

Solid Waste & Recycling

The amount and type of waste generated by a community, and the strategies employed to manage or treat that waste, contribute to the many facets of a sustainable community including human health, the environment, land use, and economic development. Waste materials originate from a variety of sources including industrial, agricultural, commercial and domestic activities.

In Miami-Dade, 3,769,683 tons of waste were managed by both the public and private sectors through landfilling, incineration, and recycling practices in 2008. This area provides information on countywide waste quantities, facility capacities, treatment strategies including recycling composition and rates, and the air pollution and greenhouse gas (GHG) emissions associated with the various strategies.

Solid Waste & Recycling

Assessment Area

The amount and type of waste generated by a community, and the strategies employed to manage or treat that waste, contribute to the many facets of a sustainable community including human health, the environment, land use, and economic development. Waste materials originate from a variety of sources including industrial, agricultural, commercial and domestic activities. In Miami-Dade, 3,769,683 tons of waste were managed by both the public and private sectors through landfilling, incineration, and recycling practices in 2008. This area provides information on countywide waste quantities, facility capacities, treatment strategies including recycling composition and rates, and the air pollution and greenhouse gas (GHG) emissions associated with the various strategies.

The County's Department of Solid Waste Management (DSWM) handles a large portion of solid waste collection. The geographic area where DSWM provides garbage and trash collections services is known as the Waste Collection Service Area (WCSA) and consists of the unincorporated part of the County, as well as nine municipalities that contract with DSWM for these services. In addition to waste pickup services, DSWM also operates 13 Trash and Recycling (T&R) drop off centers in the WCSA. DSWM also provides recycling services in the County's unincorporated area and to 11 municipalities through interlocal agreements. All other municipalities provide garbage and trash collection and recycling services to their residents.

The County contains two operating landfills (one that accepts trash and one that accepts trash and garbage), three regional transfer stations, and two closed landfills, all of which are managed by DSWM. Private landfills in the County include a landfill that accepts both trash and garbage within the municipality of Medley and two landfills that accept only construction and demolition type materials. The County also has two home chemical collection centers, both managed by DSWM.

While DSWM does not provide garbage, trash, and recyclable services to all areas of the County, it does have countywide responsibility for the regulation of waste collection, transportation of waste, and recycling activities, as well as any enforcement connected to these activities. DSWM also manages an agreement for the operation of the Resources Recovery facility (including onsite ashfill), one of the largest waste-to-energy facilities in the world.

There are challenges associated with garbage, trash, and recycling in the County, as outlined below.

SUMMARY OF KEY SUSTAINABILITY CHALLENGES

Main challenges identified through collaborative stakeholder analysis of assessment data & indicators

- The dwindling capacity of county landfills.
- An aging and antiquated system.
- Planning for the appropriate location of future facilities considering population changes and shifts due to land-use strategies changes and climate change impacts.
- The expiration of major disposal agreements with municipalities and private entities in 2015 and the expiration of the waste-to-energy facility operating contract in 2023 (with options to renew).
- An existing business model based on more tons of garbage in, more money in the system.

- The new statewide recycling goal of 75 percent (House Bill 7135) to be achieved by the year 2020.
- Disposal tonnage is significantly impacted by the economy and hurricane activity.
- Alternative disposal methods for the best use of organic waste, such as composting, will be explored in the Solid Waste Master Planning process.

ASSESSMENT DATA & INDICATORS

Data and analysis to identify key challenges & establish a sustainability baseline

Indicators presented in this area include the amount of waste each person contributes to the waste system, a breakdown of the amount of waste distributed to each facility, the amount of waste treated by various strategies, and ultimately the impact of waste on the capacities of our waste facilities. Also considered in this area are the air pollution and greenhouse gas (GHG) emissions associated with the different waste management strategies of landfilling, incineration, and recycling.

The waste per person ratio and its percentage of change since 2003 is shown in Table 1. The waste per person ratio decreased in 2003 and 2004 but climbed in 2005 and 2006 before the 2007 decrease. The 2005 and 2006 increase was caused by the waste generated by the two storms that impacted the County in 2005. More recently, the current state of the economy has had an impact on the disposal environment. Consumers are buying less and therefore disposing of less material. The reduction in tonnages has not only been felt in Miami-Dade but it has had an affect on the entire waste industry nationwide.

Table 1
 Waste per Person and Percent Change in Waste per Person
 (Annual Tonnage - Wastestream / Population)
 (FDEP Report / calendar year / gross tons)

	2003	2004	2005	2006	2007	2008
Waste/person	1.79	1.73	1.88	2.08	1.86	1.61
% Change in waste/person	-0.5%	-3.5%	8.7%	10.6%	-10.6%	-13.44%

**Note 2008 data published by FDEP*

Tables 2 a and b shows that the overall amount of waste collected by both the public and private sectors was less in 2008 than in 2003, with an increase in the amount recycled and a decrease in the amount incinerated and landfilled. While this is true, the amount of waste managed by each method has remained proportionally consistent over those years; 20 percent recycled, 20 percent incinerated, and 60 percent landfilled. Presently the County has a goal to meet a recycling rate of 30 percent, which includes all recycling including yard trash and mulching.

Table 2a
 Amount of Waste Managed through Recycling, Incineration and Landfilling by Public and Private Sector (FDEP Report / calendar year / gross tons)

	2003	2004	2005	2006	2007	2008
Recycling	746,991	709,215	775,022	918,696	823,229	775,181
Incineration	843,475	725,368	692,434	669,410	636,387	750,893

Landfilling	2,402,737	2,452,867	2,893,917	3,290,231	2,930,608	2,243,609
Total	3,993,203	3,887,450	4,361,373	4,878,337	4,390,224	3,769,683

Table 2b

Percentage: Amount of Waste Managed through Recycling, Incineration and Landfilling by Public and Private Sector (FDEP Report / calendar year / gross tons)

	2003	2004	2005	2006	2007	2008
Recycling	19%	18%	18%	19%	19%	21%
Incineration	21%	19%	16%	14%	14%	20%
Landfilling	60%	63%	66%	67%	67%	59%
Total	100%	100%	100%	100%	100%	100%

Table 3 below shows the amount of waste managed by the County's DSWM, versus the previous consideration of waste managed by both public and private facilities. The Resource Recovery facility handles the largest amount of waste in the County.

Table 3

Annual Amount of Waste Disposed or Processed at each County Disposal Facility (Tons)

	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008
South Dade Landfill	429,150	503,846	740,783	873,997	537,675	486,491
North Dade Landfill	315,522	317,758	344,439	582,782	254,285	203,310
Resources Recovery - Incinerated	582,394	495,023	495,477	533,633	534,934	570,064
Resource Recovery - Ashfill	144,100	148,769	140,800	158,057	164,439	173,854
Total	1,471,166	1,465,396	1,721,499	2,148,469	1,491,333	1,433,719

The County's available landfill capacity has steadily decreased from 7,275,674 tons in 2003 to 4,935,010 tons in 2008, a 32 percent reduction over that time period. Table 4 below shows estimates of the year by which each facility is expected to reach capacity. North Dade Landfill is the first facility expected to reach capacity sometime between 2012 and 2014. The Department has a capital project underway that will extend the capacity of the South Dade Landfill and other projects under consideration that may extend capacity at all facilities.

Table 4

Estimated Facility Capacity by Year

	Facility Estimated to Reach Capacity by Year:
North Dade Landfill	2012--2014
South Dade Landfill	2017--2020
Resources Recovery Ash Landfill	2020--2023

Table 5 shows the recycling rates for various material types for the entire County which includes the County's recycling program, other governments and private recycling.

Table 5
Waste Products Collected and Recycled (Tons) by Material Type

Materials	2000	2001	2002	2003	2004	2005	2006	2007	2008
Aluminum cans	7%	11%	42%	17%	6%	6%	4%	7%	6%
C&D debris	45%	13%	9%	13%	6%	9%	13%	9%	11%
Corrugated paper	38%	36%	26%	31%	31%	36%	29%	34%	30%
Ferrous metals	47%	51%	42%	28%	53%	43%	54%	51%	56%
Food	0%	0%	0%	0%	0%	0%	0%	0%	0%
Glass	21%	19%	30%	23%	12%	20%	17%	18%	10%
Miscellaneous	16%	14%	17%	14%	6%	5%	5%	5%	6%
Newspaper	32%	27%	22%	25%	21%	21%	28%	24%	17%
Non-ferrous metals	21%	36%	30%	51%	32%	42%	41%	41%	44%
Office paper	3%	8%	5%	5%	3%	4%	2%	6%	7%
Other paper	5%	4%	5%	6%	3%	4%	5%	6%	8%
Other plastics	0%	0%	0%	0%	0%	0%	0%	1%	1%
Plastic bottles	17%	21%	18%	10%	10%	10%	15%	17%	7%
Process fuel	100%	0%	100%	100%	100%	100%	100%	100%	100%
Steel cans	35%	39%	3%	4%	2%	12%	2%	2%	68%
Textiles	0%	0%	0%	0%	0%	0%	0%	0%	0%
Tires	31%	38%	34%	33%	22%	11%	7%	54%	69%
White goods	100%	100%	100%	100%	100%	100%	100%	100%	100%
Yard trash	4%	8%	8%	7%	7%	19%	23%	14%	14%
County Totals	25%	20%	18%	19%	18%	18%	19%	19%	21%

In 2008, the County transitioned from the dual stream recycling program in June, to the single stream recycling program, which began in July 2008 and was fully implemented by January 30, 2009. Table 6 shows that since the implementation of the Single Stream recycling program, the annual tons collected through the curbside recycle program increased by 88 percent in reference to the previous year.

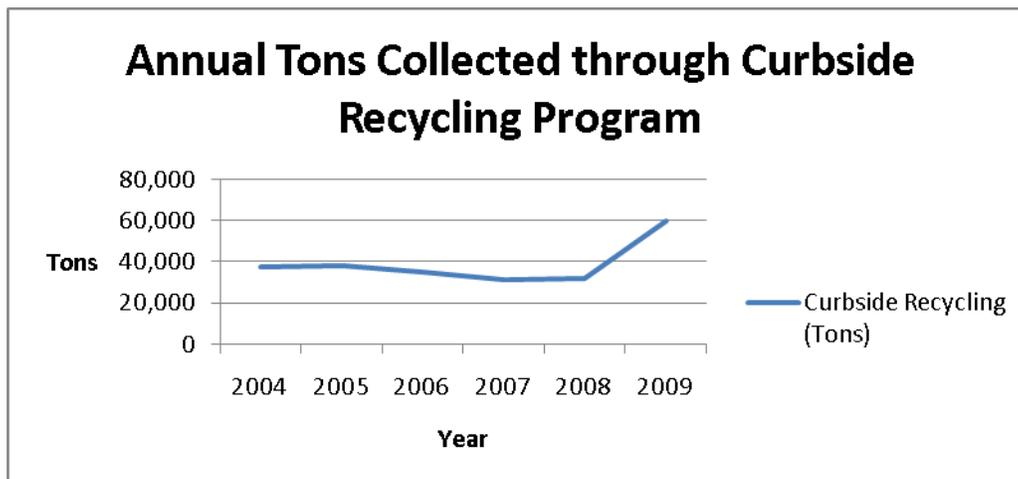


Table 6
Annual Tons Collected through Curbside Recycling Program
(Tons)

FY2004	FY2005	FY2006	FY2007	FY 2008	FY2009
37,651	37,878	34,751	31,229	31,778	59,616

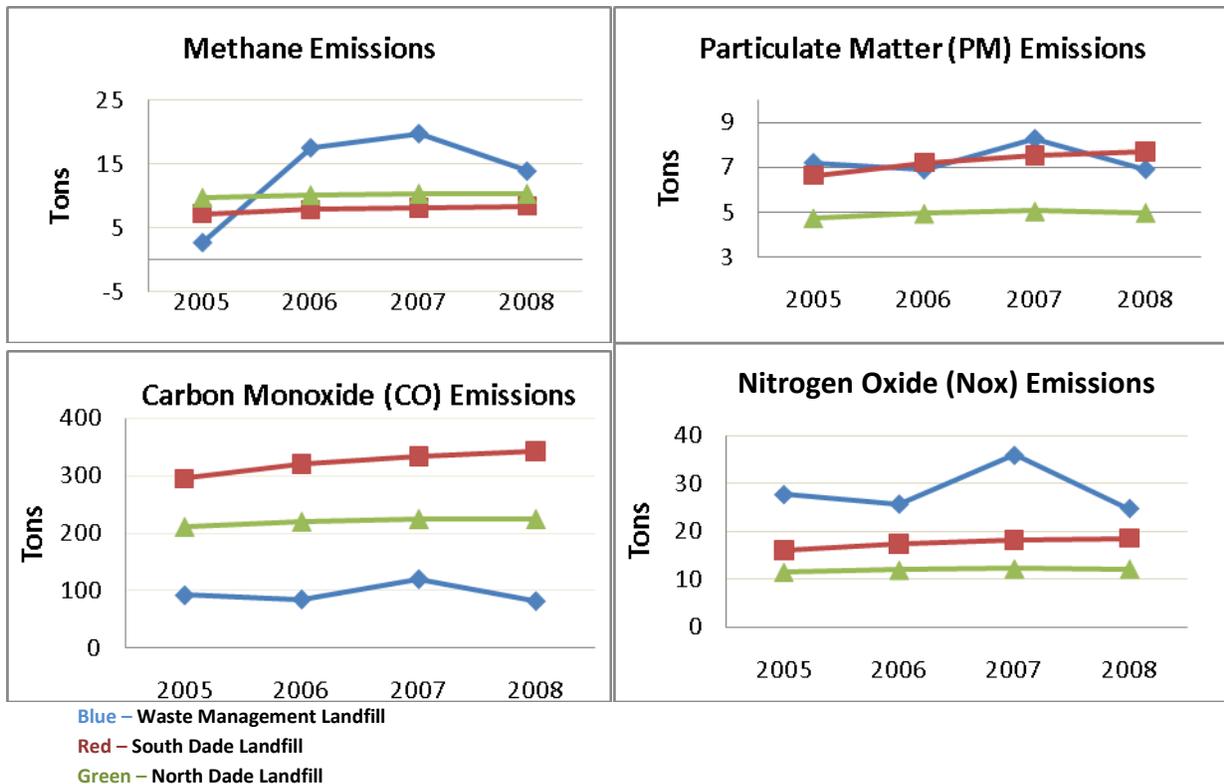
In addition to the incineration of garbage to generate electricity, the Resources Recovery facility produces RTI Biomass fuel that is sold outside of Miami-Dade County. Table 7 shows the amount of waste used to produce fuel has decreased from 179,484 tons in 2004 to 100,285 tons in 2008. The decrease in fuel production is due to the lack of availability of feedstock and mechanical difficulties at the facility.

Table 7
Waste to RTI Biomass Fuel Sold Outside Miami Dade County
(Tons)

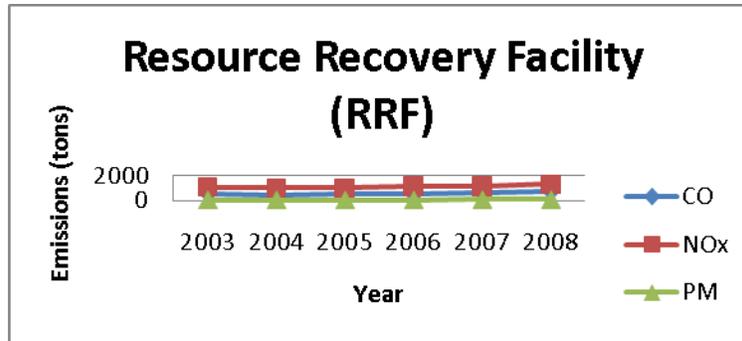
	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008
RTI Biomass Fuel	143,251	179,484	178,290	97,042	108,128	100,285

Air Pollution Emissions Associated with Incineration, Landfilling and Recycling

The charts below show emissions of the the four largest pollutants from the three major landfills in the County. Methane emissions are produced from the breakdown of organic matter in the landfill. All three landfills have gas collection systems which collects some of the methane gas, which is burned by a flare. The CO, NOx and PM emissions are by-products of the methane combustion. The spike in emissions between 2005 and 2007 is most likely a result of additional materials being landfilled due to debris from the 2005 hurricanes.



The chart below shows emissions from the Miami-Dade County Resource Recovery facility. This is the largest solid waste handling facility in the county. The waste however is not landfilled but is used as fuel to generate electricity. The CO, NOX and PM emissions are by-products of combustion of the waste. The majority of PM emissions are captured through pollution control devices. While the NOX and CO emissions are higher than those from landfilling and flaring, combustion of waste produces electricity, diverts waste from landfills and prevents the production of methane gas from the degeneration of waste.



Greenhouse Gas Emissions Reductions from Recycling

Emissions not illustrated above are those avoided all-together through recycling. By diverting waste, recycling realizes significant emissions reductions through avoidance of methane gas production from landfills. As a result of County's original GHG mitigation efforts from 1990 to 2005, over 34 million tons of equivalent CO₂ GHG's were reduced or avoided. Approximately 76 percent, or 26 million tons, of these avoided GHG emissions were due to recycling.

EXISTING EFFORTS

Consolidates current plans, goals, and initiatives related to the specific assessment area

Comprehensive Development Master Plan

The Comprehensive Development Master Plan's (CDMP) Solid Waste Sub-Element contains one goal, six objectives and 25 policies. The goal is to "Provide an integrated solid waste management system in conformity with federal, State and County law which promotes the public health, sanitation, environmental protection, operational efficiency, beneficial land use and growth patterns and is funded through fair and equitable means."

The CDMP policies call for, among other things:

- The continued development and management of a single consolidated solid waste system and shall discourage the establishment of disposal facilities not integrated in the system. (SW-5B)
- Miami-Dade County shall reduce the amount of waste requiring disposal through reliance on recycling programs or other alternative solid waste management strategies. (SW-4B)
- The County shall promote the establishment and expansion of markets for products and materials created from recycled wastes through cooperative state and federal efforts, County purchasing policies, and by encouraging the purchase of such products by County vendors, clients and citizens. (SW-4C)
- The County shall provide for the reduction of per capita production of solid waste by encouraging the use of waste reduction technologies and recyclable packaging materials, to the extent possible. (SW-4D)
- The County shall minimize the amount of yard trash disposed of in landfills through the development of alternative means that include encouraging, among other innovative programs, diversion or composting of biodegradable materials other than yard waste. (SW-4E)

Miami-Dade Solid Waste Master Plan

In addition to the goals, objectives, and policies listed in the CDMP's Solid Waste Sub-Element, DSWM is currently undertaking a master planning process that will meet the waste reduction, collection, recycling, transfer and disposal needs for Miami-Dade County for the next 50 years. The goal of this Plan is to identify and develop activities, programs, facilities, and technologies that will provide sustainability, resource conservation, source reduction, recycling, and diversion, disposal and collection options and ensure public health and environmental protection for the next generation of County residents.

The development of the plan began in June 2009 and will be completed in 36 months. Completion of the first phase is expected in 13 months. It will specifically focus on:

- Provide System Financial Stability
- Minimize Operating Costs
- Conserve Landfill Capacity
- Provide Higher Level of Customer Service
- Develop Public/Private Disposal Partnerships
- Regional Capacity for Long-Term Needs

The Plan will inventory, evaluate and assess the existing solid waste management system including, but not limited to the facilities, operations, contracts/agreements, financial state, regulatory environment, etc. and define long-range goals for the future solid waste management system in general terms regarding technologies, cost, customer convenience, environmental impacts, county-municipal relations, risk, etc.

The goals and priorities are to be developed through an open and public consensus building process involving the community, county government, municipalities, haulers, regulators and various stakeholders. It will identify and prioritize system needs in general terms as defined by the gap between the existing system and the long-term goals. It will develop corresponding criteria for evaluation of waste management alternatives. Based on the recommendations of this Plan, DSWM may amend the policies detailed in the CDMP to reflect future growth and development of DSWM.

Existing Legislation

There are federal and state legislative items that may affect DSWM operations as it relates to recycling and renewable/clean energy. The Energy, Climate Change, and Economic Security Act of 2008 (House Bill 7135) signed into law by Governor Crist created Section 403.7032, Florida Statutes. This establishes a new statewide recycling goal of 75 percent to be achieved by the year 2020. The statute directs the Florida Department of Environmental Protection (FDEP) to develop a program designed to achieve this goal and submit it to the Legislature for approval by January 1, 2010. DSWM's contribution towards the goal includes solid waste material converted to energy (i.e., waste to energy plant) and residential curbside recycling collection. Additionally, the DSWM is seeking the inclusion of landfill gas energy projects as part of meeting the recycling goal. DSWM is expanding its enforcement of the commercial recycling ordinance, which will increase overall recycling tonnage. The combination of the waste-to-energy plant, residential curbside recycling, and landfill to gas energy projects will help the DSWM contribute to reaching the state wide goal.

A comprehensive legislative item regarding Renewable Energy reflects the DSWM's ongoing efforts to both preserve waste-to-energy's inclusion in applicable definitions of "renewable

energy” and “green energy” and to provide incentives and other support for the production of such renewable energy.

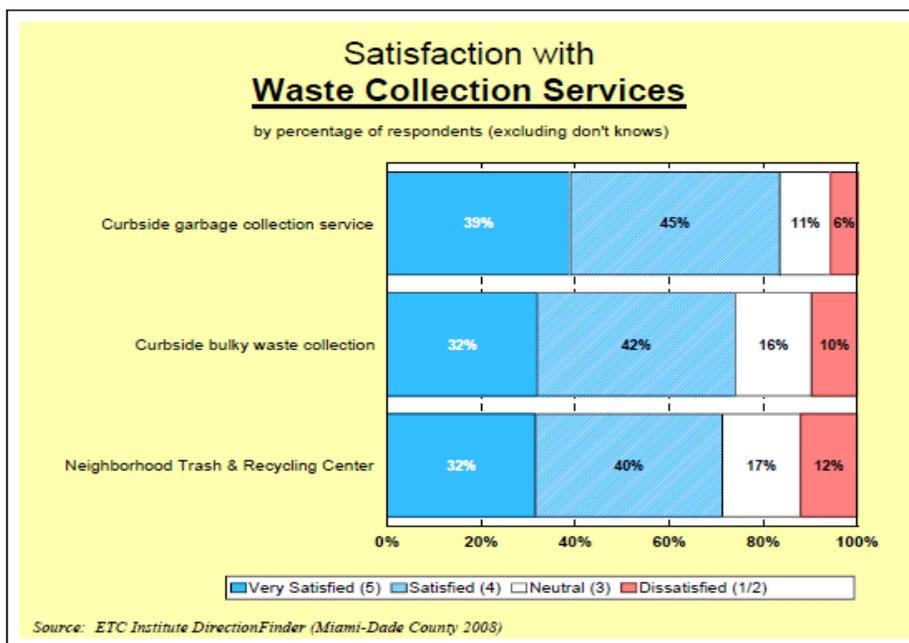
Additionally, there are two air emission standards established by the United States Environmental Protection Agency/Florida Department of Environmental Protection (USEPA/FDEP) that may be modified and therefore, could affect DSWM facilities in the foreseeable future, (Mercury and Greenhouse gases). They both include Carbon Dioxide, Methane and Nitrous Oxide. The FDEP has expressed that Mercury from the Waste-to Energy plant may require continuous emissions monitors which is equipment that analyzes stack emissions continuously on a real time basis. Currently, the stack emissions are monitored once yearly. Effective January 1, 2010, landfills and the waste-to-energy plant must keep an inventory of Greenhouse gas emissions. Data collected through the inventory will most likely be used as a basis for limiting (capping) Greenhouse gases from solid waste facilities. Facilities emitting over a certain established threshold(s) will have to offset the Greenhouse gases by buying credits and/or paying a fee. The American Clean Energy and Security Act (Federal Legislation - HR 2454), proposes a cap-and-trade system which is projected to begin in 2012.

COMMUNITY FEEDBACK

Feedback & results gathered through the planning process or surveys

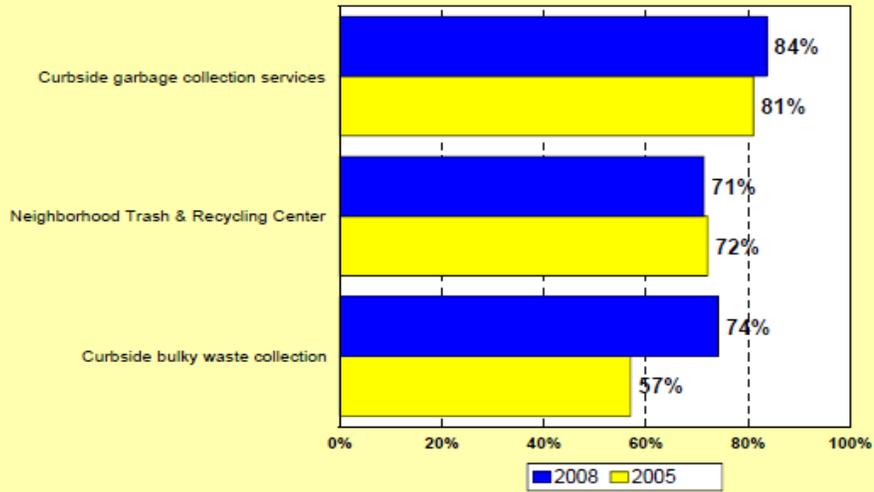
During the fall of 2008, ETC Institute administered a Resident Satisfaction Survey for Miami-Dade County to assess resident satisfaction with the delivery of major county services and to help determine priorities for the community as part of the County’s ongoing planning process. Of the 20,000 households that received surveys, 5,522 were completed (a 27 percent response rate). The survey was administered in English, Spanish, and Creole.

Below are the results related to resident satisfaction with waste collection services and recycling.



TRENDS: Satisfaction with Waste Collection Services

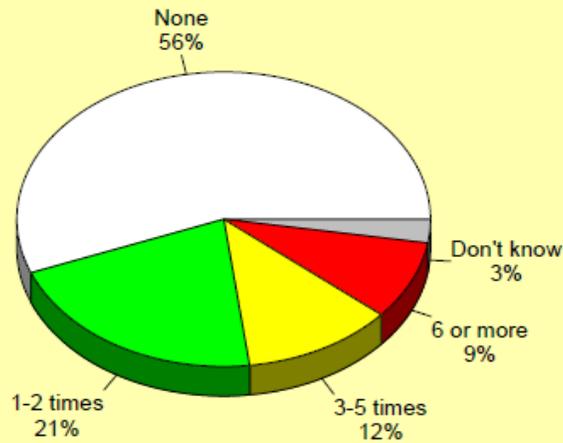
by percentage of respondents who were "Very Satisfied" or "Satisfied" (excluding don't knows)



Source: ETC Institute DirectionFinder (Miami-Dade County 2008)

During the past 12 months, approximately how many times have you taken trash to a County neighborhood trash and recycling center?

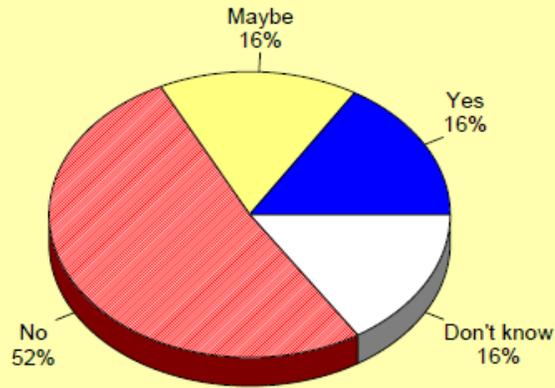
by percentage of respondents



Source: ETC Institute DirectionFinder (Miami-Dade County 2008)

Would you be willing to pay a nominal fee for each visit to a County neighborhood trash and recycling center in order to keep the annual waste fee at its current level longer?*

by percentage of respondents

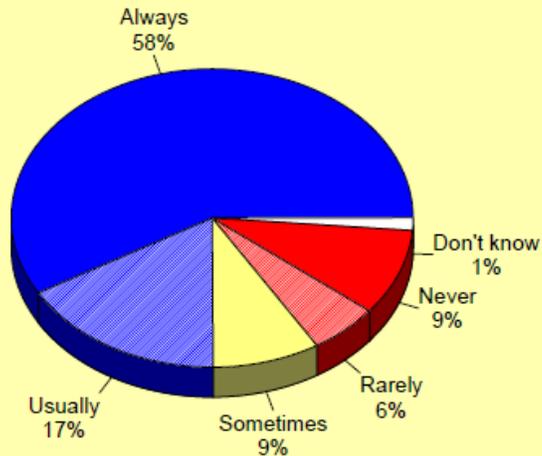


*UMSA Service Area Only

Source: ETC Institute DirectionFinder (Miami-Dade County 2008)

How often do you recycle in your home?*

by percentage of respondents

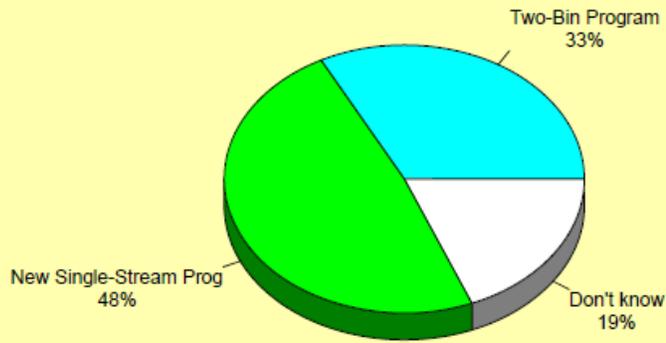


*Recycling Service Area Only

Source: ETC Institute DirectionFinder (Miami-Dade County 2008)

Which curbside recycling program is currently being used in your neighborhood?*

by percentage of respondents

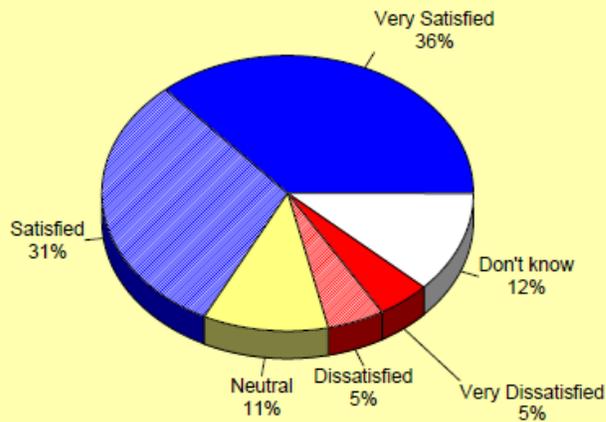


*Recycling Service Area Only

Source: ETC Institute DirectionFinder (Miami-Dade County 2008)

Overall Satisfaction with Current Curbside Recycling Services*

by percentage of respondents



*Recycling Service Area Only

Source: ETC Institute DirectionFinder (Miami-Dade County 2008)