

POST CONSUMER FOOD WASTE COMPOSTING

General Motors – Milford Proving Ground Case Study

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GENERAL MOTORS

BACKGROUND



- Est. 1924
- 3,899 acres
- > 100 buildings
- 5,000 employees
- One cafeteria serving approx. 650 people / day

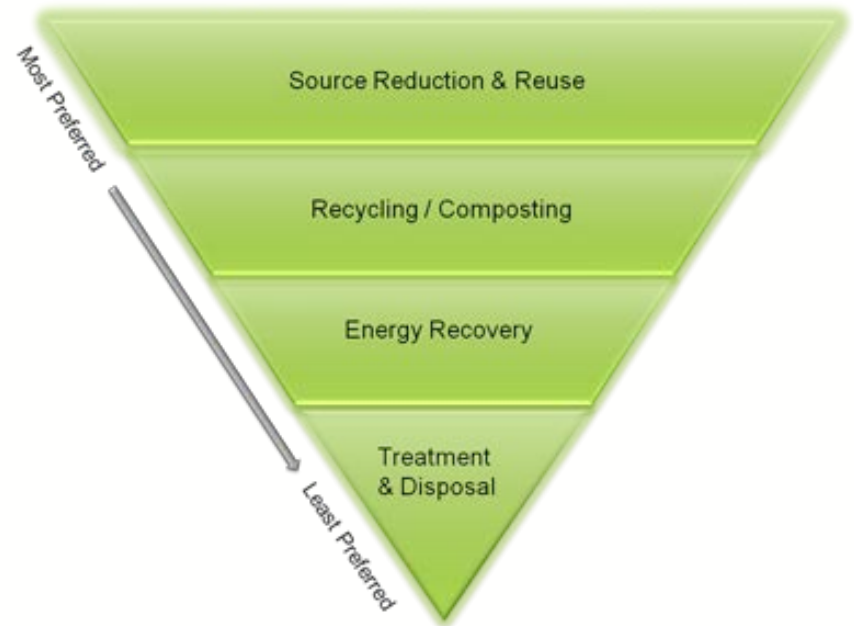
CHALLENGE

Recover organics from the landfilled waste stream for composting without dramatically increasing operational costs.

GM-MPG is one of nine GMNA facilities which participates in compostable waste collection. The size and scope of the MPG program, however, made implementation an unusual challenge.



Waste Management Hierarchy



KEY CONTACTS

Continental – Cafeteria vendor

Caravan / SBM – Janitorial services

BBC Distributing – Compostable liner distributor

Tuthill Farms and Composting – Industrial composting facility

Hammond Farms / Metro Sanitation - Transportation



COMPOSTABLE FOOD SERVICE WARE

Worked closely with Continental Services to establish a program that used compostable food service ware.

Each disposable item was identified and scrutinized

- Failure to find a compostable alternative = more education required down the road = increased chance of contamination
- Verified that products would be accepted at Tuthill Farms
- Trialed new products to ensure that functionality was maintained

MPG had already phased out Styrofoam food service ware, therefore not a significant price increase to switch to compostable products



COMPOSTABLE FOOD SERVICE WARE



COMPOSTABLE FOOD SERVICE WARE



COMPOSTABLE FOOD SERVICE WARE



DETAILS MATTER



EDUCATION

Multiple tactics used to reach 5,000 employees as well as visitors-

- flyers
- signs
- table tents
- newsletter articles
- videos
- group meetings
- lunch events
- color coordinated waste containers
- waste station monitoring (post launch)



GENERAL MOTORS
MILFORD PROVING GROUND

GM MPG Cafeteria Composting

On Monday May 2nd the GM MPG cafeteria will begin collecting compostable food waste in an effort to reduce the amount of waste that our facility sends to landfill. General Motors will join companies such as Google, the University of Michigan and Zingerman's in sending their compostable waste to Tutill Farms in South Lyon, MI.

Composting our cafeteria waste will reduce harmful greenhouse gas emissions, divert waste from overcrowded landfills and recycle vital nutrients back into the environment. It will also bring us closer to our facility landfill-free goal.

We ask that the MPG cafeteria patrons please adhere to the signage posted regarding the proper sorting of their food waste. Cross-contamination of our waste streams must be prevented in order for the program to be successful!

- **Compostable items:** food or disposable food service items certified to compost within a short period of time
- **Recyclable items:** clean plastic materials that can be recycled into future products
- **Landfill items:** anything that cannot be composted or recycled (i.e. potato chip bags, yogurt lids)

✓ All food waste
✓ Certified compostable products (provided by MPG Cafe)
✓ Napkins
✓ Wooden toothpicks

↓ COMPOST

✓ Clean plastic bottles / containers

↓ RECYCLE

✓ Starbucks coffee cups and sleeves
✓ Pre-packaged food containers
✓ Water cooler cups

↓ LANDFILL

Questions can be directed to the MPG Environmental Group

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FOOD WASTE SEGREGATION IN ACTION



SIX WASTE STREAMS

Plastic

Cardboard

Landfill

Glass

Metal

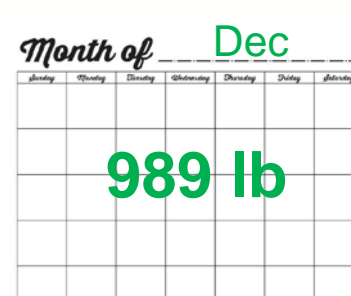
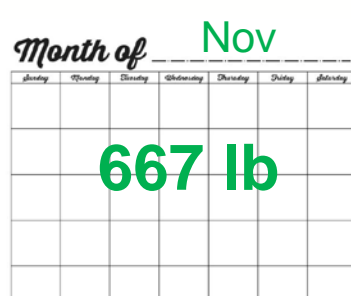
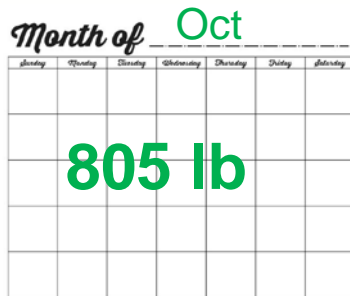
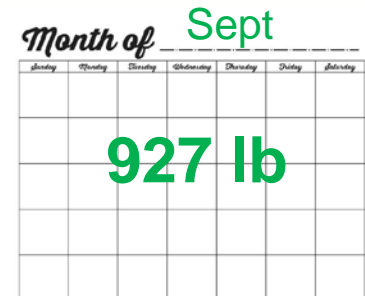
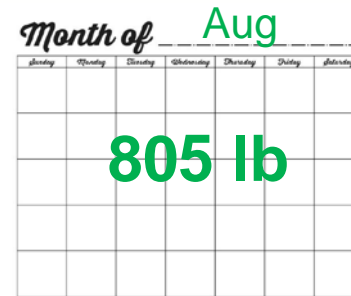
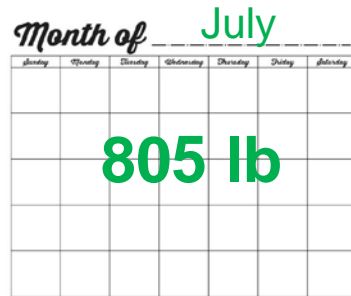
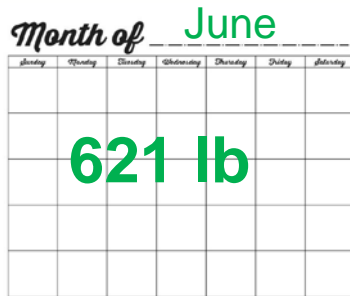
Compostable Waste



METRICS

METRICS (2016)

Launched program in May 2016, filling two 64-gallon carts each working day.



2016 Total Composted Waste = 5,619 lb

METRICS – 2016 GHG REDUCTION

Exhibit 10: Net Emissions for Food Waste and Mixed Organics under Each Materials Management Option (MTCO2E/Short Ton)

Material	Net Source Reduction Emissions	Net Recycling Emissions	Net Composting Emissions	Net Combustion Emissions	Net Landfilling Emissions
Food Waste	-3.66	NA	-0.15	-0.12	0.71
Food Waste (non-meat)	-0.76	NA	-0.15	-0.12	0.71
Food Waste (meat only)	-15.10	NA	-0.15	-0.12	0.71
Beef	-30.05	NA	-0.15	-0.12	0.71
Poultry	-2.47	NA	-0.15	-0.12	0.71
Grains	-0.62	NA	-0.15	-0.12	0.71
Bread	-0.67	NA	-0.15	-0.12	0.71
Fruits and Vegetables	-0.44	NA	-0.15	-0.12	0.71
Dairy Products	-1.74	NA	-0.15	-0.12	0.71
Mixed Organics	NA	NA	-0.14	-0.14	0.29

Note: Negative values denote net GHG emission reductions or carbon storage from a materials management practice.
NA = Not applicable.

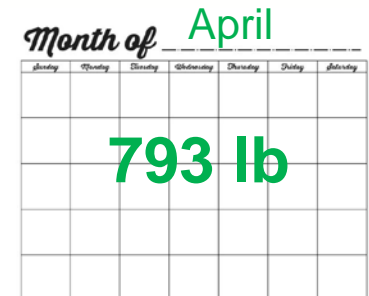
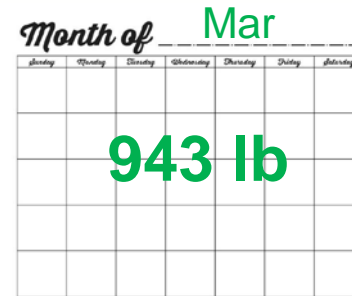
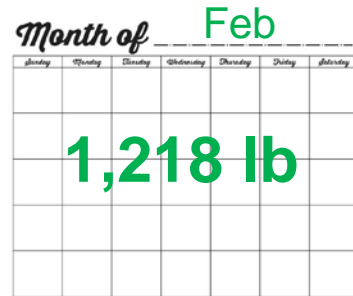
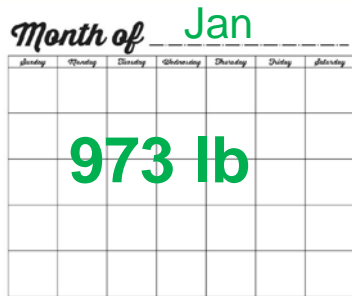
https://www3.epa.gov/warm/pdfs/Food_Waste.pdf

2.81 short tons of composted waste = 2,663 lb CO₂e reduction

Industrial Designation or Common Name (years)	Chemical Formula	Lifetime (years)	Radiative Efficiency (W m ⁻² ppb ⁻¹)	Global Warming Potential for Given Time Horizon			
				SAR [†] (100-yr)	20-yr	100-yr	500-yr
Carbon dioxide	CO ₂	See below ^a	^b 1.4x10 ⁻⁵	1	1	1	1
Methane ^c	CH ₄	12 ^c	3.7x10 ⁻⁴	21	72	25	7.6
Nitrous oxide	N ₂ O	114	3.03x10 ⁻³	310	289	298	153

https://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html

METRICS (2017)



- Expanded program at the end of 2016 to include paper towels
- Switched from cart service to central 20 cubic yard roll-off in March 2017



PHASE 2: RESTROOM PAPER TOWEL COMPOSTING

MPG uses approx. 25 tons of paper towel annually; began collecting in a small number of buildings at the end of 2016 and now expanding the program each month.

Composted GHG Emissions

Assumed 40% TOC, 10 tons C
= 37 tons CO₂e

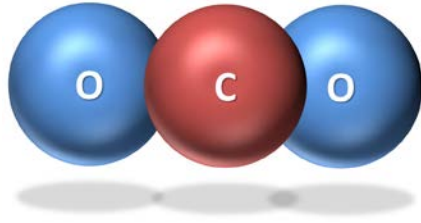
Landfilled GHG Emissions

5 tons CO₂ and 5 tons CH₄ (assume 50:50 split)
= 186 ton CO₂e

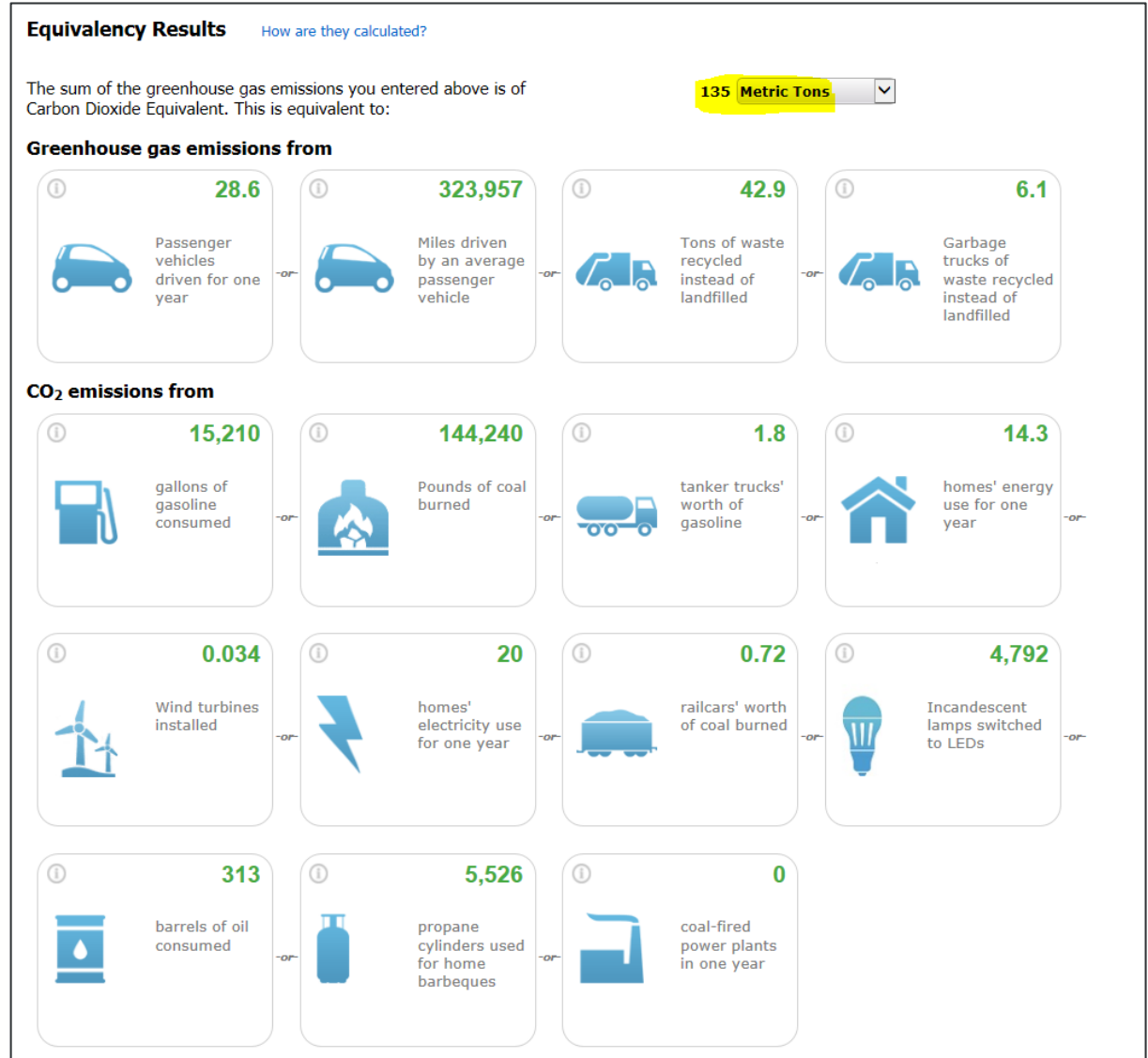
**149 ton CO₂e
reduction annually**



PHASE 2: PAPER TOWEL GHG EQUIVALENCY



<https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>



LESSONS LEARNED

- Decision makers must have a long-term, holistic perspective in order to justify the program and make it a success
- Tailor the program to fit the organization – there's nothing wrong with starting small
 - Implement paper towel first, or just the kitchen scraps
- Consolidate waste when possible to conserve liners (and money)
- Understand that the education phase will be an ongoing process
- Don't forget to explain the benefits to the participants

“You cannot get through a single day without having an impact on the world around you. What you do makes a difference and you have to decide what kind of difference you want to make.”

– Jane Goodall