Tools for Evaluating a Food Waste Diversion Program

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EPA Tools

Calculators to determine costs and environmental benefits

- Food Waste Calculator

  http://www.epa.gov/epawaste/conserve/materials/organics/food/tools/index.htm

- Waste Reduction Model

  http://www.epa.gov/WARM

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Preparing to Use Tools

- Collect as much data as possible on how much food you purchase and how much food is disposed.
- Other useful information
  - Current hauling costs
  - Fees for bin, dumpster rentals or purchase

Food Waste Calculator

Evaluates Costs of Alternatives to Food Waste Disposal

- Examines all levels of the hierarchy
- Allows users to select type of institution
  - Grocery store, restaurant, university, hospital, schools, prison, other cafeteria
- Default assumptions available for some data
- Includes capital and operating and maintenance costs

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Inputs page

Food Waste Management Inputs	
Source Reduction	
What type of facility are you?	Grocery Store
How many pounds of non-perishable food waste do you generate per week?	2,000
What percentage of non-perishable food waste are you willing to source reduce?	3%
How many pounds of pre-consumer prepared/whole food waste do you generate per week?	2,000
What percentage of pre-consumer prepared/whole food waste are you willing to source reduce?	3%
How many pounds of pre-consumer trim waste do you generate per week?	1,000
What percentage of pre-consumer trim waste are you willing to source reduce?	3%
How many pounds of post-consumer plate waste do you generate per week?	1,000
What percentage of post-consumer plate waste are you willing to source reduce?	3%
How much yellow grease do you generate per week?	200
What is your average purchasing cost per pound for non-perishables?	$1.17
What is your average purchasing cost per pound for pre-consumer prepared/whole foods?	$1.17
What is your average purchasing cost per pound for foods that comprise trim and plate waste ?	$1.17
Non-Perishable Food	
Does your facility have access to a local food bank that will accept non-perishable foods?	Yes
Does your non-perishable food waste meet the requirements for donation to your local food bank?	Yes
Does the food bank offer a regular pick-up service that your facility is eligible for?	Yes
Is there a fee for this pick-up?	Yes
How is this fee calculated?	By Weight
How much does the pickup cost per ton?	$10
If applicable, enter the estimated value of your annual tax deduction for donation.	$0

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Inputs page (continued)

Pre-Consumer Prepared/Whole Foods, Trim Waste, and Plate Waste	
Food Rescue	
Does your facility have access to a local food rescue service that accepts prepared meals?	Yes
Are you willing to divert your pre-consumer prepared/whole food waste to a food rescue organization?	Yes
Do your pre-consumer prepared/whole foods and food management procedures meet the requirements for donation to a food rescue organization?	Yes
Does the food rescue service offer a regular pick-up service that your facility is eligible for?	Yes
Is there a fee for the food rescue pick-up?	Yes
If applicable, enter the estimated value of your annual tax deduction for donation.	$0
Feeding Animals	
Do you have access to a local farm that accepts food scraps to feed animals?	No
Composting	
Does your facility have the ability to compost outdoors at your site?	No
Are you willing to purchase and operate an in-vessel composter at your facility?	No
Do you have access to off-site composting?	Yes
Do your food scraps and storage capabilities meet the requirements of your local off-site composter?	Yes
Is pick-up available for off-site composting in your area?	Yes
Is there a fee for this organic waste pick-up?	Yes
How much, if anything, are you paid per pound, for compost you are able to sell?	$0.00
Of the composting methods available, select the one that you would you prefer to use at your facility? Choose a blank space if you prefer not to compost.	Off-Site

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Functionality

Composting	
Does your facility have the ability to compost outdoors at your site?	No
Are you willing to purchase and operate an in-vessel composter at your facility?	No
Do you have access to off-site composting?	Yes
Do your food scraps and storage capabilities meet the requirements of your local off-site composter?	Yes
Is pick-up available for off-site composting in your area?	Yes
Is there a fee for this organic waste pick-up?	Yes
How much, if anything, are you paid per pound, for compost you are able to sell?	$0.00
Of the composting methods available, select the one that you would you prefer to use at your facility? Choose a blank space if you prefer not to compost.	Off-Site

Are you willing to purchase and operate an in-vessel composter at your facility?	Yes
Will your business be required to pay for the capital costs associated with in-vessel composting?	Yes
Will your business be required to pay for the energy costs associated with in-vessel composting?	Yes
Will your business be required to pay for the labor costs associated with in-vessel composting?	Yes
Will you finance the initial cost of the composter or will you buy it outright? Based on available data, a composter costs $39,000.	Finance
How much will you pay for a down payment?	
What will your interest rate be?	
How many years will the term of the loan be for?	

Results

Cost Calculator Tab

- 1-, 3-, 6-, & 10- year costs

Cost Graph Tab

- Graphical representation of 1, 3, 6, and 10 year costs

Benefits Tab

- Particulates, Toxics, Carcinogens, Eutrophication, Acidification, Ecosystem Toxicity

Results Page

Food Waste Management Calculator Results

Based on your selections and inputs, the most environmentally-friendly and cost-effective food waste management scenario for you to employ at your facility is as follows:

Food Waste Type	Food Waste Diversion Strategy
Non-Perishable Food Waste	Food Bank
Pre-Consumer Prepared/Whole Food Waste	Food Rescue
Pre-Consumer Trim Waste	Off-Site Compost
Post-Consumer Plate Waste	Off-Site Compost
Yellow Grease	Disposal

Congratulations! Based on your inputs, you would source reduce 3,120 pounds of non-perishables, 3,120 pounds of pre-consumer prepared/whole foods, 1,560 pounds of pre-consumer trim waste, and 1,560 pounds of post-consumer plate waste for a total of 9,360 pounds annually.

You would also compost 100,880 pounds per year.

If you employ the management methods listed above, your facility would save roughly $17,600 after 1 year and $178,800 after 10 years.

Annually, based the quantity of food waste composted, your facility could potentially reduce the following:

-Particulates equivalent to reducing 66 pounds of PM2.5, which has been linked to respiratory and heart disease. Reducing this level of PM2.5 emissions is equivalent to removing 2,253 cars off the road for one year.

-Toxics equivalent to 37,280 pounds of toluene, a toxic chemical that has been found to have acute, long-term, and developmental effects on human heath.

-Carcinogens equivalent to 15 pounds of a benzene, a toxic chemical proven to cause leukemia in humans.

-Eutrophication equivalent to 262 pounds of nitrogen, commonly used as a nutrient in fertilizers.

-Acidification equivalent to 293 pounds of sulfur dioxide (SO2) per year. SO2 has been linked to acid rain, which damages trees, crops, historic buildings, and monuments; and makes soils, lakes, and streams acidic. This level of SO2 emissions is equal to the amount of SO2 generated during the production of 7,259 Kilowatt-Hours of electricity at the most polluting power plant (in terms of SO2) in the US.

-Ecosystems toxicity equivalent to 227 pounds of 2,4-D, a commonly used agricultural and residential pesticide.

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Waste Reduction Model (WARM)

- Estimates the climate or energy impacts of waste management
- Can be used for decision making or estimating benefits of an existing program

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WARM Excel Model

1. **Describe the baseline generation and management for the MSW materials listed below. If the material is not generated in your community or you do not want to analyze it, leave it blank or enter 0. Make sure that the total quantity generated equals the total quantity managed.**

2. **Describe the alternative management scenario for the MSW materials generated in the baseline. Any decrease in generation should be entered in the Source Reduction column. Any increase in generation should be entered in the Source Reduction column as a negative value. (Make sure that the total quantity generated equals the total quantity managed.)**

Material	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted	Tons Generated	Tons Source Reduced	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted
Aluminum Cans				NA	0.0					NA
Steel Cans				NA	0.0					NA
Copper Wire				NA	0.0					NA
Glass				NA	0.0					NA
HDPE				NA	0.0					NA
LDPE				NA	0.0					NA
PET				NA	0.0					NA
Corrugated Cardboard				NA	0.0					NA
Magazines/Third-class Mail				NA	0.0					NA
Newspaper				NA	0.0					NA
Office Paper				NA	0.0					NA
Phonebooks				NA	0.0					NA
Textbooks				NA	0.0					NA
Dimensional Lumber				NA	0.0					NA
Medium-density Fiberboard				NA	0.0					NA
Food Scraps	NA				0.0		NA			
Yard Trimmings	NA				0.0		NA			
Grass	NA				0.0		NA			
Leaves	NA				0.0		NA			
Branches	NA				0.0		NA			
Mixed Paper (general)				NA	0.0	NA				NA
Mixed Paper (primarily residential)				NA	0.0	NA				NA
Mixed Paper (primarily from offices)				NA	0.0	NA				NA
Mixed Metals				NA	0.0	NA				NA
Mixed Plastics				NA	0.0	NA				NA
Mixed Recyclables				NA	0.0	NA				NA
Mixed Organics	NA				0.0	NA	NA			
Mixed MSW	NA			NA	0.0	NA	NA			NA
Carpet				NA	0.0					NA
Personal Computers				NA	0.0					NA
Clay Bricks	NA		NA	NA	0.0		NA		NA	NA
Concrete[1]			NA	NA	0.0	NA			NA	NA
Fly Ash[2]			NA	NA	0.0	NA			NA	NA
Tires[3]				NA	0.0					NA

Please enter data in short tons (1 short ton = 2,000 lbs.)

Please refer to the User's Guide if you need assistance completing this table.

[1] Recycled concrete used as aggregate in the production of new concrete

[2] Recycled fly ash is utilized to displace Portland cement in concrete production.

[3] Recycling tires is defined in this analysis as retreading and does not include other recycling activities (i.e. crumb rubber applications).

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Entering Data

If you are managing 10 tons of food waste.

Material	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted	Tons Generated	Tons Source Reduced	Tons Recycled	Tons Landfilled	Tons Combusted	Tons Composted
Aluminum Cans				NA	0.0					NA
Steel Cans				NA	0.0					NA
Copper Wire				NA	0.0					NA
Glass				NA	0.0					NA
HDPE				NA	0.0					NA
LDPE				NA	0.0					NA
PET				NA	0.0					NA
Corrugated Cardboard				NA	0.0					NA
Magazines/Third-class Mail				NA	0.0					NA
Newspaper				NA	0.0					NA
Office Paper				NA	0.0					NA
Phonebooks				NA	0.0					NA
Textbooks				NA	0.0					NA
Dimensional Lumber				NA	0.0					NA
Medium-density Fiberboard				NA	0.0					NA
Food Scraps	NA	10.0			10.0		NA			10.0
Yard Trimmings	NA				0.0		NA			

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WARM Results

WARM Summary close or Esc Key

Energy Analysis — Summary Report

(Version 10, 11/09)

Analysis of GHG Emissions from Waste Management

GHG Emissions from Baseline Waste Management Scenario (MTCO2E):	7
GHG Emissions from Alternative Waste Management Scenario (MTCO2E):	-2
Total Change in GHG Emissions: (MTCO2E):	**-9**

	Baseline Scenario					Alternative Scenario						
Material	**Tons Recycled**	**Tons Landfilled**	**Tons Combusted**	**Tons Composted**	**Total MTCO2E**	**Tons Source Reduced**	**Tons Recycled**	**Tons Landfilled**	**Tons Combusted**	**Tons Composted**	**Total MTCO2E**	**Change (Alt - Base) MTCO2E**
Food Scraps	N/A	10	0	0	7	0	N/A	0	0	10	-2	-9

Note: A negative value indicates an emission reduction; a positive value indicates an emission increase.
a) For an explanation of the methodology used to develop emission factors, see EPA report: Greenhouse Gas Emissions from Management of Selected Materials in Municipal Solid Waste (EPA530-R-98-013) — available on the Internet at http://www.epa.gov/climatechange/wycd/waste/reports.html Please note that some of the emission factors used to generate these results do not

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