%202009%20climate-renewable%20paper.pdf>.

the Authority. Washington, DC, also considered constructing a WTE facility in 1986 and again in 1994 but chose to send materials to a WTE facility in Virginia. DC's program mix of 24% recycling and 76% combustion applied to the Authority's 2015 tonnages would result in increasing the amount of GHG emissions by 0.2 million MTCO₂E (column C for Washington, DC, Programs) when compared to the current scenario for the Authority. Philadelphia is another city that considered building a WTE facility but abandoned the idea when opposition arose. Currently, the City exports 55% of its waste for combustion. Philadelphia's mix of programs includes 18% recycling, 45% combustion, and 37% landfilling. These figures were used in the WARM analysis. This would result in increasing the amount of GHG emissions by 1.2 million MTCO₂E (column C for Philadelphia programs) when compared with the current scenario for the Authority. Lastly, Montgomery County has a WTE facility and includes a program mix of 30% recycling, 13% composting, 43% combustion, and 14% assumed to be going to landfilling. The 14% assumed to be landfilled in Montgomery County is handled by the private sector and not through the County's system. (Some of this 14% waste may well end up at the Covanta Fairfax WTE Facility, having been transferred through nearby transfer stations.) The Authority's 2015 tonnages with Montgomery County's program mix would result in an increase of 0.1 million MTCO₂E (column C for Montgomery County Programs) when compared to the current scenario for the Authority.

10.2 Need for Landfill Space for Ash and Other Non-combustible Waste

Concern:

Additional considerations must also be given to the need for landfill space. A mass-burn facility needs a landfill for ash and by-pass waste (waste that does not fit in the incinerator, and waste that is generated when the plant is down for routine maintenance). Landfilling may be required for as much as 20%-25% of the waste stream by volume.

Response:

First, ash that remains after combustion is 10% by volume, not 20-25%. Ash residue from WTE facilities is tested in accordance with strict state and federal leaching tests and is consistently shown to be safe for land disposal and reuse. Ash also exhibits concrete-like properties causing it to harden once it is placed and compacted in a landfill, reducing the potential for rainwater to leach contaminants from ash landfills into the ground.⁷³

Moreover, failing to construct the facility will consume much more landfill space. The proposed WTE facility will significantly reduce the County's reliance on landfilling. The WTE facility will ensure that, except during outages, no unprocessed combustible garbage will be landfilled for more than two decades. A WTE facility is first and foremost a volume-reduction machine. Incineration can reduce the volume of solid waste by 90%, greatly reducing the amount of material going to the landfill. If the Authority adopted ILSR's logic in the 1980s and did not build the existing WTE facility, the Authority's existing landfill would

⁷³ Source: Energy Recovery Council, <http://www.energyrecoverycouncil.org/ash-reuse-a2974>.

have been filled by 2005 and the Authority would have already been filling the next one. With the additional WTE capacity, this same landfill is projected to last until nearly 2050.

10.3 Water Use

Concern:

The mass-burn plant will probably need more than 1 million gallons of water per day to generate steam and then electricity. Where will this water come from? The County financial officers must make sure that the cost of this water over the next 20 years is anticipated in the facility budget. Of course, there are environmental and economic impacts of the use of this large amount of water, which affect homeowners, businesses and agriculture.

Response:

Very early in the design stage, the Authority recognized that water usage would be a critical design element. The new Authority WTE facility will incorporate innovative design and water reuse techniques to dramatically reduce the need for additional water. These measures include:

- Air-cooled condensers;
- Two million gallons of rainwater capture and storage capacity; and
- Reuse of cooling tower water from the existing WTE facility.

As a result of the reuse of cooling tower water, the facility will provide the additional benefit of significantly reducing the amount of water currently deep-well injected.

The water budget for the new facility, net of reuse and rainwater harvesting, is projected to be 145,000 gallons per day. The facility is being designed with extensive sustainability features, including rainwater harvesting and water reuse and recycling.

10.4 Lost Opportunity Costs

Concern:

A mass-burn facility that destroys raw materials presents West Palm Beach County with lost opportunity costs of expanding and creating small businesses, jobs and increasing the tax base. For every 10,000 tons of garbage that is burned in an incinerator, one job is created. For every 10,000 tons of raw materials recycled and composted 8-10 jobs are created as a result of value added to the materials. When the processed raw materials are used for manufacturing, hundreds of jobs are created for every 10,000 tons consumed. Compost products add to the local economy in other ways. The use of compost saves about 10% of water use and reduces, possibly eliminates the need for pesticides and fertilizers.

Response:

This concern ignores the fact that the Authority has an extensive and well established recycling program – one that already contributes to jobs and the local economy. The

Authority provides the opportunity for every resident and every business to recycle but has no control over whether or not people or businesses actually recycle. The Authority issues permits to private sector recycling facilities, which employ a significant number of people throughout the County. The Authority also provides residential curbside collection, more than 250 drop-off locations for recyclables throughout the County, and encourages and fosters commercial recycling. Any business may remove source-separated materials from their waste stream for recovery at any time to avoid the tipping fee, and as previously stated, source-separated recyclables are not subject to waste flow control.

The Authority has no control over how individuals and businesses calculate the opportunity cost for their actions. When a business decides to recycle, it has decided that the opportunity cost of doing so overrides the alternative. When markets are good for recovered materials, businesses spring up to recover these materials and the Authority does not see them. When markets contract and businesses cannot make money recycling, these materials then end up back in the waste stream and the Authority receives them.

10.5 Industry and Agricultural Companies Need Materials

Concern:

Big industry and agricultural companies are now vying for the materials that the County is now planning to incinerate. These include Strategic Materials, Waste Management, Inc., Alcoa, Reynolds, Hugo Neu, Coca Cola, Pepsi Cola and many others, which currently employ tens of thousands of workers in the U.S. These companies are introducing facilities throughout the U.S. and Puerto Rico in an effort to get control over raw materials.

Response:

The Authority's operations are not an impediment to companies competing for these materials if they choose to. In fact, the Authority has in the past and currently markets recovered recyclables and metals to several of these companies and others. These decisions will be market driven.

11.0 Sierra Club/ILSR Suggested Solutions⁷⁴

11.1 Postpone a Decision

ILSR Solution:

Postpone all decision-making on the 3,000 TPD mass-burn facility.

Response:

Delaying the project at this stage of the process could cost the Authority tens of millions of dollars in escalation and higher financing costs, with nothing to be

⁷⁴ Responses in Section 11 of this report were compiled with input from the Authority.

gained. From the beginning, the Authority has conducted an open, transparent process with many opportunities for public participation.

In 2005, the Authority began discussing the need for additional landfill space and/or WTE to ensure that there would be adequate disposal capability for the citizens of Palm Beach County. During that time it evaluated and discussed alternate and emerging technologies. For over five years the Authority has conducted meetings and workshops to discuss landfill, WTE, and other disposal option, many of which were attended by members of the Sierra Club.

The Authority was required by EPA pursuant to 40 CFR 60.57b of Subpart Eb, to prepare a Materials Separation Plan (MSP), which identified a goal and an approach to separate components of Municipal Solid Waste (MSW) in order to make those materials available for recycling. A public meeting was held on July 8, 2009, to discuss the Plan after which the Plan was placed in all Palm Beach County libraries for public review. A second Public Meeting of the final draft of the Materials Separation Plan was held on June 22, 2010, after which the Plan was placed in all Palm Beach County libraries for public review.

EPA developed this process for new WTE projects so that the public would have an opportunity to provide comments and input. This Plan outlines in detail the Authority's recycling and diversion program. Clearly, this would have been the perfect opportunity for the Florida Sierra Club to provide input.

This process has been open and transparent from the beginning and the Authority has made every effort to encourage public participation. This project has been discussed at over 30 regular Authority Governing Board meetings and/or workshops spanning a five-year period. For the past three years, Authority staff has pursued a public outreach program to inform and educate, and to receive comments and input from the public on the WTE project. Staff has met with and made presentations to Home Owner Associations, community groups and elected officials, and has been on the agendas for the cities of West Palm Beach, Palm Beach Gardens, and Riviera Beach.

As part of the Florida DEP permitting process, the Authority was required to mail a first-class postage notice about the project to every residence (over 65,000 were sent) within a three-mile radius of the proposed facility. From this mailer, approximately 12 inquiries were received.

Staff has always been upfront and candid with projections of cost for the project. Conservative but realistic estimates for construction and operating costs were developed and used during the planning phase to determine the impact of the project on the rate payer. The Authority now has firm bids to calculate how the project will impact rates and the analysis reveals that rates will be lower than earlier estimates.

This proposed facility will ensure that, with the exception of outage periods, Palm Beach County will landfill no combustible waste for decades. There are no other proven reliable alternatives available today that can achieve this result.

11.2 Alternatives Study

ILSR Solution:

Conduct an alternatives study; estimated cost \$30,000-\$40,000.

Response:

In August of 2009, the Authority issued a Request for Information and Capabilities (RFIC) to solicit information on municipal solid waste disposal technologies that might provide an alternative to the mass-burn technology being considered. One response was received and evaluated by the Authority's consulting engineer, Malcolm Pirnie. Malcolm Pirnie determined that the technology – high temperature gasification – had never been used in a large scale operation to handle municipal solid waste.

11.3 Mandatory Recycling

ILSR Solution:

Question:

Implement mandatory recycling as practiced throughout the United States. How much would we save our citizens in tip fees if recycling were mandatory for businesses?

Response:

There is no evidence to support the theory that mandatory recycling for businesses reduces cost. The Authority has researched communities that have mandatory recycling for businesses and learned that mandatory recycling did not increase recycling rates by any significant amount. Further, most programs grant exemptions for small businesses because of the added financial burden or the lack of space. Finally, the mandatory recycling ordinances are rarely enforced. The Authority offers commercial recycling to every business in the unincorporated area, has a substantial commercial outreach program to encourage recycling, provides a revenue share to businesses that recycle cardboard, and subsidizes the container rental for businesses that recycle. Additionally, many businesses such as Publix, Wal-Mart, Home Depot, and large furniture warehouses already recycle through their own outlets.

11.4 Pay-as-You Throw (PAYT)

ILSR Solution:

Implement PAYT garbage fees that encourage source reduction, composting and recycling. Seven thousand U.S. jurisdictions use PAYT at this time.

Response:

The Authority does have a PAYT system for commercial accounts throughout the County, which represents 40% of the waste generated in the County. Through their hauler, all commercial accounts pay disposal fees based on collection volume. These disposal fees can

be reduced by recycling. As previously stated, the Authority actively promotes commercial recycling.

In addition, the Authority has studied PAYT for residential waste disposal. An Authority task force, made up of the Authority staff, municipal representatives and the environmental community, including the Sierra Club, determined for a multitude of reasons that such a County-wide system would not be feasible for residential customers in Palm Beach County. Because the County comprises 38 municipalities, all of which administer collection in their jurisdictions, all 38 municipalities would have to agree to adopt a similar PAYT system for this to work.

11.5 Incentivizing Participation in Curbside Recycling

ILSR Solution:

RecycleBank, Inc. offers a private sector approach to providing cash incentives to households to participate in recycling.

Response:

None of the Authority's programs inhibits private sector incentives like RecycleBank from operating within Palm Beach County, neither does the Authority subsidize private sector recycling businesses. The Authority has a program of sharing commercial revenues with businesses and residential revenues with municipalities. The Authority intends to explore ways of doing so with residential customers.

11.6 Voluntary Backyard Composting

ILSR Solution:

Implement voluntary backyard composting, which removes about 15% of household waste from the waste stream.

Response:

Residents are free to compost now and the Authority promotes backyard composting. In fact, the Authority used to provide compost bins at a discount but stopped the practice to avoid unfairly competing with private businesses that sell them.

11.7 Zero Waste Zone for Restaurants

ILSR Solution:

Establish a Zero Waste Zone for restaurants, as developed in Atlanta, GA, in combination with food recovery programs at the city jail and airport.

Response:

If businesses within any municipality or area of the unincorporated County began a Zero Waste Zone initiative, the Authority would encourage and support this type of private

sector, market-based waste reduction and recycling program. In addition, the Authority has recently authorized a pilot program with Wal-Mart for food waste recycling. The Authority's successful recycling programs have always been voluntary, and the Authority does not support mandatory recycling for all of the reasons previously stated. It is important to note that Atlanta is one jurisdiction and Palm Beach County has 38 municipalities and an unincorporated area.

Finally, it is important to note that the Authority's primary role is to protect the public health, safety and welfare. It is not to preempt, or subsidize, private sector initiatives or companies seeking to recycle or reduce waste generation. The Authority is not authorized to refuse to provide service.

11.8 Resource Recovery Park

ILSR Solution:

Resource Recovery Park for recycling and composting companies as is being implemented in Collier County and Alachua County, FL. Atlanta is now in discussions with small-scale glass, paper and plastic manufacturers.

Response:

Businesses are free to start up where they please now. The Authority neither discourages nor uses public funds to subsidize private-sector initiatives. Experience has shown, however, that it is extremely difficult to site solid waste management facilities due to public concern about the traffic, noise and odor. In 1995, the Authority could not site a MRF in an industrial area in Delray Beach, FL, near a concrete plant and the railroad, due to opposition from the residents and the city.

11.9 Procurement for Source Reduction

ILSR Solution:

Procurement for source reduction for government, industry and household purchasing.

Response:

The Authority and many municipal governments already do so.

11.10 Extended Producer Responsibility

ILSR Solution:

Extended Producer Responsibility (EPR) Programs and Safe Centers which require manufacturers to take back hazardous products after their use. Households and small businesses can drop off these materials (batteries, chemicals, sharps, paint) for industry to pick up and dispose of safely, without taxing local budgets for hazardous waste management.

Response:

The Authority's Household Hazardous Waste Program accepts an extensive list of household products, including batteries, chemicals, paint and electronics, for recycling and proper disposal at no charge to residents. The programs advocated by ILSR and the Florida Sierra Club would require a state and/or federal initiative and are beyond the authority of the Solid Waste Authority.

11.11 Anaerobic Digestion

ILSR Solution:

Anaerobic Digestion systems, which process organic materials (manures, biosolids, food discards, yard debris) into methane gas for energy recovery. These facilities can digest biosolids and food discards together or just food discards.

Response:

Key point: These are expensive processes which leave a by-product which has no value and most likely will end up in a landfill, and as noted, generate methane gas that is in turn burned to produce power. The superiority of this process to WTE is arguable. While more municipalities are beginning to look into the option of utilizing anaerobic digestion (AD) to process MSW, most of the projects are in the feasibility, pilot project, or development stage and for tonnages much smaller than the Authority needs.

A detailed discussion of what is AD and what is currently being done follows.

What is anaerobic digestion?

Anaerobic digestion (AD) of MSW is the biological decomposition of organic matter with little or no oxygen. The by-products of AD include a compost-like soil conditioner, water and residue consisting mostly of stones, glass or similar items. Ash is not a by-product. AD also generates a salable off-gas and requires pre-processing of MSW, which can generate ferrous and other materials for sale.⁷⁵ Currently AD is primarily used to process sewage sludge, manure and other homogeneous wastes.

Benefits of AD include a reduction in the mass of organic waste in landfills, reduced fugitive methane emissions from landfills, generation of liquid and/or solid soil amendments, and generation of renewable energy from biogas.⁷⁶

As applied to the processing of municipal solid waste (MSW), anaerobic digestion is a wet treatment process where waste is first pre-sorted and then fed into water tanks. Using agitators, pumps, conveyors and other materials handling equipment, MSW is wetted and

⁷⁵ "Meeting the Future: Evaluation the Potential of Waste Processing Technologies to Contribute to the Solid Waste Authority's System," prepared by Gershman, Brickner & Bratton, Inc., for Palm Beach Solid Waste Authority, September 2, 2009.

⁷⁶ ESA prepared for Calrecycle, "Statewide Anaerobic Digester Facilities for the Treatment of Municipal Organic Solid Waste, Draft Program Environmental Impact Report," February 2011.

formed into a slurry. Metals, glass and other constituents of MSW that have no affinity for water are eventually discharged from the system into dedicated containers for recycling, further processing or final disposal. The paper, garbage, soluble components, etc., generate "black water," which has a relatively high organic content. This stream is processed in a series of sealed digesters without air where microorganisms break down the solids and generate gas containing methane and other organics.

This gas can be burned as a fuel for heating or for electric power generation. The solid residual from the digestion process is similar to compost and can be used as a soil amendment. The process also separates out recyclable materials such as glass and metals. There are many such facilities processing sewage sludge, manure and other homogeneous wastes.

Current projects with anaerobic digestion

ArrowBio of Haifa, Israel, is a vendor offering to construct anaerobic digestion facilities to process MSW in the United States. ArrowBio operates a 100 TPD full-scale MSW demonstration process line in Tel Aviv and has a 270 TPD commercial scale plant for MSW operating in Sydney, Australia. The company has responded to procurements in Los Angeles and New York. As described below, ArrowBio is currently constructing an AD facility in Perris, CA.

California

California's Department of Resources Recycling and Recovery (CalRecycle) is encouraging the development of technologies that divert organic waste from landfills and comply with the Global Warming Solutions Act of 2006 (AB 32). AB 32 calls for the reduction of greenhouse gases and the use of low carbon fuels, and solid waste landfills are a significant source of greenhouse gases due to decomposition of organic material in landfills into methane. Anaerobic digestion is being considered for many projects to divert organic materials from landfills and produce low carbon fuels.⁷⁷

Los Angeles County is currently engaged in three pilot projects to demonstrate the technical, economic and environmental viability of conversion technology facilities, and to establish pathways for permitting and financing commercial scale projects. In January 2011, one of the three County-endorsed demonstration projects with CR&R/Arrow Bio received a \$4.5 million grant from the California Energy Commission. Construction now is underway for an AD facility sited at CR&R's existing materials recovery facility in Perris, CA. The project will process 150 TPD of post-recycled residual solid waste and convert the biogas generated in biomethane for the County's truck fleet. The other two projects approved for demonstration are for International Environmental Solution and Burrtec, a 184 TPD pyrolysis facility in Riverside County, and for Entech Renewable Energy Solutions and Rainbow Disposal, a 360 TPD gasification system in Huntington Beach. Interstate Waste Technologies, Inc. (Malvern PA) is a fourth company that was qualified for a pilot project by

⁷⁷ Calrecycle, <http://www.calrecycle.ca.gov/SWFacilities/Compostables/AnaerobicDig/default.htm>.

the County. However, since IWT does not yet have a project site, further implementation of an IWT project is on hold.⁷⁸

In Oakland, CA, the East Bay Municipal Utility District's (EBMUD) anaerobic digester converts post-consumer food waste from local restaurants and markets to energy via anaerobic digestion. EBMUD captures methane generated in the digester, and uses it as a renewable source of energy to power the treatment plant. After the digestion process, the leftover material can be composted and used as a natural fertilizer. The EBMUD study found that the methane production potential of biosolids was 120 cubic meter (m³) gas/ton compared with food waste at around 367 m³ gas/ton. Additionally, anaerobically digesting 100 tons of food waste per day, five days a week, provides sufficient power for approximately 1,000 homes.

In October 2006, Onsite Power Systems Inc., in association with the University of California - Davis, launched a biogas energy project with the start-up of an anaerobic digester. This AD facility initially processed residential and restaurant waste from San Francisco, gradually increasing the amount to 8 TPD. Each ton of food waste is expected to generate enough bioenergy to power and heat 10 homes over a 24-hour period.⁷⁹

New York

In 2004, the City of New York commissioned a report to evaluate new and emerging waste management and recycling technologies and approaches. The objective of the evaluation was to provide information to assist the City in its ongoing planning efforts for its waste management system. As part of the process, the City collected information on capital cost from the suppliers. Based on six responses, the capital cost per installed ton for AD ranged from \$74,000 to \$82,000.⁸⁰

The New York City Economic Development Corporation hired R.W. Beck to investigate the feasibility of developing an anaerobic digestion facility in the Hunts Point Food Distribution Center (HPFDC) area of the Hunts Point peninsula of New York. The study indicated that it could be physically and economically feasible to process 60,000 tons per year of organic rich-waste from HPFDC and the nearby area.⁸¹

Toronto

Two full-scale AD facilities in and near Toronto process MSW. The City of Toronto's Dufferin Organics Processing Facility has a capacity of 25,000 metric tons per year using wet digestion technology. Toronto's Green Bin program provides curbside household organics collection to 500,000 households and 20,000 businesses. The combined businesses and

⁷⁸ CR&R Arrow Bio.

⁷⁹ State of Washington, Department of Ecology, <http://www.ecy.wa.gov/programs/swfa/ad/us.html>.

⁸⁰ "Meeting the Future: Evaluation the Potential of Waste Processing Technologies to Contribute to the Solid Waste Authority's System," prepared by Gershman, Brickner & Bratton, Inc., for Palm Beach Solid Waste Authority, September 2, 2009.

⁸¹ R.W. Beck prepared for the New York City, Hunts Point Anaerobic Digestion Feasibility Study, July 2010, <http://www.nycedc.com/ProjectsOpportunities/CurrentProjects/Bronx/HuntsPointVisionPlan/Document s/HuntsPointAnaerobicDigestionFeasibilityStudy.pdf>.

households provide a large source-separated organics stream to the facility. The second facility, located outside of Toronto, has a design capacity of 400 metric TPD.⁸²

11.12 Food waste could be composted if vegetative, or bio-digested if animal-based waste

Concern:

We believe that the County could save significant money by pushing a more aggressive recycling program rather than expanding this plant. In particular, heavy food waste could be either composted if vegetative waste or bio-digested if animal based.

Response:

First, it is important to consider the percentage of food waste in Palm Beach County's waste stream. A 2002 waste characterization study for Broward County, FL, found that food waste comprised 4% of the overall MSW stream, consisting of between 4% and 6% of single family residential MSW and 8% of multi-family/commercial MSW.⁸³ It is likely that Palm Beach County, FL's percentages of food waste are similar, although no recent waste characterization in Palm Beach County has been performed. Second, this statement relies on the premise that food waste composting or bio-digestion is less expensive than WTE. In the Authority's experience this is not necessarily true. For nearly 20 years, the Authority has operated one of the largest in-vessel composting operations in the country. This facility composts over 100,000 tons of yard waste and waste-water-treatment plant sludge and produces over 60,000 tons of compost per year. The cost per ton of throughput is more than double the cost of WTE and nearly four times the cost of landfilling. Unfortunately, due to the lack of viable markets for the product, most of the material never leaves the Authority's site. Further, the composting operations produce significant odors. It is not likely that the Authority could successfully site a food waste composting operation east of the Everglades Agricultural Area. This is illustrated by the fact that there are numerous examples of facilities, including two in South Florida, that were built in urban areas that were closed because of odors.

With regard to food waste, the Authority has recently approved a three-year pilot study for Wal-Mart. This is in addition to an earlier project approved where, using Black Soldier Flies, the Authority is assisting a group to produce an organic food for farm-raised fish from food waste. The Authority believes that food waste separation and recycling is viable for some large commercial producers. However, separate residential food waste collection is not viable for several reasons including, but not limited to, the following: high collection costs, the burden on the customer, high contamination rates, the potential to attract vermin, the potential inability to site a facility to manage this material, and the inability to produce a marketable product.

⁸² ESA prepared for Calrecycle, "Statewide Anaerobic Digester Facilities for the Treatment of Municipal Organic Solid Waste, Draft Program Environmental Impact Report," February 2011.

⁸³ Malcolm Pirnie, Inc., "Broward County Resource Recovery Board District-Wide Solid Waste Composition Study," circa 2002 (no date provided), and "Broward County Final Additional Waste Composition Study Technical Memorandum," February 23, 2005.

11.12.1 Overview of National Organics Collection and Processing

According to the EPA, in 2009, food waste represented over 14% of the total municipal solid waste stream, amounting to over 34 million tons of food waste produced that year, second only to paper in material-specific waste generation. However, unlike highly-recycled paper, less than 3% of the food waste generated in 2009 was recovered and recycled. The other 33 million tons were discarded in landfills or WTE plants, making food waste the single largest component of MSW reaching disposal sites.⁸⁴ Food waste generation estimates vary between about 200 and almost 500 pounds per person per year.⁸⁵ Due to its prevalence and weight, removing food waste from the waste stream can significantly reduce the total quantity of waste materials sent for disposal.

A 2002 waste characterization study for Broward County, FL, found that food waste comprised 4% of the overall MSW stream, consisting of between 4% and 6% of single family residential MSW and 8% of multi-family/commercial MSW.⁸⁶ Palm Beach County, FL's fraction is estimated to be similar, but no recent waste characterization has been performed. Most food wastes are generally fairly wet, containing around 70% moisture.⁸⁷ Moisture content of any wastes can also vary based on climate and recent rainfall of a region. As feedstock for WTE plants, wetter wastes, such as food discards, produce less efficient ignition, requiring additional pollution control measures, since good combustion minimizes the formation of pollutants such as carbon monoxide and other products of incomplete combustion.⁸⁸ When discarded in landfills, organics such as food waste contribute to added methane production. In fact, one Portland, OR, study found that "one wet ton of food discards produces 16.2% more methane per wet ton than the average wet ton of mixed solid waste."⁸⁹

After excluding yard waste and recyclable paper, which can be managed under traditional programs, the additional organic material available for diversion typically includes food scraps and soiled paper, generally referred to as source-separated organics. In addition to practicing waste reduction and providing edible food for donation, capturing this organic resource and transforming it into usable material can be accomplished through various methods utilizing on-site composting, collection for off-site composting, and removal with wastewater. As a decentralized management method, food wastes ground up and removed via sink-based "garbage disposal" units in homes and businesses end up being processed

⁸⁴ U.S. EPA, "Basic Information about Food Waste," <http://www.epa.gov/wastes/conserves/materials/organics/food/fd-basic.htm>, last updated March 24, 2011, (accessed April 5, 2011).

⁸⁵ Chaz Miller, National Solid Waste Management Association, Insinkerator Food Waste Symposium presentation, Chicago, August 30-31, 2010.

⁸⁶ Malcolm Pirnie, Inc., "Broward County Resource Recovery Board District-Wide Solid Waste Composition Study," circa 2002 (no date provided), and "Broward County Final Additional Waste Composition Study Technical Memorandum," February 23, 2005.

⁸⁷ "Integrated Solid Waste Management, Engineering Principles and Management Issues," Tchobanoglous/Theisen/Vigil, 1993.

⁸⁸ Energy Recovery Council, "Educate Yourself: How Does WTE Turn Garbage into Green Power?," <http://www.energyrecoverycouncil.org/educate-yourself-wte-turn-garbage-green-a2977>, (Accessed April 6, 2011).

⁸⁹ "Food Waste Diversion Greenhouse Gas Analysis: Portland, Oregon," January 2004. <http://www.portlandonline.com/bps/index.cfm?a=111051&c=41789> (Accessed April 6, 2011).

with biosolids in the local wastewater treatment plant; Palm Beach County's biosolids are pelletized and utilized for soil amendment, returning the organics to the Earth.

Recognizing the usable waste fraction represented by food discards, some jurisdictions have implemented multifaceted food composting programs, encompassing food wastes generated at and collected from households, businesses, campuses, and large facilities. This appears to be a growing trend. Addressing this trend and using a grant from EPA Region, in 2009 the U.S. Composting Council published *Best Management Practices for Incorporating Food Residuals into Existing Yard Waste Composting Operations*, as a manual to assist compost facilities in expanding their operations to manage food residuals. In addition, the Solid Waste Association of North America (SWANA) Applied Research Foundation published a research memorandum in 2008, *Curbside Collection of Residential Food Waste*, to provide recycling managers with information on the curbside collection of food waste, as they strive to achieve higher waste diversion goals locally.

On-site management methods can vary in size from households participating in small backyard composting or vermicomposting with worm bins to medium-sized in-vessel composting systems, such as the Earth Tub used on the University of North Carolina at Charlotte campus or the BW Organics Model 512 unit at Clemson University, and to large commercial-scale, in-vessel composting systems, installed at correctional facilities such as Powhatan Correctional Facility, VA, and Riverview Correctional Facility, NY⁹⁰. Manufacturers of backyard compost bins recognize the value of residential market and support municipal backyard composting education and promotion efforts by partnering to plan, coordinate, and execute "truckload" or community sales of their products.⁹¹

Off-site commercial composting operations and facilities handling food wastes are owned and/or operated by both public and private entities. Large-scale private composting companies are available around the country to handle food wastes along with other organics, including firms such as: McGill (VA, NC), Cedar Grove Composting (WA), Brooks Contractor (NC), Recycled Green Industries (MD/DC/VA), Peninsula Compost Group (DE, MD, NJ, PA), and more. Public jurisdictions in the United States operating their own compost sites that accept food wastes include cities and counties such as Plano and McAllen (TX), Keene (NH), St. Peters (MO), Rapid City (SD), Iowa City and Linn County (IA), Ann Arbor (MI), Modesto (CA), and Gustavus (AK)⁹²; several municipal facilities also operate in Canada

Large food-based manufacturers and retailers are also creating programs to divert food wastes for composting. Corporations such as Whole Foods Market, Wal-Mart, and Frito Lay, with multiple locations in various states, are leading the way in implementing commercial food waste diversion for composting. This, in turn, is driving local waste haulers to offer food organics collection and area composting sites that accept food wastes. EnviRelation, a food waste hauling company in the DC Metro region, formed five years ago and has since

⁹⁰ Wright Environmental Management Inc., "In-Vessel Composting Systems for MSW, Food Waste, Biosolids, & Animal Wastes," <http://www.wrightenvironmental.com>, (Accessed April 6, 2011).

⁹¹ Norseman Environmental Products, "News and Events," http://www.norsemanplastics.com/html/norseman_environmental_news_events.html, (Accessed April 5, 2011).

⁹² BioCycle, "BioCycle's Find A Composter.com," www.findacomposter.com, (Accessed April 6, 2011).

collected 9,000 tons of food.⁹³ Urban Service Systems Corporation also began hauling food organics from the DC area, along with their usual waste and recycling hauling services. The market for both of these haulers is Maryland composter Recycled Green Industries, traditionally a yard waste composter, which added food discards to its acceptance list. National waste hauling leader Waste Management, Inc. is also publicly discussing providing food discards hauling to their customers in the DC area, proving there is plenty of interest in the region. When not partnered with a local hauler for collection service, spoiled produce and other biodegradable waste from Whole Foods' stores are backhauled on their delivery trucks to regional composting facilities.⁹⁴

SWANA reports that a total of 56 municipalities had curbside residential food waste collection service in the United States in 2008, including programs in Washington (32), California (16), Minnesota (7), Iowa (1), and Michigan (1).⁹⁵ Regulations can facilitate diversion of food wastes, such as the City of Seattle's mandatory food waste collection from single family residences, coupled with yard waste organics removal, and only allowing residents to opt out if they compost at home.⁹⁶ The San Francisco, CA, program, operating since 2000, serves the City's 150,000 residents weekly, using a three-cart system for waste, recyclables, and organics.⁹⁷ In 2009, this previously voluntary program became mandatory and is now being applied to apartments as well, with program satisfaction remaining high.⁹⁸ In advance of a requirement, the simple convenience of allowing food waste to be included in the same collection container with typical yard waste organics can also assist in attracting this material for composting. In King County, WA, this combined service is now available to over 90% of single family households.⁹⁹ Beginning in 2002, weekly curbside residential food waste collection services have been offered to 13 municipalities in Alameda County, CA, serving a total of 298,600 residences.¹⁰⁰

In New Jersey, the City of Gloucester has been chosen as the site for the first organic waste to energy/compost recycling plant to be constructed in the United States. The \$30 million, 110,000 square foot facility will be located in the City's Southport Development area on 9.5 acres at the end of Water Street and the Delaware River.

The organics recycling facility will accept 60,000 tons annually of organic material (source-separated food waste, yard waste, and brush) for processing into renewable energy and

⁹³ Walker Lunn, EnviRelation, LLC, letter to customers, dated February 21, 2011.

⁹⁴ Whole Foods Market, "Green Mission," <http://www.wholefoodsmarket.com/values/green-mission.php> (Accessed April 6, 2011).

⁹⁵ Solid Waste Association of North America Applied Research Foundation, "Curbside Collection of Residential Food Waste," December 2008.

⁹⁶ Seattle Public Utilities, "Food and Yard Waste at Your House," http://www.ci.seattle.wa.us/util/Services/Yard/Yard_Waste_Collection/index.asp (Accessed April 5, 2011).

⁹⁷ Solid Waste Association of North America Applied Research Foundation, "Curbside Collection of Residential Food Waste," December 2008.

⁹⁸ Center for a Competitive Waste Industry, "Beyond Recycling: Composting Food Scraps and Soiled Paper," Report to EPA Region 9, <http://www.beyondrecycling.org/general/full-ccwi-report>, January 2010, (Accessed April 5, 2011).

⁹⁹ King County Solid Waste Division, "Curbside Food Scrap Collection," <http://your.kingcounty.gov/solidwaste/garbage-recycling/food-collection.asp>, last updated March 31, 2011, (Accessed April 5, 2011).

¹⁰⁰ Ibid.

compost. The facility will generate approximately two megawatts of renewable energy and 60,000 cubic yards of high-quality compost and will operate during normal business hours five and a half days a week between the hours of 6 a.m. and 4 p.m. The plant would receive approximately 25 trucks a day, process at most 200 TPD or 60,000 tons a year. It would employ 20 people, including laborers, truck drivers and office staff. Once all permits are obtained, construction would take about nine months with expected completion in two years. The expected revenue share from electricity and compost to the City would be in the \$200,000 per year range to start, increasing to \$400,000 in years 26-30.

The process involves a negative air pressure building. The building itself is effectively sealed allowing for no odor. Each building section will have a ventilation system with multiple air exchanges, which recycles and filters the air internally before being exhausted out of the building through a biofilter. This is based upon technology presently in use in Germany.

The best raw product for the process is food so large food producers will likely be customers, including hospitals, schools, restaurants, grocery stores and fruit importers. In addition it would take yard waste, grass clippings, brush, etc.¹⁰¹

The diversion numbers highlight successes in food waste collection. Seattle Mariners baseball stadium, Safeco Field, had a 38% recycling rate in 2009 before it began to collect food waste and compostable items. After adding collection of food waste organics and compostable serviceware from the facility, the recycling rate during the first two months of the 2010 season jumped to 82%, an increase of over 100%.¹⁰² In 1996, the Del Mar Fairgrounds in Del Mar, CA, recovered an estimated 75% of its 51 tons of food discards, for a net savings of \$17-23 per ton over hauling to landfill for disposal.¹⁰³ Over half of the correctional facilities in New York State participated in composting food and other organic discards, recovering 90% and achieving a net savings of \$564,200 in 1997.¹⁰⁴ Since 2000, the University of North Carolina at Charlotte has saved \$8,059 by composting a total of 146,049 pounds of food.¹⁰⁵

If food wastes are not collected from residences in Palm Beach County, such as combined with yard waste hauling, then this usable organic material will either be discarded with wastewater through in-sink disposals or be placed in the municipal garbage can for collection. On-site organics separation at large commercial locations, however, can be expected to grow for sites where it is relatively easy and economical to separate food wastes for collection or on-site management. Locations like convention centers, hotels, supermarkets, schools, correctional facilities, religious institutions, and restaurants are finding ways to reduce their waste hauling costs through food waste segregation. These

¹⁰¹ Gloucester, New Jersey, <http://www.gloucestercitynews.net/clearysnotebook/2010/12/the-city-of-gloucester-city-has-been-chosen-as-the-site-for-the-first-organic-waste-to-energycompost-recycling-plant-to-be-c.html?cid=6a00d8341bf7d953ef0148c87e86f8970c>.

¹⁰² BioCycle, "Diversion Grand Slam: Take Me Out to the Windrow," December 2010.

¹⁰³ U.S. EPA, "Del Mar Fairgrounds, Del Mar, California 75% Recovery of Food Discards," Publication #EPA-530-F-98-023a, September 1998.

¹⁰⁴ U.S. EPA, "New York State Department of Correctional Services (DOCS)," New York 90% Recovery of Food Discards, Publication #EPA-530-F-98-023g, September 1998

¹⁰⁵ University of North Carolina at Charlotte Office of Waste Reduction & Recycling, "Composting Food Waste at UNCC," <http://facilities.uncc.edu/recycling/Documents/UNCC%20composting%202006.pdf>, (Accessed April 6, 2011).

businesses have become targets for private service providers interested in expanding organic material supply for existing or new composting operations. As these larger commercial food waste management systems are implemented, Palm Beach County is likely to see a decrease in the portion of food discards in the waste stream originating from commercial sources, diverting up to 20-30% of the estimated 8% of the multi-family/commercial MSW which is food waste.

11.13 E-Waste

Concern:

Another serious issue is e-waste. When burned, these items could create a toxic result that would have to be discarded in our landfill. We believe that further study is required to answer this question before moving forward.

Response:

The Authority accepts e-waste free of charge at drop-off centers located at all of its transfer stations and at its main facility at 6161 North Jog Road, West Palm Beach. Based on evidence from the Authority's analysis of landfill leachate and air emissions, there is no evidence that e-waste disposal has created any environmental risks at the Authority's facilities. The new WTE facility is being designed with the most advanced air pollution control systems and lowest emissions of any facility of its kind. E-waste not recycled can be safely combusted or landfilled.

11.14 Excess Facility Capacity

Concern:

Moving forward with this plant will mean that the County will have significant excess incineration capacity.

Response:

As with all of the Authority's infrastructure, including the Recovered Materials Processing Facility and the transfer stations, the proposed WTE facility is sized to accommodate future growth. The goal is to build for the future and not have a facility that is at capacity on the day it is commissioned. The existing WTE facility was in operation for almost 10 years before it reached its maximum throughput. This "excess capacity" extended the life of the Authority's existing landfill by many years. By sizing the new facility to accommodate future growth, the Authority will ensure that Palm Beach County will landfill no combustible garbage for more than two decades, will defer the need for a replacement landfill for approximately 40 years, and will provide a landfill diversion rate well in excess of 70%.

11.15 Waste Flow Control

Concern:

Excess plant capacity could mean a waste flow control ordinance, which would require all garbage being sent to the incinerators. This would artificially limit the options for businesses to divert their materials through less expensive means. For example, in most small businesses corrugated cardboard is the largest portion of the material generated. This material is a commercial commodity and can be picked up and recycled at a much lower cost than processing at an incineration facility. Horse farmers could face the same problem. Horse manure can be composted to produce topsoil, and/or digested for energy recovery (methane). There are hundreds of on-farm manure digestion systems in operation. Generators could be discouraged from applying these environmentally friendly and less expensive management alternatives.

Response:

First, the Authority has always had waste flow control, and waste flow control for publicly-owned systems was supported in the 2007 Oneida-Herkimer U.S. Supreme Court decision. Waste flow control has been in the Authority's Special Act since it was passed by the Legislature in 1975. In the absence of flow control for solid waste, history suggests that the waste flows to the lowest cost, least environmentally sound disposal alternative, which is generally a regional landfill. Second, waste flow control does not apply to source-separated recyclables, like cardboard and other commodities. The State of Florida has specifically excluded these recovered materials for regulation or jurisdiction as a solid waste. The Authority cannot require any business (or individuals) to deliver recovered materials to an Authority facility if they choose to do otherwise.

The Authority has always encouraged businesses to recycle. This is accomplished through its public education and commercial outreach programs; the split assessment, which is a PAYT program; maintaining high tipping fees to provide the economic incentives to recycle; subsidizing recycling container rental; and the commercial revenue share program. With regard to horse manure, this material is considered agricultural waste and is regulated by the Department of Agriculture. The Authority has no authority to regulate horse manure or other agricultural waste.

11.16 Payment for Electricity Generated by the Plants

Concern:

The more electricity generated by the plants, the more citizens will pay for the system. There are two forms of citizen payouts.

- 1. The cost of the incinerator will be seen through the tip fee for bringing County garbage to the plant. This fee will have to pay off the cost of the plant and retire the bond debt. At an estimated cost of \$500 million (conservative figure) the payout over 20 years for the County (households and businesses) will be \$1 billion.*

2. *The electricity will be sold to the local utility. Public Service Commission customers will have to pay premium rates for 'renewable energy'. The local utility will have to invest about \$40 million for a turbine for the plant. This will be added to the rate base. Thus, customers will be paying for the tip fee, the premium electricity cost and the \$40 million.*

Response:

These statements are in incorrect. In fact, the opposite is true. First, the more electricity produced, the more revenue will be generated, which is used to offset rates to the Authority's ratepayers. Second, Florida statute limits the utility to paying less than "avoided cost" for the power generated from the facility and the investment by the local utility in the Authority's power-generating equipment is limited to what the utility would pay to install such equipment in a facility that they themselves would build. As a result, the utility's ratepayers will not pay more for electric. They will in fact pay less. They will also benefit from clean, renewable energy, a more diversified fuel supply, decreased fossil fuel consumption and decreased reliance on foreign imports.

11.17 Plastic Items and Styrofoam

Question:

What happens to plastic items and Styrofoam that do not get recycled?

Response:

Plastic items and Styrofoam, plastic-coated paper, and similar materials for which no viable recycling market exists, are delivered to either the WTE facility or the landfill, where they are safely disposed of.

11.18 Paper Products

Question:

Will paper products be burned or recycled?

Response:

This is not an 'either' 'or' question. The Authority accepts a variety of types of paper fiber, including newspaper, magazines, cardboard, unwanted mail, office paper, beverage cartons and food boxes, in its recycling program. Paper fiber that is not or cannot be recycled (i.e., tissues, disposable diapers, paper towels, food containers, coffee filters, hand wipes) will be delivered to the plant and combusted to produce energy.

11.19 Cardboard

Question:

What will happen to cardboard?

Response:

The Authority accepts cardboard through its residential and commercial recycling programs as well as at nearly 250 drop-off locations throughout the County. The Authority also has a very successful commercial revenue-share program that pays businesses a share of the net revenue from the recycling of the material. Additionally, there is considerable private sector activity in this market. Incidental amounts that end up in the waste stream for any of a variety of reasons will be processed for energy production.



ATTACHMENT A

FLORIDA REGIONAL OFFICE
111 Second Avenue NE, Suite 1001 St Petersburg, FL 33701
Phone: (727) 824-8813 Fax: (727) 823-3601 www.sierraclub.org

March 17, 2011

Dear Commissioner Santamaria:

The Sierra Club of Florida requests that you delay the decision on the construction of a 3,000 ton per day mass burn facility to incinerate Palm Beach County's garbage. We believe that there are serious unanswered questions on the viability of this project. The Sierra Club feels that it is necessary for environmental and economic reasons to review policies for recycling, composting, reuse and source reduction before a 3,000 ton per day facility, which will add to the already existing 2,000 ton per day facility that is now operating. While future population growth may require 5,000 tons per day of disposal capacity, Palm Beach County claims a recycling and yard debris diversion rate of 30% with a goal of 50%.

We would like to propose alternatives to such a large investment in waste to energy. We have contacted Neil Seldman, who has worked as a consultant in the waste management field. Neil has worked with other counties in Florida to provide alternatives to waste to energy plants.

We believe that the County could save significant money by pushing a more aggressive recycling program rather than expanding its waste to energy component. In particular, heavy food waste could be either composted if vegetative waste or bio-digested if animal based waste. The Breakers Hotel in Palm Beach was able to experiment with a bio-digester system and was able to use its food waste on site for compost.

Another serious issue is e-waste. E-waste is waste from discarded Computer products such as monitors, printers and PC boards. These products have toxic chemicals in them, as well as valuable metals that can be recycled. If they are burned these items could create a toxic result that would have to be discarded in our land fill. In addition, what happens to plastic items and Styrofoam that do not get recycled? How much carbon will the plant release? Will paper products be burned or recycled? What will happen to cardboard? It has also been brought to our attention that this plant will require millions of gallons of water to operate daily. Where will this water come from? We believe that further study is required to answer these questions before moving forward.

New technologies are on the horizon. With the cost of fossil fuels increasing plastic and Styrofoam should become 100 percent recycled products soon. New concepts are being developed to recover gases from food waste. Right now Palm Beach County does not have mandatory recycling for businesses. Many businesses do not recycle their paper or cardboard waste. In Atlanta, the waste authority is working with a paper company to build a plant to recycle paper waste. If we did a good job of recycling our waste we would never need a 3000 ton per day waste facility. How much would we save our citizens in tip fees if recycling were mandatory for businesses?

Moving forward with this plant will mean that the County will have significant excess incineration capacity.

There are three potential problems with having this excess capacity:

- a. It can mean the import of garbage, including hazardous materials, or the restriction of recycling to make sure that there is enough BTU value in the waste stream to keep the plant running at optimal performance.
- b. It can mean a flow control ordinance, which would require all garbage being sent to the incinerators. This would artificially limit the options for businesses to divert their materials through less expensive means. For example, in most small businesses corrugated cardboard is the largest portion of the material generated. This material is a commercial commodity and can be picked up and recycled at a much lower cost than processing at an incineration facility. Horse farmers could face the same problem. Horse manure can be composted to produce topsoil, and/or digested for energy recovery (methane). There are hundreds of on-farm manure digestion systems in operation. Generators could be discouraged from applying these environmentally friendly and less expensive management alternatives.

By limiting the opportunities to recycle and process materials into new products, the County incurs a significant opportunity cost of foregoing new small businesses and jobs that contribute to the local tax base.

- c. The more electricity generated by the plants the more citizens will pay for the system. There are two forms of citizen payouts. 1. The cost of the incinerator will be seen through the tip fee for bringing County garbage to the plant. This fee will have to payoff the cost of the plant and retire the bond debt. At an estimated cost of \$500 million (conservative figure) the payout over 20 years for the County (households and businesses) will be \$1 billion. 2. The electricity will be sold to the local utility. Public Service Commission customers will have to pay premium rates for 'renewable energy' even though this is not an environmentally beneficial energy source. The local utility will have to invest about \$40 million for a turbine for the plant. This will be added to the rate base. Thus, customers will be paying for the tip fee, the premium electricity cost and the \$40 million.

Florida Sierra Club advisor, Neil Seldman, is available to discuss alternative options at this time. You may contact Drew Martin at 561-533-6814 or through email at DMandCH@aol.com to arrange a call.

Sincerely,

Drew Martin, Conservation Chair, Loxahatchee Group, Sierra Club, Florida
Dwight Adams, Waste Minimization Committee, Sierra Club, Florida



ATTACHMENT B

DRAFT

Alternative Solutions for West Palm Beach, FL
Prepared by ILSR for the Florida Sierra Club
March 2011

Background

West Palm Beach, FL has been operating a 2,000-ton per day RDF waste to energy facility for the past 20 years. Given the geological limitations of landfill availability, the county seems to have an embedded orientation to large-scale incineration as the only reliable solution to managing the waste stream.

The county claims a recycling diversion rate of 30% with a goal of 50% diversion in the near future.

The county solid waste management staff is recommending the construction of a 3,000-ton per day mass burn incinerator to assure the county of sufficient waste management capacity for the foreseeable future.

Concerns

Environmental oriented citizens are concerned about the pollution impacts of this planned facility. These concerns are underscored by evidence that garbage incineration is not neutral with regard to greenhouse gas, particulate and other emissions.¹

ILSR has been asked to advise the Sierra Club to review economic considerations, and briefly outline alternative approaches that can be implemented in lieu of a mass burn plant.² These best practices include readily replicable enterprises and policies that are currently in place. These state of the art practices have allowed large cities and small towns to reach over 60% diversion through recycling and composting, and in some cases over 70% diversion. Nantucket, MA has reached 90% diversion.³

ILSR considers the following issues to be of significant economic concerns for the County Commissioners:

¹ See Executive Summary of "Stop Trashing the Climate", ILSR, 2009; And, See, "10 Top Reasons Why Mass Incineration is Not Appropriate", ILSR BEING PREPARED BY BRENDA PLATT --- TO BE COMPLETED TOMORROW.

² ILSR has prepared the following information without detailed knowledge of how the county currently recycles 30% of its waste stream. Once this information is available details in this memorandum may change.

³ Leading communities include King County, WA, San Francisco, Los Angeles, Worcester, MA, and Toronto.

+ Capital and Operating Costs --- Capital costs for three 1,000 ton per day mass burn facility could be \$1 billion based on current estimates for a 1,500 ton per day plant proposed in Frederick, MD. That estimate for capital costs is \$500 million. In addition there are \$60 million per year costs for debt retirement and operating costs. Or, over 20 years, the Frederick plant would cost \$1.7 billion. For a plant half the size planned in West Palm Beach County.

If the plant fails to operate correctly, as has happened in Dutchess County and Washington County, NY, Detroit, Harrisburg, PA and Camden, NJ, West Palm Beach County, FL would face a financial crisis or unprecedented proportion.

If the plant operates according to vendor stipulations, there could still be significant subsidies for the County. In Montgomery County, MD a mass burn plant is operating according to design. Yet the tip fee and energy revenue does not cover all costs. The County must pay \$30 million annually. The subsidy requires Montgomery County to impose a household surcharge to cover shortfalls. In New Jersey, the state had to bail out 5 operating mass burn facilities with a state bond for \$1.2 billion.

+ Water resources --- There are other uncertainties. The mass burn plant will probably need more than 1 million gallons of water per day to generate steam and then electricity. The County financial officers must make sure that the cost of this water over the next 20 years is anticipated in the facility budget. Of course, there are environmental and economic impacts of the use of this large amount of water, which affect homeowners, businesses and agriculture.

+ Need for Landfill --- Additional considerations must also be given to the need for landfill space. A mass burn facility needs a landfill for ash, by-pass waste (waste that does not fit in the incinerator, and waste that is generated when the plant is down for routine maintenance). Landfilling may be required for as much as 20-25% of the waste stream by volume.

For these reasons, Massachusetts and New York have determined that incineration of garbage is not in the best interests of their respective states. Massachusetts has maintained its moratorium on garbage incineration. New York State has issued a technical report documenting the advantages of the alternatives to incineration.⁴ MA moratorium and NY State Beyond Waste Report

In addition to these costs, a mass burn facility which destroys raw materials presents West Palm Beach County with lost Opportunity Costs of expanding and creating small businesses, jobs and an expanded tax base.⁵ For every 10,000 tons of garbage that is burned in an incinerator, one job is created. For every 10,000 tons of raw materials recycled and composted 8-10 jobs are created as a result of value added to the materials. When the processed raw materials are used for

⁴ See, "Beyond Waste, New York State Department of Environmental Protection, 2010; Also, See **Need cite for MA report**

⁵ See, Memo on Job Creation from Recycling and Composting, ILSR/Division of Sustainability, City of Atlanta, and GA.

manufacturing, hundreds of jobs are created for every 10,000 tons consumed. Compost products add to the local economy in other ways. The use of compost saves about 10% of water use and reduces, possibly eliminates the need for pesticides and fertilizers.

Big industry and agricultural companies are now vying for the materials that the County is now planning to incinerate. These include Strategic Materials, Waste Management, Inc., Alcoa, Reynolds, Hugo Neu, Coca Cola, Pepsi Cola and many others, which currently employ tens of thousands of workers in the US. These companies are introducing facilities throughout the US and Puerto Rico in an effort to get control over raw materials.

Specific Solutions: Policies, Programs, and Enterprises

The following approaches in combination can recycle and compost as much material as the County now plans to burn. ILSR estimates the total cost of implementing these approaches is less than \$50 million over the next 5 years. This estimate includes the cost of County staff planning and oversight workers.

- + Mandatory recycling as practiced throughout the US.
- + Pay As You Throw garbage fees that encourage source reduction, composting and recycling. Seven thousand US jurisdictions use PAYT at this time.⁶
- + RecycleBank, Inc. offers a private sector approach to providing cash incentives to households to participate in recycling.
- + Voluntary backyard composting which removes about 15% of household waste from the waste stream.
- + Zero Waste Zone for restaurants, as developed in Atlanta, GA in combination with food recovery programs at the city jail and airport.
- + Resource Recovery Park for recycling and composting companies as is being implemented in Collier County and Alachua County, FL.⁷ Atlanta is now in discussions with small-scale glass, paper and plastic manufacturers,
- + Procurement for source reduction for government, industry and household purchasing.⁸
- + Extended Producer Responsibility Programs and Safe Centers which require manufacturers to take back hazardous products after their use. Households and small businesses can drop off these materials (batteries, chemicals, sharps, paint) for industry to pick up and dispose of safely, without taxing local budgets for hazardous waste management.

⁶ See, US EPA PAYT Web Page.

⁷ See, Alachua County planning documents at ilsr/recycling/Alachua.

⁸ See, Source reduction Memorandum for US EPA Region 2, ILSR/USEPA Region 2 Puerto Rico and Virgin Islands Recycling Task Forces, 2010.

+ Anaerobic Digestion systems which process organic materials (manures, biosolids, food discards, yard debris) into methane gas for energy recovery. These plants can digest biosolids and food discards together or just food discards.⁹

Suggested Next Steps

ILSR recommends the following next steps for the decision-making process in West Palm Beach Counties.

- + Postpone all decision-making on the 3,000 ton per day mass burn facility.
- + Conduct an alternatives study estimated cost \$30-\$40,000. ¹⁰
- + Comparison evaluation between alternatives and 3,000 ton per day mass burn facility with regard to costs, environmental impact, employment, water and food security.

ILSR Credentials

ILSR is a 37-year old non-profit research and technical assistance organization with offices in Washington, DC and Minneapolis, MN that works with local and state and federal government agencies, industry, foundations and community development organizations. The organization focuses on sustainable economic development. ILSR focuses on energy, agriculture, solid waste, retail, banking and finances, and communications technology.

ILSR's history and current projects can be reviewed at ilsr.org on the Internet.

ILSR's Waste to Work Program has helped change the direction of solid waste management in King County, WA, Los Angeles, Austin, Del Norte County, CA San Diego, Washington, DC, Philadelphia and many other locales. ILSR has worked for the World Bank, Bermuda National Trust, ICCLEI, and German Marshall Fund of the United States. ILSR currently is on contract with US EPA Region 2, US EPA Region 3, City of Atlanta, County of Alachua, FL, and City of Reading, PA.

Neil Seldman, PHD is co-founder and president of ILSR. He is a former manufacturer in NYC and university professorial lecturer in political science and The George Washington University.

⁹ See; Report on Operating Anaerobic digestion plants in the USD, ILSR, IBID.

¹⁰ Companies that can provide these services are: Anthony and Liss Associates, Huls Environmental Services, Resource Recycling Services, Sound Resource management, Industry Recycling Network.