

# **Biomass Management**

Recycling of Food Scraps by Industrial Waste Management Facilities

Tag Words: biomass; recycling; industrial waste; landfills; renewable resources; glass; plastics; paper; cardboard; compost

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## **Summary**

The unsustainable practice of dumping refuse into a landfill is finally becoming a reality for most of the developed world in the 21st century. Landfills are hazardous to the environment and humans alike, not economically feasible, and a waste of valuable renewable resources. Composting organic wastes is a safe and effective solution. Compost turns food scrap into quality soils that give back to the community in so many more ways than imagined in terms of stimulating the economy and health. Just as Americans recycle glass, plastics, paper, and cardboard, some states in the US are implementing curbside pick up of food scraps for businesses and residents that divert solid waste from landfills to be turned into quality soils. Currently in New Jersey, Waste Management and Central Jersey Waste only provide services to large institutions and there is no law as in other states and several countries that forces residents to recycle. Only until an increase in demand for these services or a law is passed will there be widespread curbside pick-up. In this paper, we discuss in more detail the drawbacks of landfills and benefits of composting. In addition, we propose a bill to legislation that models successful green bin programs in California, Washington, and Canada.

## **Video Link**

Biomass Management: [http://www.youtube.com/watch?v=Do6d\\_Z8bS\\_8](http://www.youtube.com/watch?v=Do6d_Z8bS_8)

## **The Issue: Compost Management**

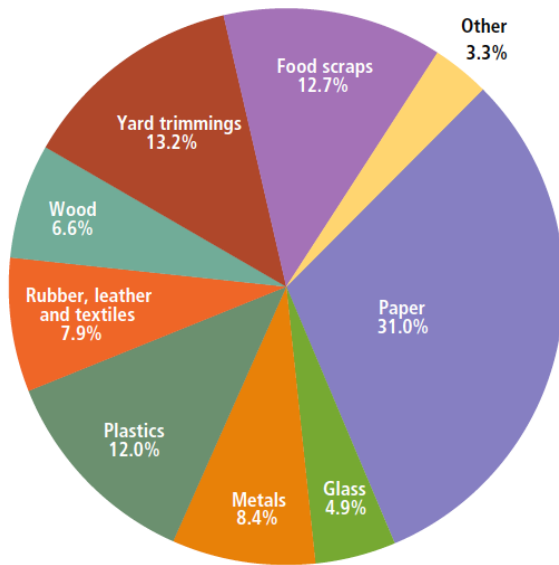
### Food is a Contributor to Global Warming (AJ)

The reality of global warming is a legitimate concern facing our society today. With the average temperature of the earth on the rise an unrecognizable planet is a possibility for future generations. To combat the increase in greenhouse gas emissions, government plans and regulations have been put into action across the country. However, the oldest recycling technique known to man composting may be the easiest and cheapest way to save the environment. The composting of organic materials is not one of the solutions used by a majority of states across the country, but is growing ever so popular among the states on the west coast. If composting was to be adopted into mainstream society, the benefits would go beyond the reduction of waste build up in landfills. In a time of economic struggle, a new program to transport residential food waste to a facility for proper disposal can increase revenue for waste management companies, and in-turn create more jobs or increase in capital investment.

In one of the yearly reports put out by the Environmental Protection Agency in 2007, the disposing of solid waste products such as food is continuing to contribute to the increase of greenhouse gas emissions in a variety of ways. The first being in the way our garbage is broken down while in landfill. When waste just sits and piles up as in a dump, air is unable to get through to all the matter that is decaying in the middle of the pile. During this type of decomposition there is a significant production of methane gas. This calls for major concern since methane which happens to be a greenhouse gas is twenty-one times more potent than carbon dioxide. Even though we often hear about carbon dioxide emissions and global warming, methane is potentially a larger threat with continuous build up at landfills. Second, are the instances when our trash is incinerated. Such techniques are carried out on a daily basis by airports regarding international trash to avoid invasive species and other harmful microorganisms. When waste is incinerated it produces carbon dioxide as a byproduct. This data may be surprising to some, because there is an unawareness to the legitimate threats methane causes amongst citizens. The future according to the data is not a bright one. These numbers have been continually on the rise since 1960 when the EPA began recording this type of data (EPA, 2009).

Contrary to popular belief the majority of the garbage we produce can be recycled in one way or another. Food is one of these materials that is thrown into the garbage around the country daily. However, food is one of the easiest materials to recycle through composting. Composting is the combination of plant or animal materials along with other organic material that decompose into a rich soil. One fact that some people are unaware of is the amount of waste they produce each day that can be recycled through composting, food being at the top of this list. In various studies food waste falls into the category of municipal solid waste or MSW. MSW is waste that is essentially made up of all our household waste. This waste is then collected by a municipality in your area, and brought to a landfill to be disposed of. In 2008 the Environmental Protection Agency (EPA) conducted a study on the municipal solid waste produced in the United States in that year. The pie chart shown below is a representation of the data collected from that study. The chart depicts a breakdown of 250 million tons of waste that was collected, and how it is distributed by percentage.

Total MSW Generation (by material), 2008  
250 Million Tons



As illustrated in the pie chart above 12.7% of waste collected from the home was food scraps (the purple shaded area). In pounds, this would come out to 31,250,000 tons of food. The chart is not a depiction of all the waste generated in the United states in 2008, but only the breakdown of 250 million tons of it. The actual number posted by the EPA in the Municipal Solid Waste Generation, Recycling, and Disposal in the United States Detailed Tables and Figures for 2008 shows the total volume of food waste to be over 160 million tons (EPA, 2009). Over five times the amount demonstrated in this study. The amount of food that is thrown out on a yearly basis is remarkable, and to think that food beat out plastics, metals, and glass comes to be a surprise considering the other three are generally recycled.

The average person produces 3 pounds of waste per day(Bensky, p.32), so if this statistic is applicable to all 8,707,739 (2009 est.) residents living in New Jersey the state is capable of producing around 26,123,217 pounds garbage per day. A long term solution to this problem is not only possible, but the rewards will far exceed any drawbacks. The implementation of a curbside food waste pick-up program will not only help reduce the quantity of trash that ends up in the dump by 3,134,786 pounds per day, but will increase the revenue of the companies that participate and could possibly create new jobs in the state.

As illustrated in the pie chart, the amount of food waste generated is over 250 million tons per year, and will continue to grow as long as population continues to increase. This constant rise in food waste is contributing to the increase of both methane and carbon dioxide gas emissions, and in turn aiding in the greenhouse effect that is currently warming our planet. There is so much of this gas being generated by landfills in fact, that if all the food waste generated each year in the U.S. was to be composted instead of thrown in the trash and ending up in a landfill, the reduction in carbon dioxide emissions would be equal to taking roughly 6 million cars off the road (Howard, p.18). New food waste disposal techniques will be inevitable as landfills continue to be over filled. With states on the west coast already diverting residential organic waste to capable

recycling facilities, New Jersey can help lead the way in the evolution of waste disposal here on the east coast.

(Matt Wysokinski)

### Benefits and Applications of Compost

#### *Erosion Control*

After the compost has been processed, there are many practical and economical uses for the nutrient rich soils. Companies such as Filtrex international, an erosion control and storm water management company, have been very successful in selling locally made compost for erosion along highways, construction sites, and agricultural applications. Filtrex has been able to sustainably recycle organic materials from feedstocks, yard trimmings, and food scraps by following standards of the US Composting Council. The manager of the company has stated that compost is more effective when installed as long filter beams when compared to silt fences in the treatment of surface water, namely, the reduction of suspended solids in water sources improving the quality of our water. In addition, composting has proven to be a time and money saver. Installation is faster than traditional methods of erosion control and when the compost has fulfilled its purpose, it does not need to be removed or disposed. The price upfront may be more expensive, however, in the end it can be less (EPA, 2003).



(EPA,2003)

#### *Agriculture*

When compost is used in agriculture, it has resulted in good yields and quality crops. Despite the fact that the materials are readily available on farm lands, many farmers have reverted to the use of synthetic fertilizers and pesticides. Swine and poultry farmers can use the nitrogen rich manure; straw, food scraps and wood provide good carbon sources. The benefit of composting is that it produces high levels of humus that hold limiting nutrients such as nitrogen and water much better than soils merely supplemented with fertilizers. Compost also contains macro and micronutrients necessary for healthy plant growth. In addition, the biological activity of compost is the key to the break down the organic matter for continual replenishment of bioavailable forms of nutrients to plants (Organic Farming Systems, 2010). For example, bacteria convert organic nitrogen to inorganic nitrogen, which is the form of nitrogen plants use. They also remediate contaminants to less toxic reactive forms for the environment. In fact, synthetic fertilizers actually kill the beneficial microorganism. Excess synthetic fertilizers, with very soluble and high concentrations of nutrients, cause toxicity to plants (top heavy plants with no poor established root systems) and leaching into water supply (North Lakes). Comparative analysis of

nutrients in quality farm compost to synthetic fertilizers shows that the cost of \$100/ton dry compost \$60-70/ton dry is reasonable. Clearly, compost creates much more fertile and sustainable soils economically (Organic Farming System, 2010).

### *Urban Farming*

City farming is on the rise providing employment opportunities and increased food security for low-income families. Cities that are wealthy are also farming for environmental reasons as well as trying to curb hunger. Compost provides cheap, fertile soil for low-income families who use significant portion of their income for food. It provides families with more fresh nutritious sources of foods and thus improves the health of the people. With population growth on the rise, locally grown foods contribute to a significant portion of world food production and reduce the loss of product from transportation and storage. Sewage and waste disposal are a health concern linked to 5.2 million deaths from unsanitary conditions. With recycling of household food wastes and sewage, conditions that harness hazardous pathogenic bacteria will be alleviated as well as pollution of water supply. Grey water can be reused to irrigate crops. Urban farmers in Mexico City have been reported to recycle 4,000 tons /day of city food wastes farming, while women in Bogota, Colombia bring in more income than their husbands by city farming. In Argentina, Rosaria is a very large and poor city where Vermiculture is inexpensive and popular technique of composting. If more Americans were willing to compost, they could benefit as well by spending considerably less on groceries, gain an appreciation for the environment, get exercise, and get their RDA and better choices of fruits and vegetables (City Farms).

### *Biogas and Biofuel*

With increasing populations there will be more pressure to supply more renewable energy that does not have detrimental effects on the environment. If the biogas produced from decomposition of the organic waste, like manure, sewage, and crops with C/N ratio of 25, is harnessed in large scale composting operations, this could be used for heat, electrical, and mechanical energy. Methane, a greenhouse gas, has the highest energy yield of 13 kcal/g and account for 55-65% of the total biogas; CO<sub>2</sub>, also a greenhouse gas, is the second major biogas accounting for 35-45% biogas. A biogas digester also reduces the carbon load by 30-60%, which makes a more rich fertilizer and soil amendment. Nutrients such as nitrogen are transformed into more bioavailable forms in a biogas digester; dissolved ammonia which can be nitrified to nitrate for plants. Other important nutrient such a phosphate and potassium salts are not affected. This nutrient rich sludge can be used to transform unproductive fields into farmlands. Composting the organic waste in separate facilities will produce less greenhouse gases than in a landfill, where unsustainable levels of methane are produced; gases that are produced can be used more efficiently. Pathogens that would be thriving in a landfill would not in a biogas digester, which is maintained in anaerobic conditions for a long time, killing harmful bacteria, viruses, protozoa, and helminth ova. Another advantage of using organic waste in biogas production is the odors are contained in a close system. Advantages of using organic matter strictly for producing compost vs. biogas technology: better elimination of pathogens, higher humus content, easier transportation of solid material, no drying of material necessary, storage without loss of nitrogen. For more information on the pros and cons of biogas technology, refer to table 1 (Polprasert, 2007).

Another form of renewable energy is liquid biofuel in the form of ethanol, which is valuable for purposes other than energy production as well, can be generated by fermentation of sugar, starch, and cellulose containing wastes; extensive research has been done using corn. The ethanol needs to be separated from fermented byproducts and distilled. It has decent energy content of 7.3 kcal/g (Polpraser, 2007).

Recent research has worked on trying to isolate a bacteria strain that could break down a wide variety of organic material and could withstand high temperatures. They genetically engineered it to produce ethanol instead of lactic acid. It could metabolize a variety of waste from basic agricultural crop waste to woodchips and cardboard. Traditionally, production of bioethanol was formed from fermentation using yeast, but this new bacterial strain will be less expensive and more efficient. This is good news for the UK, who produces an excess 7 million tons/year of straw (Gray, 2008).

Advantages	Disadvantages
Produces large amount of methane gas. Methane can be stored at ambient temperature.	Possibility of explosion.
Produces free-flowing, thick, liquid sludge.	High capital cost. (However, if operated and maintained properly, the system may pay for itself.)
Sludges are almost odorless, odor not disagreeable.	May develop a volume of waste material much larger than the original material, since water is added to substrate. (this may not be a disadvantage in the rural areas of developing countries where farm fields are located close to the village, thus permitting the liquid sludge to be applied directly to the land, serving both for irrigation and as fertilizer.)
Sludge has good fertilizer value and can be used as a soil conditioner.	Liquid sludge presents a potential water pollution problem if handled incorrectly.
Reduces organic content of waste materials by 30-50 percent and produces a stabilized sludge for ultimate disposal.	Maintenance and control are required.
Weed seeds are destroyed and pathogens are either destroyed or greatly reduced in number.	Certain chemicals in the waste, if excessive, have the potential to interfere with digester performance. (However, these chemicals are encountered only in sludges from industrial wastewaters and therefore are not likely to be a problem in a rural village system.)
Rodents and flies are not attracted to the end product of the process.	Proper operating conditions must be maintained in the digester for maximum gas production.
Access of pests and vermin to wastes is limited.	Most efficient use of methane as a fuel requires removal of impurities such as CO <sub>2</sub> and H <sub>2</sub> S, particularly when the gas is to be used in internal-combustion engines.
Provides a sanitary way for disposal of human and animal wastes.	
Helps conserve scarce local energy resources such as wood.	

(Polpraser, 2007)

### Import and Export of Waste

There is import and export of waste in many of the southeastern states. South Carolina Department of Health and Environmental Control have investigated how much of the waste is imported and tracked where the waste has come from. They found that over 1.5 million tons was imported, while Virginia and Georgia (see chart below) were the only ones which allowed more waste in 2008. Sadly, some states did not even track or collect data on how much waste is imported and exported. They also found that Most of the waste imported to South Carolina came

from New York and North Carolina, however, with about 520,000 and 392,000 tons in 2008, respectively. However, NJ imported 205,660 tons of waste to South Carolina or 13% (see chart below) of the imported waste, which is not insignificant. Interestingly, they are receiving garbage from many states to be dumped at one landfill and at the same time exporting wastes from another landfill in the same state (see chart below) (DHEC, 2009). This practice does not make any sense, yet it is still being done. If we composted the biodegradable materials, this practice would not be necessary and improve the air quality by eliminating the transportation of these wastes.

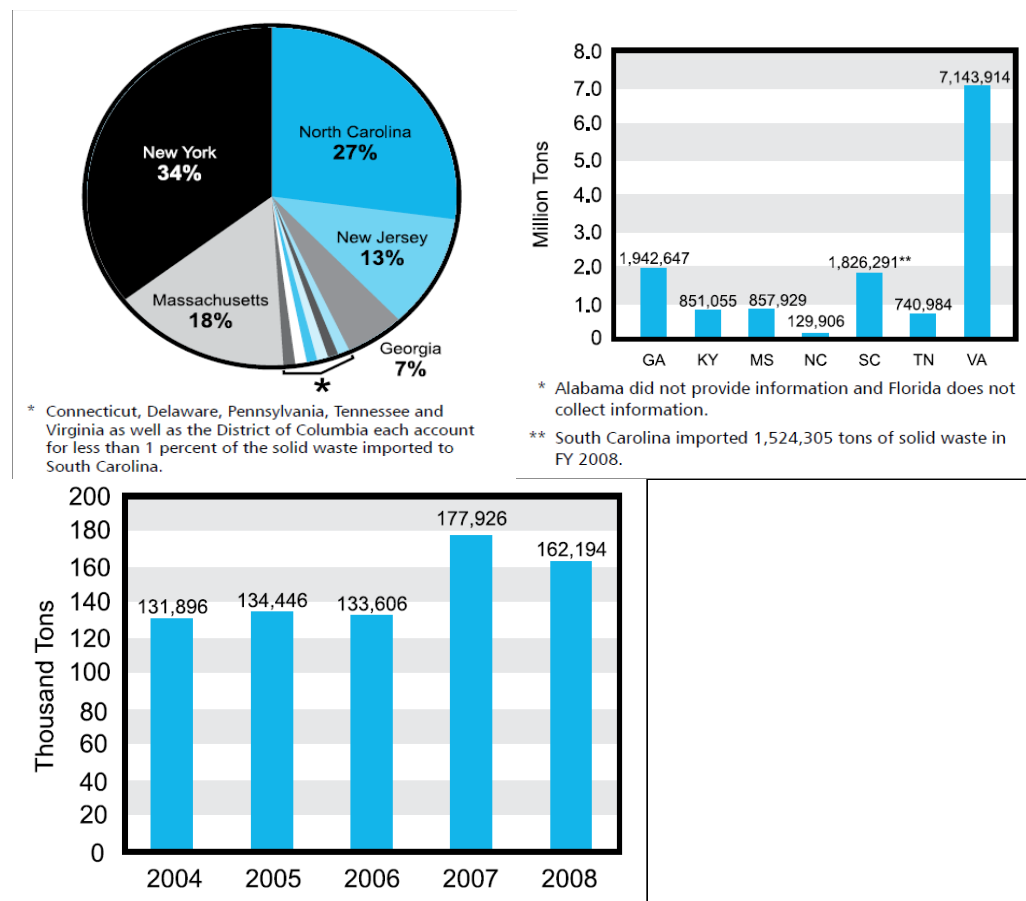


Figure 1: Import and export of waste in South Carolina in 2008 (top left and bottom) and Southeastern state (top right) in 2007 (DHEC, 2009). See discussion for more detail.

Countries and states in the US have adopted laws and goals to divert biodegradable waste from landfills to sustainable facilities that can compost the organic matter to be used in more practical applications.

### Green Job Opportunities

In addition to the many benefits listed above, creating a new division of waste management that recycles food waste and yard waste will open up many green job opportunities and reduce unemployment. Someone will need to pick up the waste from the curb and drive it to the composting facilities. There will need to be operators at the facility itself, making sure the machines are running properly and responsible for moving the new organic materials to the

correct stations. The finished compost will need to be tested by an expert for the presence of any contaminants and pathogens and quality control personnel. Once the material is bought, then it creates additional jobs in agriculture and erosion control. One can see how this would stimulate the economy.

## Residential Food Waste Collection and Composting Worldwide

### *Canada*

Canada has been successful with the implementation of the Green Bin Program throughout much of the province of Ontario launched in 2002 in the city of Toronto. They had a residential waste diversion rate of 44% in 2008 and diverted 363,891 tones or 46% in 2009 Toronto alone. Their goal is to achieve 70% solid waste diversion by 2010. This has changed the solid waste management fee to fund the solid waste programs and services and for future expansion of these services with \$30 million coming from residential sector and \$24 million from multi-family residential sector. Residents are charged a solid waste management fee for curbside garbage bin service on their utility bills, rather than as a part of residential property tax, and this fee is based on the garbage bin size (Volume-based) multiplied by a daily rate. If you reduce your garbage bin size, then your fee will go down. They compare their program to those in Vancouver, San Francisco, Los Angeles, San Jose and Seattle. They also are preparing for illegal dumping by hiring additional law enforcement to catch those that break this law (City of Toronto, Jan. 2010).

Solid Waste Management Residential Curb-side Fees (Normal Year - 365 days)		
Garbage Bin Size	Daily Rate	Daily Rebate
Small	\$0.545205479 (\$199 per year)	\$0.572602740 (\$209 per year)
Medium	\$0.679452055 (\$248 per year)	
Large	\$0.936986301 (\$342 per year)	
X-Large	\$1.093150685 (\$399 per year)	

Figure 2: Toronto's solid waste management residential curb-side fees. The rebate refers to residents paying the city back for green bin program and other solid waste services. Residents have some control, if they reduce the bin size they pay less/ yr (City of Toronto, 2010). The \$209 fee per year per household is distributed as follows: \$46 for organics, \$26 for recycling, \$27 for city services for collection of liter, etc, and \$110 for waste collection, transfer and disposal (Rathbone, 2007).

York region has made remarkable progress from 2004 to 2008, with diversion rates of 24% and 53%, respectively. The York region has nine municipalities that pick the green bin contents to taken to the Waste Management Centre in East Gwillimbury or to a private transfer station and then distributed to several licensed contracted compost facilities (York Region).

They collect materials that can't be composted at home such as pet waste, meat, fish, and diapers. The township provides residents with curbside pickup service with a small kitchen container and a green bin for collection that is designed to keep out animals. It is mandatory in Ontario for resident to comply with green bin program. The green bin has a latch and they also give residents suggestion on how to further secure organic waste from raccoons and dogs such as using bungee cord. In addition, it is picked up once a week to keep odors down and it should not smell any worse than ones trash before the green bin program as long as it is rinsed regularly just



as residents did with their garbage bin before. It is sanitary and safe; residents are simply doing what they did before only putting their organics in a separate bin. (City of Toronto, Jan. 2010)

Other countries that are known to have compost facilities are Hawaii, UK, countries in Europe like Germany, Holland, Switzerland, and New Zealand.

### Recycling Food Waste Efforts in the US

Although the U.S is well behind Europe and Canada in residential food waste collections, America is showing significant growth in this area. As of 2009 more than 90 communities across the nation have begun to offer residential food waste collections. According to a nationwide survey this almost doubled the 42 programs available in 2007 (Yepsen, Goldstein, 2007). A complete table of the 42 programs available are comprised in a table on the final page.

Across the nation pilot programs are being introduced to determine whether or not food waste collection is feasible for each area. California and Washington even have cities where residential organics collection is mandatory; these being San Francisco and Seattle (Yepsen, 2009). Our Tri-State area is also beginning to contribute to the effort. These states include Massachusetts, Pennsylvania, and New York.

#### *New York*

New York, like New Jersey, does a majority of their food waste recycling through restaurants and food markets. The Lower East Ecology Center (LEEC) started a community compost program in 1990, accepting residential food waste at its community garden on East 7th Street. Since 1994, LEEC has also collected residential food waste at the Union Square Greenmarket four days a week (Yepsen, 2009). In 2009, they were able to collect 312 tons of food waste from these two locations. A majority of the waste was from vegetables and was transported to East River Park. After composting the new soil is sold at Greenmarket as either compost or potting soil.

#### *Pennsylvania*

Has over 26 locations where food waste is accepted for composting. Among these facilities is Penn State University where over 820 households have curbside organics pickup.

#### *Massachusetts*

The state of Massachusetts has two communities with very different approaches to curbside food waste pickup. In the town of Hamilton a pilot program was introduced in 2009 for residents. The company Norseman provided residents with curbside carts along with kitchen collectors. New England Solid Waste collected the organic materials, and Brick Ends Farm composts it. According to the data collected, the average amount of food waste put out each week was 10 pounds. The Hamilton Recycling Committee calculated that with 500 participants, weekly costs for organic waste collection would be \$6.25/month (Yepsen, 2009). If the program is instituted, the town of Wenham will also participate and 3700 households will be provided curb side food waste pick up.

The towns of Northampton and Florence have a different approach to curb side food waste pickup. The Pedal People Cooperative, Inc. manages costumer waste by the use of man power.

They offer garbage, recycling and organics collection. In business since 2002, Pedal People uses bicycles with trailers to collect waste from businesses and residences, and offers rates that are competitive with conventional private haulers (Yepsen, 2009). The organics collection began in 2007, and according to a founding member of Pedal People 385 households participate in the program.

(Matt Wysokinski)

#### States in the US that are recycling organics:

##### *California*

California is now required by law to divert 75% of this waste to achieve zero waste by 2020. Since zero waste programs have been becoming wide spread, eventually the most progressive states will have to set an example. Recology has two operations where the compost is brought after curbside pickup (Recology). South Valley Organics, Inc. collects food scraps and green waste



such as yard trimmings and paper napkins for residents in the South Bay area and receives and processes 20,000 tons/year of feedstock from the city of Gilroy and Morgan Hill. They implement the "Ag-Bag" composting system, which controls run-off and odor emissions. This involves condensing the material by grinding, putting it in an "Ag-Bag", aeration with high volume blowers for 60 days, and finally removal from the bag to be exposed to air in a windrow for another 30 days. It is analyzed routinely for nutrient, metal and pathogen content to guarantee its quality. After this 90 day process, it is sold (South Valley). The other operation of Recology is Jepson Prairie Organics in Vacaville, CA, which collects waste in the Bay area. They take wastes from big and small institutions such as restaurants, hotels, markets, and coffee shops and even from residents creating a very rich black soil. The organic farming industry in the area purchase the rich soil and sell the crops back to markets. It is also sold to vineyards, industries that bag and sell it to consumers like us, landscapers, and erosion projects (Jepson Prairie).

Recology provides three bins for residents, one each for recyclables, landfill garbage, and compost. They charge a flat rate of \$27.55/month for the 32 gallon garbage cart to be picked up weekly. They give economic incentive to reduce the amount waste going into the garbage cart by utilizing the recyclable and compost bins free of charge. Once customers produce only 20 gallons of landfill garbage bin, they will save 23% off the 32 gallon price or pay only \$21.21/month for the smaller bin which now meets their needs. They even offer lower rates for low-income households that qualify of \$20.66 and \$15.61 per month for the 32 and 20 gallon bin (Recology).

##### *Washington*

The state of Washington has emerged as one of the nations leading states in the recycling of organic materials. The states Organic Materials Initiative is a 30 year program started in 2005, and will significantly reduce the amount of organics that end up in a landfill. A major concept that New Jersey can obtain through Washington's Initiative is the role of government in the

success of the program. Their governments lead by example, and establish programs and clear guidelines on food waste prevention at residential, commercial, and institutional levels. They also identify incentives to increase organic management programs at state and local government agencies, and institutions.

To measure the success of the Organic Materials Initiative, milestones were implemented and reviewed over a period of five years. These milestones include programs to expand and increase organics recovery programs in residential and commercial sectors, and also recognize that capacity for processing organics needs to grow with increased recovery. These programs are also designed with the fact that the opportunities available between the rural and urban areas of the state differ. These programs include:

- Incorporate Organics Materials Initiative goals into local-jurisdiction solid waste management plans.
- Assess yard debris and food scrap recycling infrastructure in large municipalities.
- Provide “tools” (such as education materials and technical assistance) to coordinators of home compost programs.
- Identify incentives for local governments to increase organics collection and processing capacity.
- Promote the purchase of recycled organic products through “healthy soil” education, to create stable markets for recycled organics.
- Remove regulatory barriers to promote increased organics processing capacity.
- Support new processing technologies that provide a variety of organics recycling opportunities.
- Expand or implement home composting programs in every county.
- Work with local haulers and transfer stations to provide organics collection and diversion options.
- Advertise success of model residential and commercial organics recovery projects.

(Chapter 70.95 RCW)

One of the pioneers in this diversion of food waste from the landfill to a recycling center is King County in the state of Washington. King County is located on the west coast of Washington State, and it covers 2,134 square miles. At this size it doubles the average size of a county in the country. With more than 1.9 million people, it also ranks as the 14th most populous county in the nation (Yepsen, Goldstein, 2007). According to Josh Marx, Senior Planner with the King County Solid Waste Division. Food and soiled paper account for nearly 30 percent of the single-family waste stream in the county, making organics collection a priority.

In 2002 Kings County started a pilot program for organics recycling. Since then the program has been on the rise, and as of 2009 their food scrap recycling services are currently available to 98% of single family residents who have curbside garbage service.

One of the last cities to join this movement was Seattle, and since then they have seen a remarkable increase in food waste recycling. In 2009 Seattle residents were able to collect 89,000 tons of organic waste and convert it into compost. Over 26,000 tons was collected from the curb side pickup program and reused in local gardens instead of going to landfill. With this new program in place there was an improvement from 2008 in which 20% of the entire 400,000 tons collected was sent to landfill was food waste (WMW).

Residents have two options for recycling their waste. First residents can sign up for a curbside service to haul away food and yard waste. Food scrap recycling service is currently available to 98% of single family residents who have curbside garbage service. The service is not only convenient but also very affordable. In Seattle upon reregistering for the service an option for three different size waste containers is available. According to the Seattle public utilities the prices are as follows (2010).

Monthly Residential Food and Yard Waste Can Rates - Effective January 1, 2010:

- 13-gallon (mini-can) at \$4.10/month
- 32-gallon at \$6.10/month
- 96-gallon at \$7.85/month

Additional yard waste will cost \$3.90 per bundle or extra unit.

The second option is for residents to dispose of their waste on their own to transfer stations. Transfer stations are facilities where garbage hauling companies, businesses and King County residents can bring their waste. Another option is to bring your organic food waste to a Drop Box. These Drop Box facilities are smaller and the waste is consolidated, then transported for disposal.

One of the concerns in the creation of such a program for New Jersey is can it be successful. Success is measured in many ways, but at the top of the list is profitability, and participation of residents. To bring light to this question we can look at the success of the city of Seattle. Bret Stav, Senior Planning & Development Specialist for Seattle Public Utilities, When asked about the keys to a successful residential organics collection program, Stav lists education, convenience and purpose as the three main ingredients for success. “We would have more participation if we collected weekly (convenience); our customers tell us that our educational pieces are helpful for learning what can be placed in the cart; and for purpose, there needs to be a clear understanding of why they should be engaging in the behavior, such as putting less in the landfill, saving money, fighting global warming, etc.(Yepsen, Goldstein,2007).”



## **The Service Project: Bill to Legislation**

Present a Bill to Legislation, General Assembly, which states the need for laws that diverts organic waste from landfills to compost facilities using current laws and operations in other states and countries as models. Currently, Central Jersey Waste and Waste Management provide these services to only big institutions like restaurants, hotels and stores. Waste Management in NJ recognizes that “one-eighth of all solid waste generated in the US is from food scraps” and is open to providing food and yard waste curbside recycling services. Waste haulers are awaiting permission from individual townships and an increase in demand from homeowners. In addition, lack of legislation on waste diversion that forces homeowners to recycle organic matter makes it difficult for widespread implementation of these programs.

### **Editorials**

Matthew Wysokinski

Editorial

Sent to: Asbury Park Press via email submission on 11/1/10

## **Composting legislation can save Jersey billions**

As if New Jersey did not have enough problems, landfills are reaching maximum capacity at an alarming rate. When will New Jersey finally implement legislation for a more sustainable method of waste management? California is already required by law to divert 75% of its waste to more sustainable facilities, and have a plan to achieve a goal of zero waste by 2020. The state of Washington has a similar Organic Materials Initiative with set goals to be accomplished by 2030. Now is the time for New Jersey to adopt a similar program before it is too late.

With the average person producing 4.5 pounds of waste per day, we can not continue using current methods of waste management much longer. Constantly adding biodegradable waste into landfills is not only contributing to global warming, but is costing the state billions of dollars to maintain, cap, and relocate.

New sustainable techniques such as composting food waste are already in effect in other states. Considering over 1/8 of the waste produced by the average person is food scraps, a curbside food waste service is an effective way to divert a significant amount of waste to be recycled. Waste Management one of the leading waste disposal companies in the state already has the techniques to pick up residential food waste, and is doing so across the country. Diverting food from restaurants and schools is not enough, legislation needs to be passed so companies are required to offer a biodegradable waste pickup service.

Forget about building wind turbines out in the atlantic. We need a proven solution to set New Jersey on the right path. New innovative waste disposal techniques have more upside then people understand.

Matt Wysokinski

Middletown

Ashley Jennings  
Editorial  
Sent to: The Star-Ledger  
Recycle Food Waste in NJ

Many developed countries including Canada, UK, and several in Europe have passed mandatory solid waste diversion laws that divert organic matter from landfills where it can be recycled and reused. Even California and Washington has mandated that food waste and yard waste be separated from landfill garbage and curbside pickup services of these recyclables are widespread and very successful. Why is it that NJ still dumps this valuable compost into landfills?

Instead of turning food scraps into good agricultural soils and for use in biofuel production, NJ exports the excess waste to other states such as South Carolina landfills according to Department of Health and Environmental Control in SC. NJ and other states need to face the fact that there is limited space for landfills.

Landfills attract pests and pathogens, have a foul odor, are not cost-effective, produce continuous greenhouse gases, contaminate groundwater, and are a waste of potential quality soils. The list could go on. Compost provides beneficial bacteria which continually supply bioavailable micronutrients and macronutrients for healthy plant growth and is much more sanitary. Compost is even used for erosion control by companies such as Filtrexx International. There are many workshops available that make it easy to learn how to compost and it can be done anywhere even for those who live in the city, in fact, the rise of city farming is an example of that.

For those who don't have the yard space to compost and want to be environmentally friendly, there should be curbside services available to residents just like other states that pick up food waste just like plastic, glass, and paper.

Starting a new division of waste management that recycles food waste and yard waste will open up many green job opportunities and work toward reducing unemployment. For instance, among the new jobs will be: new drivers that pick up the organic once a week, mechanical operators at the composting facilities to load and unload the organics, scientists that test the quality of the compost as well as quality control personnel, and additional jobs in agriculture and soil structure. One can see how this would stimulate the economy.

Currently, Central Jersey Waste and Waste Management provide these services only to big institutions like restaurants, hotels and stores. Waste Management in NJ recognizes that "one-eighth of all solid waste generated in the US is from food scraps" and is open to providing food and yard waste curbside recycling services.

Waste haulers are awaiting permission from individual townships and an increase in demand from homeowners. In addition, lack of legislation on waste diversion that forces homeowners to recycle organic matter makes it difficult for widespread implementation of these programs. Until the public is aware of the inefficiency and unsustainable practice of dumping in landfills, we will continue to pollute the air we breathe and the water we drink. We will waste valuable land and resources. It's time to make

a commitment to the environment and push for legislation on waste diversion that will work toward zero waste.

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New Jersey General Assembly  
State House  
P.O. Box 098  
Trenton, NJ 08625-0098

Dear Assembly,

As you know, New Jersey is nationally recognized for the states commitment to reduce its carbon footprint. The state has taken a stand against global warming, and has a variety of programs in place to reduce environmental impacts. Now that New Jersey is in the “going green” era, it is time to take our efforts past the recycling of bottles, cans, and paper. In these hard economic times, we need to devise a plan that will increase the life of our present landfills, while saving the state valuable funds, and creating new job opportunities.

With the average person producing 4.5 pounds of waste per day, New Jersey can no longer continue using current methods of waste management. Constantly adding biodegradable waste to landfills is not only contributing to global warming, but it is costing New Jersey billions of dollars to maintain, cap, and relocate. Landfills are not economically feasible and are a waste of valuable renewable resources. The composting of residential organic wastes is a safe and effective solution and is becoming increasingly popular among states around the country.

To assist New Jersey in reaching that next level, I have attached a proposed bill that will not only increase the amount that New Jersey recycles, but also what the state is able to recycle. Implementing a law that would inevitably require waste management companies to offer a curbside organics pick up can put this great state at the top in the battle against the overuse of landfills. This will be a new age where New Jersey residents will be able to contribute to the efforts in reducing greenhouse gas emissions.

My associate and I would appreciate the opportunity to further discuss the bill with you in person. Within the next ten days, I will contact you to confirm that you have received a copy of the bill. In the meantime feel free to contact us with any questions, comments, or concerns. You can reach me by email at [mwiz@eden.rutgers.edu](mailto:mwiz@eden.rutgers.edu). We are truly grateful for your time and consideration.

Sincerely,

Matthew Wysokinski

## Appendices

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Ashley Jennings

(Matt Wysokinski)

### THE GENERAL ASSEMBLY OF NEW JERSEY

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# SENATE BILL

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INTRODUCED BY ASHLEY JENNINGS AND MATT WYSOKINSKI  
RUTGERS UNIVERSITY, THE STATE UNIVERSITY OF NEW JERSEY  
DECEMBER 1, 2010

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## AN ACT

Diversion of food and yard waste from landfills to compost facilities for a sustainable, cost effective means to      conserve land and improve air and water quality.

The New Jersey General Assembly hereby enacts as follows:

### Section 1.

This act shall be known and may be cited as the “New Jersey Integrated Waste Management Act”.

### Section 2.

This act is designed to recover, recycle, and reuse valuable renewable resources for application in agriculture and erosion control.

- Providing widespread curbside services that pick-up residential and commercial organic matter.
- Implementation of educational programs to involve residents in efforts to achieve diversion goals.
- Offer incentives to reduce the volume of garbage by diverting food and yard waste to a separate bin for organics.



### Section 3.

Require solid waste management companies to extend curbside service to residents, not only large institutions. This should mandate and provide an additional organic waste bin with instructions to residents. Establish penalties and enforcement for illegal dumping of organic waste or refusal to use green bin.

### Section 4.

Violators are fined \$100-\$500 for first offense and up to \$1000 for second offense.

### Section 5.

Provide a green bin and a weekly curbside service to residents that are billed for curbside waste management service.

### Section 6.

This act mandates that 50% organics be diverted from landfills to composting facilities by 2020 and an increase of the diversion rate to 75% by 2025.

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