Florida and the 2020
75% Recycling Goal

Volume 1 - Report

Prepared by the Department of Environmental Protection
for the Florida Senate and the Florida House of Representatives

Executive Summary

The over 37 million tons of municipal solid waste generated by 20 million Floridians and about 113 million visitors every year, provides many opportunities for recycling. Unfortunately, Floridians and our visitors continue to discard valuable commodities when there are better uses for those items. The Florida Legislature recognized that fact and through the Energy, Climate Change and Economic Security Act of 2008, established a statewide weight-based recycling goal of 75% by 2020 (see Appendix G). The Act instituted the 75% recycling goal, directed the Florida Department of Environmental Protection (DEP) to establish a reporting protocol and directed counties to report annually. The Legislature also established interim recycling goals: 40% by 2012, 50% by 2014, 60% by 2016 and 70% by 2018. This report summarizes the actions that have been implemented by DEP since the passage of the 75% recycling goal and includes optional program and statutory changes that may continue to improve Florida's recycling rate.

Florida achieved the interim goals established for 2012 and 2014; however, Florida's 2016 recycling rate was 56%, falling short of the 2016 interim recycling goal of 60%. The law directs that if the interim recycling goals are not met, DEP must submit a report to the Legislature identifying additional programs or statutory changes needed to achieve the goals set forth in Section 403.706, Florida Statutes (F.S.).

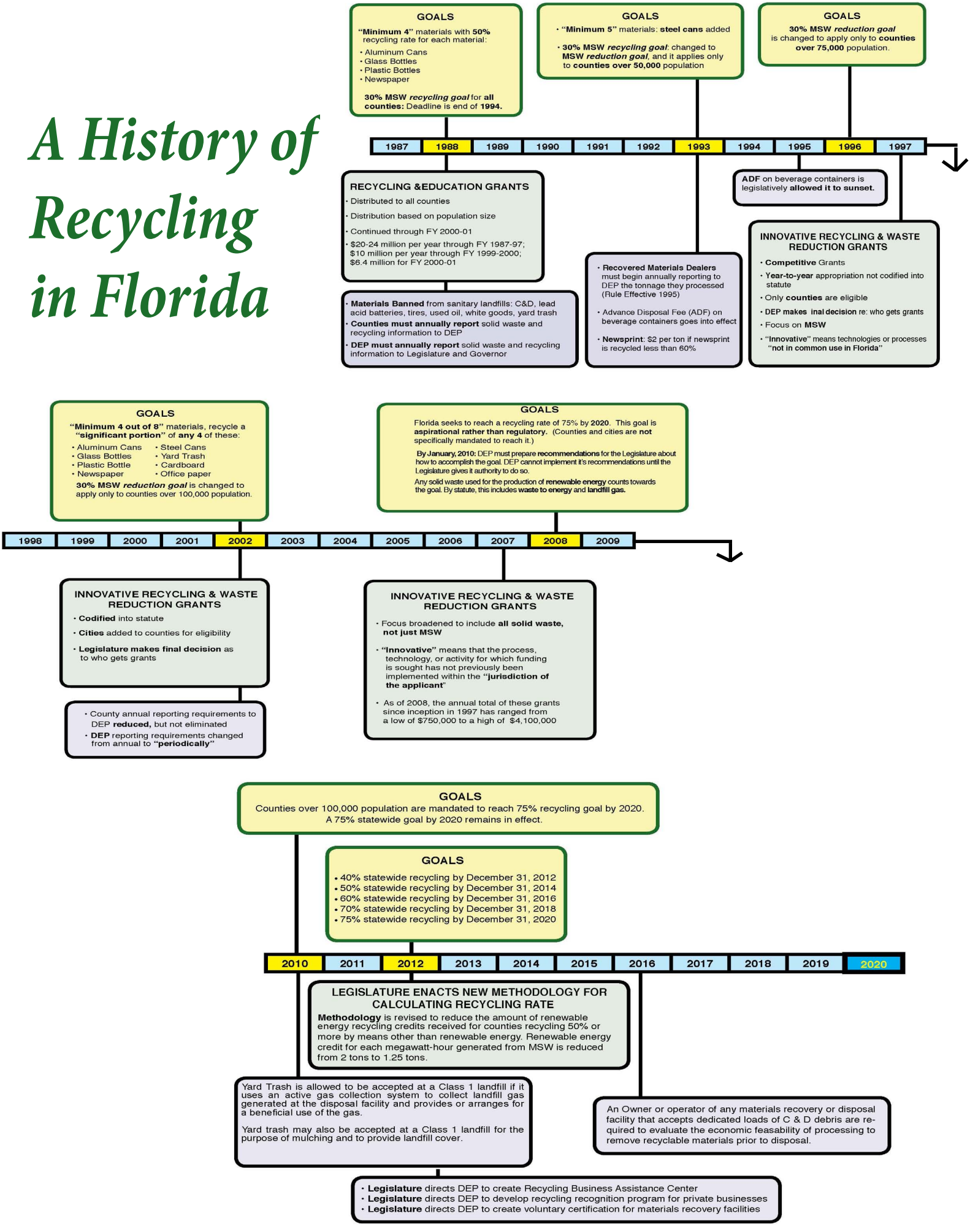
The legislation also provided that large counties (counties over 100,000 in population) not achieving the recycling goals could be directed to develop a plan to expand recycling programs. Of the 11 counties reaching the 2016 interim goal, only four counties achieved a 60% or more recycling rate by means other than renewable energy.

Anticipating that the 2016 interim goal might be out of reach, DEP has hosted or participated in 30 statewide meetings, webinars and conference calls over the last two years. The options provided in Table 1 represent direct input received from waste and recycling business stakeholders, local governments and non-governmental organizations. Implementing some or all of the suggested options will require action by the Legislature, DEP and other state agencies, as well as all of the stakeholders involved. It will also demand market solutions, smart economic choices and thoughtful regulations.

Recycling in Florida, the United States, and the world has changed significantly over the last 10 years. Many of the challenges we currently face with recycling have occurred as a result of changes in collection methods, shifts in the recycling markets and new and lighter weight packaging.

Given these challenges and others detailed in the report, the current practices in Florida are not expected to significantly increase the recycling rate beyond the state's current rate of 56%; causing it to level off. Without significant changes to our current approach, Florida's recycling rate will likely fall short of the 2020 goal of 75%.

A History of Recycling in Florida



Waste Reduction and Recycling Overview

In 2016, Florida residents and tourists generated municipal solid waste equivalent to almost 2 tons per resident per year. This is above the national average of roughly 1 ton per resident per year, since it does not count the number of tourists, as measured by the U.S. Environmental Protection Agency (EPA) and other states. Likewise, Florida's recycling efforts are not easily compared to those of other states as there is no universal methodology used for measuring progress toward recycling goals.

Florida's recycling goal is a municipal solid waste (MSW) goal; meaning that waste from industrial, agricultural, and mining operations as well as sludge from wastewater treatment is excluded from the calculations. In 2012, DEP implemented a new methodology for calculating the recycling rate to include renewable energy recycling credits as a result of legislative changes to Section 403.706, F.S. To promote the production of renewable energy from solid waste combustion, the Legislature allowed that each megawatt-hour produced by a renewable energy facility using solid waste as a fuel counts as 1 ton of recycled material, and is applied toward meeting the recycling goals. Section 403.708(12)(c), F.S., states that DEP shall, by rule, develop and adopt a methodology to award recycling credit for the use or disposal of yard trash at a Class I landfill having a gas-collection system that makes beneficial use of the collected landfill gas. In addition, the methodology outlined in Rule 62-716.480, Florida Administrative Code (F.A.C.), states that recycling credits are to be awarded for MSW used as landfill cover (daily, intermediate and final), MSW reused or returned to use in the form of fuel or fuel substitutes, and MSW processed and used as lake or land fill provided it is integral to a land or real property improvement. The new methodology also expanded upon the construction and demolition (C&D) debris materials and uses that can now count toward the recycling goal. See Appendix A, Figure 4 flowchart that explains the methodology for calculating the recycling credits.

The percentage adjacent to each new category below shows the relative contribution to the state's 2016 recycling rate of 56%.

Renewable Energy Recycling Credits – 12 %

Yard Trash Disposed in a Landfill Beneficially Using Landfill Gas – 0 %

Landfill Cover Recycling Credits – 3 %

Fuel or Fuel Substitutes – 0 %

Construction and Demolition Debris used as Lake or Land Fill – 5 %

Construction and Demolition Debris (asphalt and concrete from roads and bridges) – 3%

Waste Reduction and Recycling Overview

In 2011, prior to implementation of the new methods and criteria used to calculate the recycling rate, Florida' s recycling rate was 30%

If the same methodology was applied to the 2012 - 2016 data, Florida's recycling rate would be as follows:

2012 – 30 %
2013 – 31 %
2014 – 32 %
2015 – 33 %, and
2016 – 33 %

Figure 1

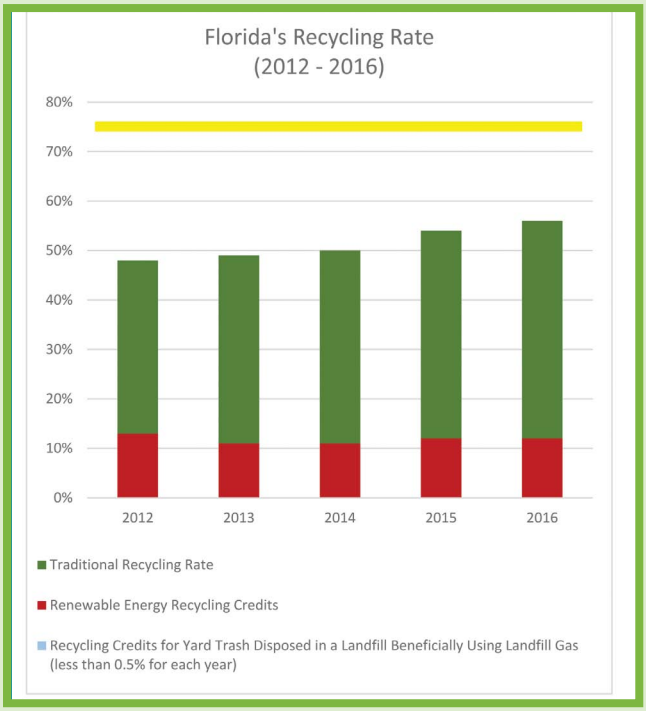


Figure 1 illustrates Florida's progress toward meeting the 75% recycling goal. In addition, the chart distinguishes between the different recycling credits received. The Traditional Recycling Rate excludes renewable energy recycling credits and recycling credits received for yard trash disposed in a landfill beneficially using landfill gas. In 2016, Florida's Traditional Recycling Rate was 44%. Renewable energy recycling credits and the recycling credits for yard trash disposed in a landfill beneficially using landfill gas accounted for 12% of the Overall Recycling Rate or Adjusted Recycling Rate of 56%. See Appendix A, Figure 1, for an analysis of the recycling rates.

Renewable energy is statutorily defined as "electrical energy produced from a method that uses one or more of the following fuels or energy sources: hydrogen produced from sources other than fossil fuels, biomass, solar energy, geothermal energy, wind energy, ocean energy and hydroelectric power." A means of creating renewable energy by using solid waste occurs through waste-to-energy (WTE). WTE is the process of generating energy in the form of electricity and/or heat from the primary treatment of MSW. Most WTE processes produce electricity and/or heat directly through combustion or produce a combustible fuel commodity. Currently, there are 12 WTE facilities that accept MSW from 22 Florida counties.

Approximately 12% of Florida's MSW is combusted in WTE facilities. Research suggests that increasing the number of WTE plants in Florida could raise the recycling rate under the 2012 methodology. For example, by strategically adding new WTE capacity in higher population areas that currently do not have access to WTE could potentially increase the adjusted recycling rate by more than 5 percent.

Waste Reduction and Recycling Overview

In addition to the new methodology and criteria established in 2012, Section 403.706(2)(d), F.S. provides that large counties (counties over 100,000 in population) that do not meet the recycling goals may be directed to develop a plan to expand recycling programs to existing commercial and multifamily dwellings, including, but not limited to, apartment complexes. The calendar year recycling goals are specified in Section 403.706(2)(a), F.S., as 40% recycling rate by 2012, 50% by 2014, 60% by 2016, 70% by 2018 and 75% by 2020. Twenty-five of the 36 large counties did not reach the 2016 interim recycling goal of 60%. Of the 11 counties reaching the goal, only four counties achieved a 60% or more recycling rate by means other than renewable energy. Two of the four counties with a traditional recycling rate of 60% or more have a mandatory commercial recycling ordinance and the other two counties have focused on C&D debris recycling.

In August 2017, DEP requested counties not reaching the goal to develop a plan to expand recycling programs to existing commercial and multifamily dwellings. The plans were originally due to DEP on October 9, 2017. However, due to the hurricanes impacting Florida, DEP granted an extension until November 10, 2017. To date, DEP has received 12 county recycling plans for 2016.

In 2014, DEP also requested County Recycling Program Plans from counties not meeting the 2012 interim recycling goal of 40%. Appendix D contains a copy of the county recycling plans. Most of the counties reported plans to increase commercial recycling as well as C&D debris recycling. In addition, all wanted to engage their residents through outreach and education. A few of the counties expressed interest in implementing organics recycling and expanding curbside recycling services.

Interim Recycling Goal	40 Percent		50 Percent		60 Percent
Calendar Year	2012	2013	2014	2015	2016
Number of Counties NOT Reaching the Goal	14	13	18	17	25

Disaster Debris

Due to number of hurricanes that impact Florida, there has been discussion about including disaster debris in the numbers used to determine the recycling rate. In 2017, the entire state of Florida, except for the panhandle, was affected by Hurricane Irma. Then a few weeks later, the panhandle felt the effects of Hurricane Nate. These hurricanes created massive amounts of debris. We will not know until 2018, when the counties report to the state, just how much disaster debris was generated.

Waste Reduction and Recycling Overview

In 2004, when Hurricanes Charlie, Francis, Jeanne and Ivan all hit the state, only 6 percent of the 3,677,851 tons of disaster debris reported was recycled. When these storms occur, there is such a tremendous amount of debris generated that the priority is to remove debris as quickly as possible and moved to a disaster debris management site for segregation and processing. Unfortunately, due to the pressing need to expedite recovery efforts, most of the materials collected are mixed in the process, segregation is complicated, and very little can be economically recycled.

Disaster debris is considered a waste anomaly and has not been included in the state waste management reports for purposes of calculating the recycling rate.

That debris is reported separately to DEP. According to the data submitted in 2004, including hurricane debris in the methodology used to calculate the recycling rate would have had a negative impact on the recycling rate due to the majority of disaster debris having to be landfilled because of time constraints.

Waste Reduction and Recycling Overview

Education and Outreach Campaign

DEP, in partnership with material recycling facilities (MRFs) across the state, has developed a statewide public education campaign, "Rethink. Reset. Recycle." This campaign addresses the need to educate Florida residents on how to reduce single stream curbside recycling contamination. Plastic bags, cords, clothing and packaging, such as, Styrofoam and plastic packaging material, are causing contamination problems that can shut down MRF operations and cause good loads of recyclables to become trash. The campaign also serves to remind Florida residents of the basics of curbside recycling: clean and dry aluminum and steel cans, plastic bottles and jugs and paper and cardboard.

The foundation of the campaign is the website, FloridaRecycles.org. The website serves as the hub for the campaign, housing informational resources including a social media kit and content, web banners, and printable materials for use by local governments and other stakeholders to educate Florida's residents on smarter recycling practices.

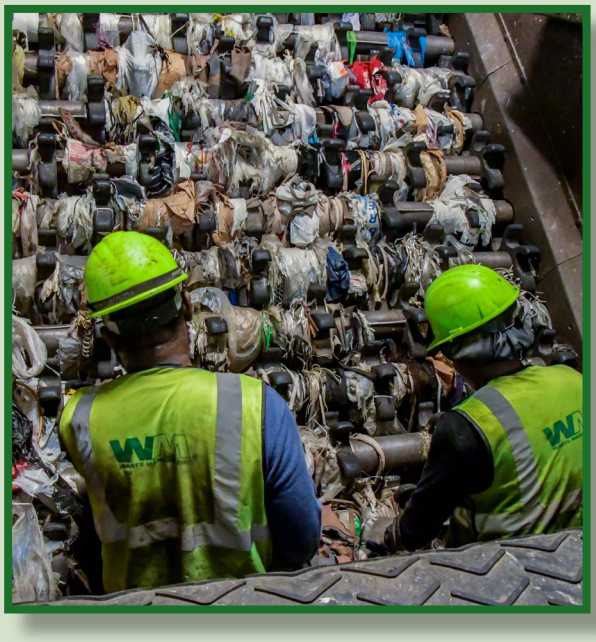
In addition to the "Rethink. Reset. Recycle" campaign, DEP is working on the following recycling options:

- Evaluating the implications of shifting from a weight-based recycling goal to sustainable materials management processes.
- Researching the concept of moving from a weight-based recycling goal of 75% by 2020, to market specific goals such as a food diversion goal or an organics recycling goal.
- Engaging Florida's state universities and the Florida Department of Education to review potential K-12 curriculum programs emphasizing waste reduction and recycling practices.
- Continuing to work with state agencies to identify recycling/cost saving measures specific to their operations. For example, exploring opportunities to reduce and recycle food waste within the Florida Department of Corrections or expanding the use of recycled glass as an aggregate replacement in Florida Department of Transportation projects.
- Collaborating with the Hinkley Center for Solid and Hazardous Waste Management to analyze the ongoing recycling of materials to determine areas where assistance is in greatest need.
- Providing counties not achieving the 2016 interim recycling goal with assistance in analyzing, planning and executing opportunities to increase recycling.

Single Stream Recycling

Background

Many counties and municipalities have instituted single stream recycling programs. Single stream recycling programs allow all accepted recyclables to be placed in a single, curbside recycling cart, comingling materials from paper and plastic bottles to metal cans and glass containers. Single stream recycling programs have been marginally successful in providing curbside collection efficiency by increasing the amount of recyclables collected and residential participation. While there are many advantages to single stream recycling, it has not consistently yielded positive results for the recycling industry. The unexpected consequence of single stream recycling has been the collection of unwanted materials and poorly sorted recyclables, resulting in increased contamination originating in the curbside recycling cart.



Contamination of recyclables occurs when residents place materials that are not recyclable into curbside recycling bins — mainly plastic bags, packaging materials including styrofoam peanuts, garden hoses, and other increasingly popular thin plastics.

Contamination hinders processing at materials recovery facilities (MRFs) when unwanted items are placed into recycling carts. For example, many residential customers may not understand that while retail plastic bags are recyclable elsewhere, they are harmful to the automated equipment typically used to process and separate recyclable materials from single stream collections. While MRFs are equipped to handle some non-recyclable materials, excessive contamination can undermine the recycling process resulting in additional sorting, processing, energy consumption, and other increased costs due to equipment downtime, repair or replacement needs. In addition to increased recycling processing costs, contamination also results in poorer quality recyclables, and increased rejection and landfilling of unusable materials. Although some local governments have implemented successful single stream recycling programs with low contamination rates, contamination rates for other programs have continued to rise, in some cases reaching contamination rates of more than 30-40% by weight.

Single Stream Recycling

Glass

Single stream contamination can result from the cross-contamination of recycled materials. For example, recent trends with decreases in the use of newsprint and other fibrous content has contributed to the reduction in recyclable paper that would otherwise cushion glass in single stream recycling. As a result, there is an increased likelihood that recycled glass will become broken, both in single stream containers and during collection, transportation and processing. Smaller glass pieces resulting from breakage during collection and transport can be comingled with paper, reducing the value of the paper or causing the entire load to be sent to the landfill.

Action

In an effort to address single stream recycling challenges, DEP has engaged with various stakeholders to advance the discussion of reducing contamination rates.

- DEP has established many partnerships with federal, state and local governments and non-governmental organizations (NGOs) in the process of identifying and addressing the problems associated with single steam recycling. DEP partnered with the Florida Recycling Partnership and Recycle Florida Today to host a webinar concerning the mounting contamination issues associated with single stream recycling (see Appendix B, Figure 1). The purpose of the webinar was to provide education and information to the industry on reducing cross-contamination of recycled materials, increasing the quality and quantity of materials recycled, and yielding the highest percentage of materials that are accepted in municipal recycling programs.

- DEP provided written guidance to local governments regarding the issues associated with single stream recycling and recommendations for reducing the contamination (see Appendix E, Figure 1).

- DEP has participated, with the University of Miami, on a Technical Advisory Group (TAG) that is conducting a contamination research project supported by the Hinkley Center for Solid and Hazardous Waste. The purpose of this research project is to assess the impact of different waste collection methods (i.e., single stream, dual stream, source separation and mixed waste) on contamination rates in material recovery facilities and paper mills.

- DEP has developed a statewide education and outreach initiative, titled "Rethink. Reset. Recycle.", to increase residential recycling participation and reduce single stream contamination. A Hinkley Center for Solid and Hazardous Waste research project has been evaluating recycling education messages through focus group feedback, and draft advertisements have been developed to present to waste industry partners. The reception to these advertisements has been overwhelmingly positive and led to members of Florida's recycling industry offering to partner with DEP and raise funds for further professional development and implementation.

Markets

Background

As Florida continues to increase its recycling rate, future growth is dependent on healthy markets for the collected recyclable materials. Healthy markets create demand for recyclable materials and economic development through high paying jobs and growth of the existing tax base.

These markets are commodity driven and subject to the ebb and flow of market demands. Over the past few years, the demand has been negatively impacted by increased supply, and a decrease in end markets for collected materials. Most significantly, the export market has slowed substantially as China has virtually closed off many of its previously vibrant markets. The resulting depression of commodities prices is impacting recycling industry profitability and growth.

In an effort to support the healthy markets for recyclable materials, DEP has engaged state agencies, private industry and the public on several internal and external activities.

Recycling Business Assistance Center

In July 2010, the Legislature created the Recycling Business Assistance Center (RBAC) within DEP. RBAC's goal is to assist in the development of markets for recyclable materials to support achievement of the 75% recycling rate by 2020. The core mission of RBAC is to coordinate with state agencies and the private sector to develop new markets and expand existing markets for recyclable materials locally, regionally and globally.

RBAC provides assistance to recycling businesses at all levels of the supply chain, as well as potential partners, the Legislature and the public. RBAC's website, located at https://floridadep.gov/waste/waste-reduction/content/rbac-business-assistance, provides guidance to help increase recycling markets, creates connections within the industry, and increases awareness of services provided by RBAC and DEP. In the last year, RBAC has consulted with approximately 25 businesses and individuals interested in Florida recycling opportunities.

The Florida Recycling Loan Program

The Florida Recycling Loan Program was created in 1995 to provide access to capital for the purchase of equipment and machinery to expand recycling capacity in Florida. The program offers long-term, fixed-rate loans of up to $200,000 at interest rates up to 2% below Prime. The program is limited to for-profit small businesses that are legally licensed and operating in Florida, creditworthy startup companies or out-of-state firms considering expansion into Florida. Eligible recycling companies must have a net worth of less than $6 million and less than 100 employees.Since its inception, the Recycling Loan Program has executed 37 loans to 30 companies totaling over $4 million. The equipment purchased has ranged from extruders and conveyors to optical sorters.

Markets

Recycling Recognition Program

The Recycling Recognition Program was created by DEP to encourage private businesses, institutions, schools, public organizations and citizens to increase recycling. DEP monitors and recognizes outstanding recycling efforts around the state. Since its inception in 2012, the Recycling Recognition Program has presented over 40 awards to a variety of large and small businesses, public organizations and individuals.

Southern Waste Information eXchange, Inc.

Since its inception in 1981, the emphasis of the Southern Waste Information eXchange, Inc. (SWIX) has been on encouraging and facilitating sound environmental and cost-effective alternatives to the landfilling, incineration or treatment of solid waste through direct interaction with waste generators in both the public and private sectors. To facilitate this objective, SWIX maintains a toll-free hotline (1-800-441-SWIX) that is used to assist generators with their waste management needs, with an emphasis on the recycling and reuse of waste materials. SWIX is a resource that can be used directly by the thousands of public and private waste generators in the southeast. The SWIX Online Database (WasteXchange.org) provides up-to-date information on waste materials that are available from as well as wanted by private firms and government agencies.

In addition, WasteXchange.org lists a wide range of waste management services (e.g., recycling services, collection and transportation services) which can be used by waste generators and managers.

SWIX is a free service designed to help businesses, industries and other organizations find markets for materials that have been traditionally discarded. Registered users can post both wanted and available listings, similar to a classified ad section. Available materials can be listed by type, quantity, frequency of availability, geographic location and date. They may also include photos of the materials. Users can also post detailed wanted listings, specifying the type(s) of material they need and the frequency they need them.

Additionally, SWIX facilitates a variety of events that support the collection and dissemination of information useful in the achievement of the 75% goal, such as collection/training events, technical advisory groups and market development workshops.

Actions

In an effort to address specific markets and marketing challenges, DEP has engaged with various stakeholders to advance the discussion on developing and growing markets for recyclable materials.

Markets

- **Markets Technical Advisory Group**
  In December 2016, DEP convened a TAG comprised of public and private industry stakeholders to discuss opportunities to improve and expand markets for recyclable materials generated in the state, and assure the continued viability and growth of Florida's business infrastructure. The meeting included business owners, waste management service providers, waste management and recycling consultants, local, state and federal government representatives, and nonprofit organizations involved with waste management and the recycling industry. These participants, in an open and moderated discussion format, formulated specific recommendations to DEP about current impediments to increasing Florida's recycling markets and what actions the state can take to overcome these obstacles. Meeting notes can be found in Appendix C, Figure 1.

Agencies

- **Florida Department of Transportation** (DOT) – Several meetings and conference calls have occurred between DEP and DOT staff. The focus of the meetings was to assist DOT in identifying opportunities to increase the use of recyclable material in projects throughout the state. Potential opportunities were found with organics/compost in highway projects, and incorporating glass products in road and bridge materials. Additional meetings were arranged to directly connect DOT with organics and glass producers.

- **Florida Department of Management Services** (DMS) – A meeting was held with DMS to discuss current state procurement processes. The discussion centered on ways the state can increase the overall consumption of recyclable and recycled materials.

- **Florida Department of Correction** (DOC) – A meeting was held with DOC to discuss opportunities for recycling decommissioned equipment.

- **Enterprise Florida, Inc.** – DEP contacted Enterprise Florida to discuss available programs and processes that support the establishment of businesses involved in the processing, production, and consumption of recyclable material in the state.

- **Florida Department of Economic Opportunity** (DEO) – Several meetings have been held with DEO to provide information on the value of recycling and the recycled materials industry as it relates to employment, business establishment and growth, and expansion of the tax base.

- **Agency for State Technology** (AST) – Several meetings were held with AST regarding the recycling of electronics, specifically the safe disposal of computers and cathode ray tubes.

- **Private Sector**
  DEP has engaged various recycling industry leaders to discuss issues and opportunities relevant to recyclable materials, including current challenges in collection and processing of recyclable materials, business development and growth. Specifically, meetings were conducted to discuss organics and composting with Scotts Miracle-Gro Company, glass and related materials with Strategic Materials, and electronics recycling and certification programs with A1 Assets, Inc.

Construction & Demolition Debris Recycling

Background

Construction and demolition (C&D) debris consists of materials that are generated from residential and commercial construction, renovation and various types of demolition. C&D debris materials include wood, metals, brick, concrete, asphalt, wallboard, rocks, soil, tree remains and other vegetative matter. Only those materials that are non-water soluble and non-hazardous can be considered C&D debris.

In 2016, C&D debris made up 30% of the MSW waste stream.
See Appendix A, Figure 2

C&D debris waste may be disposed of at permitted C&D disposal sites or permitted landfills. C&D disposal sites do not have to meet the more stringent construction and operating requirements of Class I and Class III landfills; therefore, the disposal costs (tip fee) per ton at C&D disposal sites are less than at Class I and III landfills. Demographics also play a role in C&D debris recycling efforts. Tip fees at landfills and disposal sites in south Florida are considerably higher than in central and north Florida, creating an incentive for more C&D debris recycling to occur there. In central and north Florida, it generally costs less to dispose of C&D debris at landfills than to recycle it. In addition to low tipping fees, the lack of recycling infrastructure in central and north Florida is another deterrent to recycling. Limited markets for certain materials such as treated wood, sheetrock/drywall, and roofing materials inhibit recycling of those materials.

According to the county recycling reports submitted to the FDEP for 2016:

- *Currently 60%, or 6.7 million tons, of Florida's C&D debris is recycled.*

In 2010, the Legislature determined that the recycling of C&D debris was essential to reach the 75% goal. As a result, Section 403.706(2)(b), F.S., was adopted, directing counties to implement a program for recycling C&D debris as part of their efforts to attain the recycling goals. The Legislature also created Section 403.707(9)(g), F.S., requiring that by January 1, 2012, to the extent economically feasible, all C&D debris must be processed prior to disposal.

Since 2012, the C&D debris recycling rate has increased from 40% to 60%. This increase is a direct result of accounting changes made. Materials that had not counted toward the goal in the past are now included. While Florida is doing well in some areas of the state at recycling C&D debris, there are still C&D materials that are not being recycled or counted.

Construction & Demolition Debris Recycling

If 75% of the C&D debris collected had been recycled during 2016, it would have increased Florida's overall recycling rate and resulted in realization of the 2016 interim recycling goal.

Figure 2

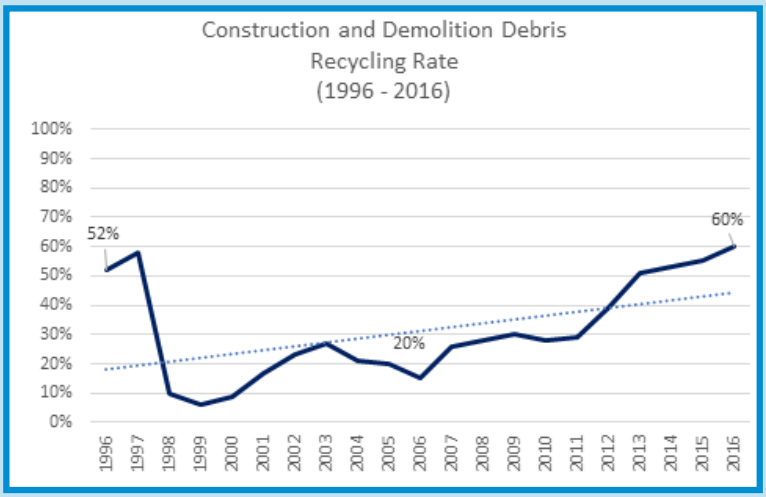


Figure 2 shows how the recycling rate has changed over the years in conjunction with methodology changes as to what can be included in the recycling rate for C&D debris. In 1998, the definition of what could count toward the recycling rate changed to exclude C&D debris used for lake fill and land fill, asphalt and concrete for road construction. In 2012, the excluded items were once again included in the C&D debris recycling rate.

Actions

DEP has engaged various state and local governments, recycling industry leaders and other stakeholders to discuss issues and opportunities associated with C&D debris recycling.

- In November 2016, DEP held a webinar for C&D recyclers, waste haulers, county recycling coordinators and other interested stakeholders to provide information on the opportunities and benefits associated with increasing C&D debris recycling. Presenters included DEP, EPA and the University of Florida. A copy of the webinar can be found in Appendix B, Figure 2.

- In February 2017, DEP hosted a webinar for C&D recyclers, waste haulers, county recycling coordinators and other interested stakeholders on trends in C&D debris recycling with presenters from C&D debris recycling facilities, DOT and a road and bridge contractor. A copy of the webinar can be found in Appendix B, Figure 3.

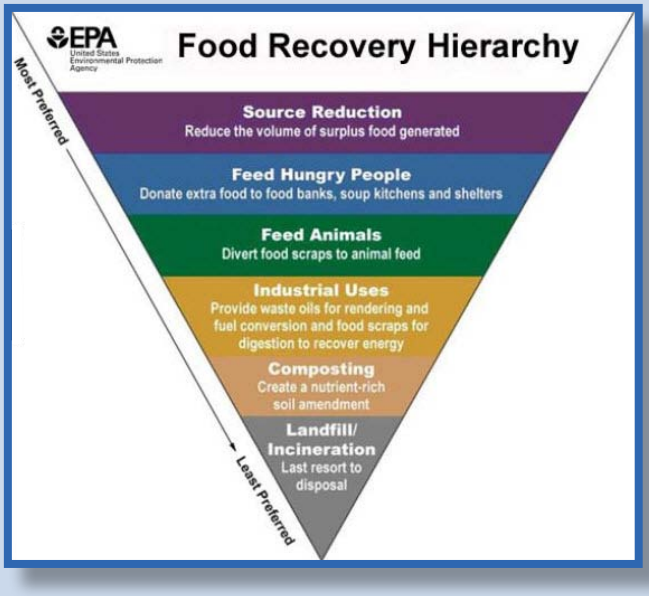
- FDEP has had several discussions with the FDOT regarding incorporating more recycled C&D products in road projects.

- In July 2017, DEP led a meeting with industry representatives and other stakeholders to discuss the present state of C&D debris recycling in Florida. Participants were invited to provide ideas and recommendations on opportunities to increase C&D debris recycling in the state. A copy of the meeting notes can be found in Appendix C, Figure 2.

Organics Recycling

Background

Reducing organics from the waste stream is vital for the state to reach its 75% recycling goal by 2020. Organics, which includes food waste, yard trash and paper, are one of the largest fractions of waste, by weight, generated in the state. Of the 36 million tons of MSW generated in 2016, organics accounted for 36% of Florida's waste stream. A breakdown of the Organics Management in Florida can be found in Appendix A, Figure 3.



The focus of Florida organics recycling has been on the production and use of compost made from solid waste and materials handled in source-separated organic processing facilities (SOPFs). The materials in SOPFs include yard trash, manure, animal byproducts and biosolids. In 2016, Florida had approximately 260 SOPF facilities processing over 3 million tons of organics that were diverted for beneficial use. The majority of these facilities managed yard waste only. The definitions for compost and compost related processes and materials can be found in Rule 62-709.201, F.A.C.

Even though the focus for diverting organics in Florida has been on composting, the reduction of food waste should also be considered when developing strategies to reduce organic waste. EPA estimates that more food waste reaches landfills and incinerators in America than any other single material in our everyday trash. In addition, EPA states that by keeping wholesome and nutritious food in our communities and out of our landfills, we can also begin to help the 48 million Americans that live in food insecure households. EPA and the U.S. Department of Agriculture have established a national goal to reduce food waste by 50% by 2030.

Organics recycling has many environmental benefits including diverting organics waste from incineration and landfilling, treatment of pathogenic organisms, and stabilization of nutrients and organic compounds. With 12.5 million tons of organic waste generated in Florida, properly managing organics is essential to increasing the state's overall recycling rate. Figure 3 shows the various management methods and practices for organic waste materials.

Figure 3 shows the various management methods and practices for organic waste materials.

Figure 3

Solid Waste Management Hierarchy	Organic Materials Management Practices
Reduce	Landscaping to eliminate yard trimmings No-bag grass mowing Eliminate food waste
Reuse	Leftovers to food banks Leftovers to animal feed
Recycle	Home composting Centralized composting Anaerobic digestion
Energy Recovery	Waste to energy Alternative technologies (pyrolysis & gasification) Anaerobic digestion
Disposal	Landfill

*Kessler Consulting

Organics Recycling

Action

DEP has been working in partnership with federal, state and local governments, industry stakeholders and NGOs to identify potential strategies to reduce the organics waste stream. The purpose of these partnerships is to develop actionable items, policies and programs based on the feedback and discussion from the organics industry of Florida.

- Education is a key factor in changing the public's behavior and understanding with respect to organic waste. DEP partnered with Recycle Florida Today and the Florida Recycling Partnership, to educate local governments, businesses and citizens through a series of webinars focusing on the management of organics. The webinars gave an overview of organics from the federal level down to the state level; i.e., the State of the State of Organics in Florida and an in-depth look at potential strategies; including Florida's past road map and specific strategies concerning food recovery and composting. These presentations can be found in Appendix B, Figures 4-5.

- DEP conducted a strategic planning session and stakeholder's discussion with Florida's recycling and organics industry at the Recycle Florida Today Annual Conference in June 2016. The session resulted in six categories for focus: economics and incentives, policy, generation, diversion, infrastructure and collection, and knowledge and education. The notes from the meeting can be found in Appendix C, Figure 3.

- DEP developed an Organics TAG, comprised of local government and industry representatives. The goal for this TAG was to assist in the development of organics strategies for Florida by focusing on the six categories determined from the prior stakeholder's discussion. The notes from the TAG meetings can be found in Appendix C, Figures 4-5.

- DEP contracted with Kessler Consulting to re-establish the Florida Organics Recycling Center for Excellence (FORCE) website. FORCE provides a framework and clearinghouse to promote organics recycling, food diversion and research in a statewide effort to streamline compost processing, research, demonstration, marketing and education in Florida. It also provides a map of Florida composting facilities. The FORCE website has recently been updated to add a page for DOT to use as an organics recycling resource page. This page will help DOT in improving the beneficial use of compost and organics recycling products and materials in Florida. The website can be found at www.floridaforce.org.

- DEP, with assistance from SWIX, conducted a workshop about organics in conjunction with Recycle Florida Today's Winter Summit in January 2017. The workshop covered the status of Florida's evolving strategy for organics recycling, as well as existing organics recycling efforts throughout the state. In addition, presentations on various organics recycling technologies such as anaerobic digestion, biogas, composting, food waste recovery, and revisions to the existing FORCE website were included on the agenda. Downloads of the presentations from the Florida Organics Recycling Workshop can be found on the SWIX website at http://southernwasteinformationexchange.com/florida-organics-recycling-workshop-january-24-2017-proceedings/.

Commercial Recycling

Background

Florida's commercial sector generates 68% of MSW, twice the amount generated by the single-family residential sector. This offers one of the greatest potentials for expanding recycling in Florida. The commercial sector currently has a recycling rate of 54%. The 2016 data suggests that even if the residential sector were to recycle 100% of the MSW generated, the 75% recycling goal could not be achieved without increasing recycling from the commercial sector.

The focus of recycling programs implemented by local governments in over the last two decades has been primarily on the residential sector, with only 64 cities and nine counties mandating commercial recycling programs. Enforcement and technical assistance vary greatly among those jurisdictions, from none to very active, which is reflected in their commercial sector recycling rates.

Actions

DEP has been working to engage public and private stakeholders by providing education and information on the benefits of recycling and recognizing entities that have met the current recycling goal of 60%.

- DEP partnered with the Florida Recycling Partnership and Recycle Florida Today to host a webinar for recycling coordinators and other interested stakeholders on commercial recycling education. The webinar focused on effective communication to engage commercial establishments on the importance of recycling. This presentation can be found in Appendix B, Figure 6.

- Pursuant to Section 403.7032, F.S., DEP developed the Recycling Recognition Program to encourage private businesses, institutions, schools, public organizations and citizens to increase recycling. Organizations and individuals that meet or exceed the current recycling goal of 60% are recognized for their outstanding recycling efforts.

- Pursuant to Section 403.7032(3), F.S., DEP established the Public Sector Recycling Reporting Program. Each state agency, community college and state university, including all buildings that are occupied by municipal, county, or state employees and entities occupying buildings managed by DMS, must at a minimum, annually report all recycled materials to the county using DEP's designated reporting format.

Education and Outreach

Background

Educating the public about recycling is the most important component to all successful recycling programs. In a state as vast and diverse as Florida, education is most effectively done at the local level. Recycling programs are county/city specific and vary greatly across the state. The type of service available, collection methods and materials accepted often differ from county to county and in some cases, differ from county to city. Public education should be tailored to the local recycling programs by the local recycling programs.

Actions

DEP has been working to increase recycling rates through grant programs, educational opportunities and the development of a statewide outreach campaign.

- From 1988 through 2003, DEP distributed approximately $247 million in Recycling and Education Grants to Florida counties. A portion of that funding was used to expand and market local recycling programs and provide education to the public. These presentations can be found in Appendix B, Figures 6-7.
- DEP recently partnered with the Florida Recycling Partnership and Recycle Florida Today to host a series of webinars focusing on residential and commercial recycling education.
- In 2016, DEP initiated a public/private partnership with waste industry groups to address rising single stream contamination rates and boost residential participation in curbside recycling statewide. DEP has begun development of a comprehensive statewide education and outreach campaign with our industry partners titled "Rethink. Reset. Recycle."

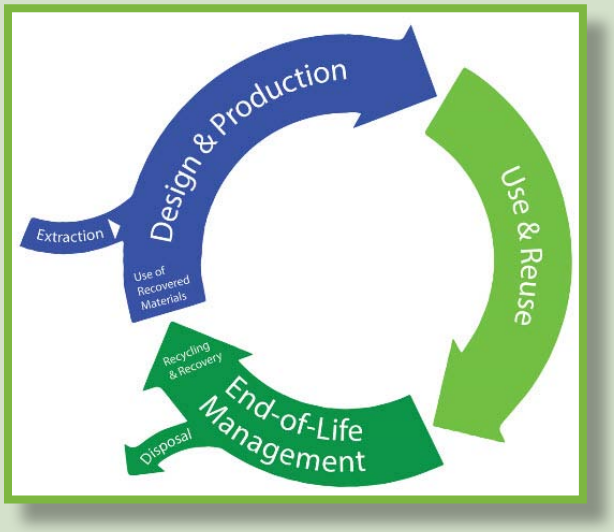
rethink. reset. recycle.
FloridaRecycles.org

Sustainable Materials Management

Alternative approaches that recognize the differences among waste components with respect to environmental and resource outcomes are referred to as Sustainable Materials Management (SMM).

SMM is a systematic approach to using and reusing materials more productively over their life cycles. SMM has become critical due to recent EPA reports showing both an increased global demand for finite resources and an overall shift in production toward countries which are less material efficient. By advancing SMM initiatives in Florida, we ensure the availability of resources and more efficient use of energy, water and materials, as well as a reduction of volume and toxicity of waste.

Florida's recycling industry, EPA and DEP have been conducting research and holding discussions about the achievability of weight-based goals, such as Florida's 75% Recycling Goal, and the practicality of implementing SMM goals in Florida. The state's recycling goal has helped propel Florida's recycling rate forward; however, it only accounts for one area of environmental protection. No one single goal can measure the full environmental impact of the materials used from cradle to grave. Multiple goals can be set, depending upon the environmental attribute(s) that are most important to the state, such as maximizing landfill capacity, minimizing toxicity or improving water quality protection.



Dr. Tim Townsend, a professor with the University of Florida, has been conducting research on SMM and Florida's recycling goal using grant funding provided by the Hinkley Center for Solid and Hazardous Waste. He is conducting a detailed analysis of the environmental impacts of the materials that are being recycled and the effects that these materials have on the environment through the end of life. Below is a summary of Dr. Townsend's research to date. The full report, The State of the State of Waste Management in Florida, will be released by the end of the year.

Sustainable Materials Management

A Report from Dr. Tim Townsend

Florida's 75% recycling goal, similar to waste management benchmarks established by other states and local governments, is a weight-based recycling rate: for every 100 tons of solid waste collected, the goal is to recycle (or recover energy from) at least 75 tons. Use of a weight-based recycling rate goal, however, poses inherent limitations. First, source reduction, the practice of reducing the weight of materials generated as solid waste in the first place, is not properly accounted for using a recycling rate. Source reduction represents the preferred strategy among all waste management options. If a community promotes and accomplishes source reduction of a heavily recycled material, the overall recycling rate for that community would decrease. Second, the weight-based recycling rate approach treats all materials the same, regardless of each material's environmental, social or economic benefit through recycling.

In recognition of the limitations of weight-based recycling targets, especially in times of challenging recycled commodity markets, several government agencies and solid waste industry members are now beginning to evaluate alternative strategies for tracking progress of solid waste management programs. Alternative approaches that recognize the differences among waste components with respect to environmental and resource outcomes are often referred to as sustainable materials management (SMM) approaches. The US Environmental Protection Agency (EPA) defines SMM as "a systemic approach to using and reusing materials more productively over their entire life cycles." SMM evaluates the different environmental consequences of how individual materials are managed at the end of their useful life (e.g., recycled, combusted, landfilled), consequences of a material's extraction, production, and active life are considered where possible.

Several tools are now available to the solid waste profession to incorporate SMM approaches into system evaluation and decision making. Several life cycle assessment (LCA) platforms have been developed specifically focused on waste management alternatives. One of the more common tools is the US EPA's Waste Reduction Model (WARM). WARM allows a user to assess the relative difference between waste management alternatives with respect to two environmental consequences: carbon emissions and energy consumption. For example, a community evaluating two different recycling programs, each targeting a different material, could compare the relative difference in energy production or consumption, not only with respect to the actual energy demands of the process, but in consideration of the savings associated with the use of recycled material instead of virgin materials early in the materials' respective lifecycles. Other LCA tools allow users to evaluate additional environmental consequences, such as impact on water, air and humans. A notable example of the integration of SMM into policy-making for municipal waste management is the program recently adopted in Oregon. Oregon has shifted its management focus to a materials management approach that views discards as materials with a goal of encouraging sustainable design and production, use and consumption, and end-of-life management of products.

Continued

Sustainable Materials Management

The 2050 Vision and Framework for Action developed in 2011 provides 50 actions to achieve the 2050 vision of "producers making products sustainably, people consuming sustainably, and materials having the most useful life before and after discard." The Oregon Department of Environmental Quality will adopt a method for calculating recovery rates based on the rate of energy savings achieved by recovery or other methods may be adopted by rule that include reductions in greenhouse gas emissions and water conservation. These methods for calculating recovery rates are referred to as "outcome-based calculation methods" that result in "outcome-based recovery goals". Along a similar theme, EPA Region 4 is working with the Georgia Department of Natural Resources on a SMM focused pilot program using life cycle information on environmental impacts of materials production and consumption in Georgia to set priorities and develop a SMM strategic plan.

In Florida, the Hinkley Center for Solid and Hazardous Waste Management is currently sponsoring research to explore how SMM principles can be aligned with the State's 75% recycling goal to allow local governments opportunities to still strive for the 75% goal but in a manner that rewards source reduction activities and considers the overall impacts of the solid waste program, not simply on the weight of materials managed in different fashions. The research focuses on identifying alternative solid waste management approaches that if implemented would provide an increase in recycling rates and an offset in greenhouse gases or energy use. Some alternatives include diverting a third of MSW collected in the top five populated counties that currently do not have a WTE facility to a WTE facility, recycling major curbside materials to 75%, recycling food waste to 75%, and recycling C&D and yard trash to 75%. No single alternative resulted in the state reaching a 75% recycling rate by weight. Only a combined approach of multiple management strategies would result in reaching the state's target. Among the research tasks underway, effective recycling rates are being developed that correspond to environmental outcomes such as greenhouse gas emissions or energy use associated with solid waste management programs. Providing materials management goals in a form similar to the typical mass-based recycling rates that policy makers, government officials, and the public are most familiar with may provide an efficient path for integrating life cycle concepts into waste management public policy.

Dr. Tim Townsend

Hinkley Center for Solid and Hazardous Waste Management

Dr. Townsend's research highlights the need to take a closer look at the current recycling goal and the possibility of refocusing the efforts. DEP recently conducted a meeting with Florida's recycling industry that focused on the question of whether we continue on the path to the 75% weight-based recycling goal until 2020 or consider the possibility of changing to a SMM goal. As noted, this would be the second shift in methodology since the 75% goal was adopted in 2008. Most stakeholders who have been involved in discussions believe that the goal or the methodology should be refocused; understanding that this type of change will probably not occur quickly. There was no consensus on what the new goal should be; however, most would like to see a transition toward sustainable materials management. The notes from this meeting can be found in Appendix C, Figure 6.

The use of weight-based targets has inherent limitations and is a challenge. While some counties have achieved the interim weight-based goals and are on track to meet or exceed the 75% goal, overall the state did not meet the 60% weight-based interim goal.

For the state to reach the weight-based 75% recycling goal would require a multi-strategy approach to capture and recycle a larger portion of the waste stream, which would involve funding and statutory mandates, as well as building additional Waste to Energy facilities that are costly to build. A shift toward sustainable materials management would refocus the goal to reduce the life cycle environmental impacts of materials. SMM provides a goal that is focused on the environmental attributes that are most important to protecting Florida's environment, society and economy.

Conclusion

Recycling in Florida has changed vastly over the last 10 years. Many of the challenges have occurred due to changes in collection, shifts in the recycling markets and new and lighter weight packaging. DEP has been working in partnership with the State's local governments and the commercial and institutional sectors to achieve the statutory, weight-based recycling goal of 75% by the year 2020. This goal applies to all counties over 100,000 in population, which covers 95% of the state's population and MSW generated.

Florida's 2016 recycling rate was 56%, which falls short of the 2016 interim recycling goal of 60%. Florida recycling industry has been successful in continuing to raise the recycling rate since the inception of the current goal in 2012. However, without significant changes to the current approach, Florida's recycling rate will likely fall short of the 2020 goal of 75%.

Options provided by recycling industry stakeholders are summarized in Table 1. The table illustrates possible changes by type, including statutory, policy, regulatory and local level decisions, as well as recommendations for new or additional programs. These options suggest a variety of changes that could lead to improvement to Florida's recycling efforts at the state and local level.

It is important to note that the weight-based goals, as described in the legislation, are aspirational. Dr. Townsend's research suggests that, even if many of the options presented in Table 1 were implemented, the 75% goal may not be achieved. Further, there is a developing consensus in other states and at the federal level that suggest using a weight-based goal may not result in efficient or effective recycling; rather, incorporation of source reduction and sustainable materials management concepts into a comprehensive statewide recycling program may be needed.

Table 1: Summary of Options

Categories of Options	Statutory Changes				Additional Programs
	Statutory Changes	Policy Changes	Regulatory	Local Level Decisions	
Single Stream Recycling					
Create a Recycling Equipment Grants Program	X				X
Create a Recycling Education Grants Program	X				X
DEO to increase recycling market development	X				X
Research Projects (Glass)					X
Markets					
Identify specific goals/milestones for recycling market development in the state's economic development agencies	X				
Implement program to increase procurement in state/local government and colleges & universities				X	X
Fund new technology grant or loan programs for targeted materials	X				X
Partner with AST to establish a state term contract for end of life management of electronics		X			
Expand resources of RBAC to bring new recycling industries to FL	X	X			
Offer tax incentives for recycling businesses to relocate to FL	X				X
Engage with state personnel appointed to serve as economic development liaisons (section 288.021, F.S.)		X			
C&D Debris Recycling					
Require registration of concrete processors	X		X		
Implement a statewide landfill ban for specific materials.	X		X		

Categories of Options	Statutory Changes				Additional Programs
	Statutory Changes	Policy Changes	Regulatory	Local Level Decisions	
Remove “economically feasible” language from Section, 403.707(9)(g), F.S.	X		X		
Mandate C&D debris processing	X		X	X	
Create sales tax exemption for purchasing recycled C&D materials	X				X
Extend sales tax exemptions (section 403.715, F.S.) to the private sector for resource recovery equipment	X		X		
Create a disposal surcharge/rebate program.	X		X		
Organics Recycling					
DACs could prepare a biennial report to DEP identifying compost markets (section 403.714(2), F.S.)	X				
All state agencies and local governments and their contractors could provide DEP with an annual report detailing the amount of compost procured	X			X	
Provide funding for DACs and DOT to fulfill the statutory requirement in section 403.714(4), F.S.	X				X
Replace the term “compost” or “composted” with “recycled organic(s)” in sections 403.714(2), (3) and (4), F.S.	X				
Create legislation to protect food donor liability and standardize labeling	X				
Provide tax incentives, such as tax deductions or credits, for farms and businesses that make food donations	X				X
Provide economic incentives, such as low interest loans, tax deductions or credits, for composting equipment to expand composting	X				X

Categories of Options	Statutory Changes				Additional Programs
	Statutory Changes	Policy Changes	Regulatory	Local Level Decisions	
infrastructure and increase composting capacity					
Create an Organics Diversion Grants Program	X				X
Provide funding for FORCE to become more than a clearinghouse website for organics diversion and recycling		X			X
Provide funding to the Florida Department of Health (DOH), in consultation with DEP for the development of a statewide education and outreach campaign on food donation and liability to be promoted by health inspectors when working with restaurants and hotels throughout Florida.	X				X
Provide funding or grants to county extension offices or local governments to develop and provide a community composting training program	X			X	X
Provide funding for DEP, in cooperation with Florida Universities, for the development of a K-12 Composting Curriculum emphasizing the implementation of composting from cafeteria scraps (School Cafeteria Discards Assessment Project - SCrAP Program), Sharing Table and producing less food waste by implementing waste reduction and recycling practices	X			X	X
Require the DEO and Enterprise Florida, in cooperation with DEP, to support recycling market development and offer	X				X

Categories of Options	Statutory Changes				Additional Programs
	Statutory Changes	Policy Changes	Regulatory	Local Level Decisions	
incentives for corporations using recycled material, such as compost, in the products that are being sold in Florida					
Research and evaluate the environmental and financial efficacy of the collection of organics at the curbside for recycling		X			X
Research the requirement to use organic compost in Brownfield Remediation/Redevelopment, new construction, landscaping, spring watersheds or other sensitive ecosystems		X			X
Evaluate and determine the composting capacity and collection and processing infrastructure needed in order to expand the composting markets in Florida		X			X
Research the idea of moving from a mass based recycling goal of 75% by 2020 to a markets specific goal, such as a food diversion goal or an organics recycling goal		X			X
Evaluate the effectiveness of mandatory recycling or a ban on disposal of commercial organic wastes by businesses and institutions that dispose of a large amount (to be determined) of organic waste		X			X
Commercial Recycling					
Mandate commercial recycling	X			X	
Create a Recycling Equipment Grants Program that allows local governments to purchase infrastructure for	X				X

Categories of Options	Statutory Changes				Additional Programs
	Statutory Changes	Policy Changes	Regulatory	Local Level Decisions	
initiation or expansion of commercial recycling efforts					
Education and Outreach					
Create a Recycling Education Grants Program that supports the continued efforts of local governments to enhance education about recycling and contamination to their residents	X				X
Additional Programs and Statutory Changes					
Amend Section 403.706(2)(a), F.S., to also apply the recycling goal to cities with a population greater than 50,000.	X				
Shift from a weight based recycling goal towards a sustainable materials management focus.	X				

Special thanks to the cities and counties of Florida for their contributions of data for this report.

Thank you to the following organizations for their commitment and assistance:

Southern Waste Information Exchange
University of Florida Hinkley Center
Florida Recycling Partnership
Recycle Florida Today
All stakeholders that participated and provided information invaluable in the creation of this report