

An Affordable, Buildable, Easy to Operate,
Commercial Rotating Drum Composter for
Schools, Organizations, and Small Communities



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Origins of our work

North Country School and Camp Treetops



Static bay animal bedding



Straw bale structures



Static bay food waste



Our first in-vessel composter at North Country School and Camp Treetops





Recognizing the need for affordable
community-scale composting

What is “community-scale”?

Sits in the space somewhere between backyard composting and large, commercial-scale composting

How we do this work



Through a partnership with the NYS not-for-profit, AdkAction

<https://www.adkaction.org/project/compost-for-good-2/>

Why we do this work

- We believe that in the not-too-distant future, treating organic material as waste will be considered absurd
- More and more states will require composting
- We believe that we have created an in-vessel design that could benefit communities around the world
- Community-scale composting builds local resilience, builds soil fertility, and helps reduce global greenhouse gas emissions

Greenhouse gas reduction--source and sink sides

- When food waste is buried in landfills it produces methane gas.
 - according to the US EPA, methane is 28-36 times more potent as a greenhouse gas than carbon dioxide
- There is some evidence that when compost is applied to land it creates conditions that allows the soil to become a carbon sink

Compost economics

- For on-site systems: reduces cost of transportation and tipping fees
 - Often seen as “the cost of doing business”
- Creates a value-added product that has high retail value in many markets
- Can reduce or eliminate the purchase of fertilizers for many facilities

Design particulars

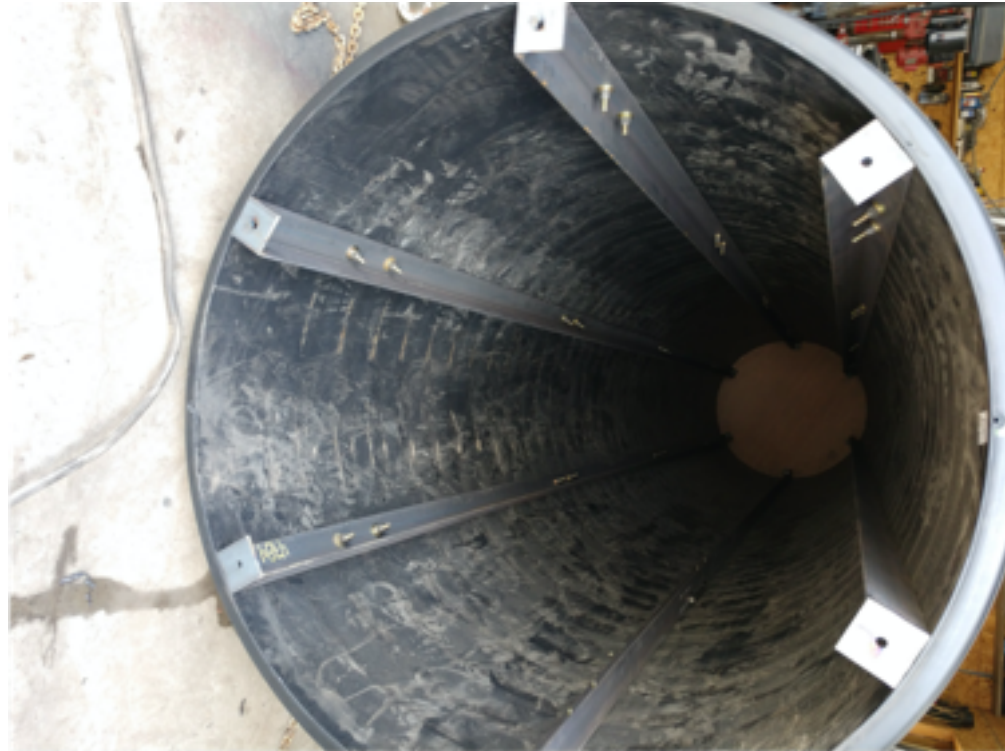
- Simple “off the shelf” materials that are widely available
 - The only component that gave us trouble were the steel bands which rest on the solid rubber drive wheels
- Can be operated within a 40-foot shipping container
- Drum separate from frame with frame angle easy to adjust
- Capable of processing unsorted food waste

Design particulars (cont.)

- Can be built by those with moderate shop skills, in a moderately well equipped shop
- Intentionally not automated, but could be
- Can process 200 pounds/day or more and up to 50,000 pounds/year
- Inexpensive: \$15K in material cost

Aeration/tumbling

- 3x3 angle iron inside of drum
 - provide rigidity
 - tumbles the material
 - provides an anchor point to bolt the outside bands



Is this the perfect in-vessel
composter?

Absolutely not

Designed to be modified

A closer look at modifications: discharge chute and “keeper wheel”



Getting more composters out into the world!

- A second NYSERDA grant allowed us to build and gift three more
 - All three in 40-foot shipping containers
- A New Jersey independent school built their own using our plans
- Five total
 - Four associated with schools
 - One at a natural history museum

The Wild Center in Tupper Lake, NY



Hermon DeKalb Central School



The Lake Placid High School/Shipman Youth Center composter



Lake Placid High School/Shipman Youth Center formed a student business, Placid Earth



North Country School and Camp Treetops compost operation

Collect and chop food waste



Mix food waste with carbon material



Carbon source—wood chips, shavings, and pellets



Load mixed material into composter



Rotating Drum



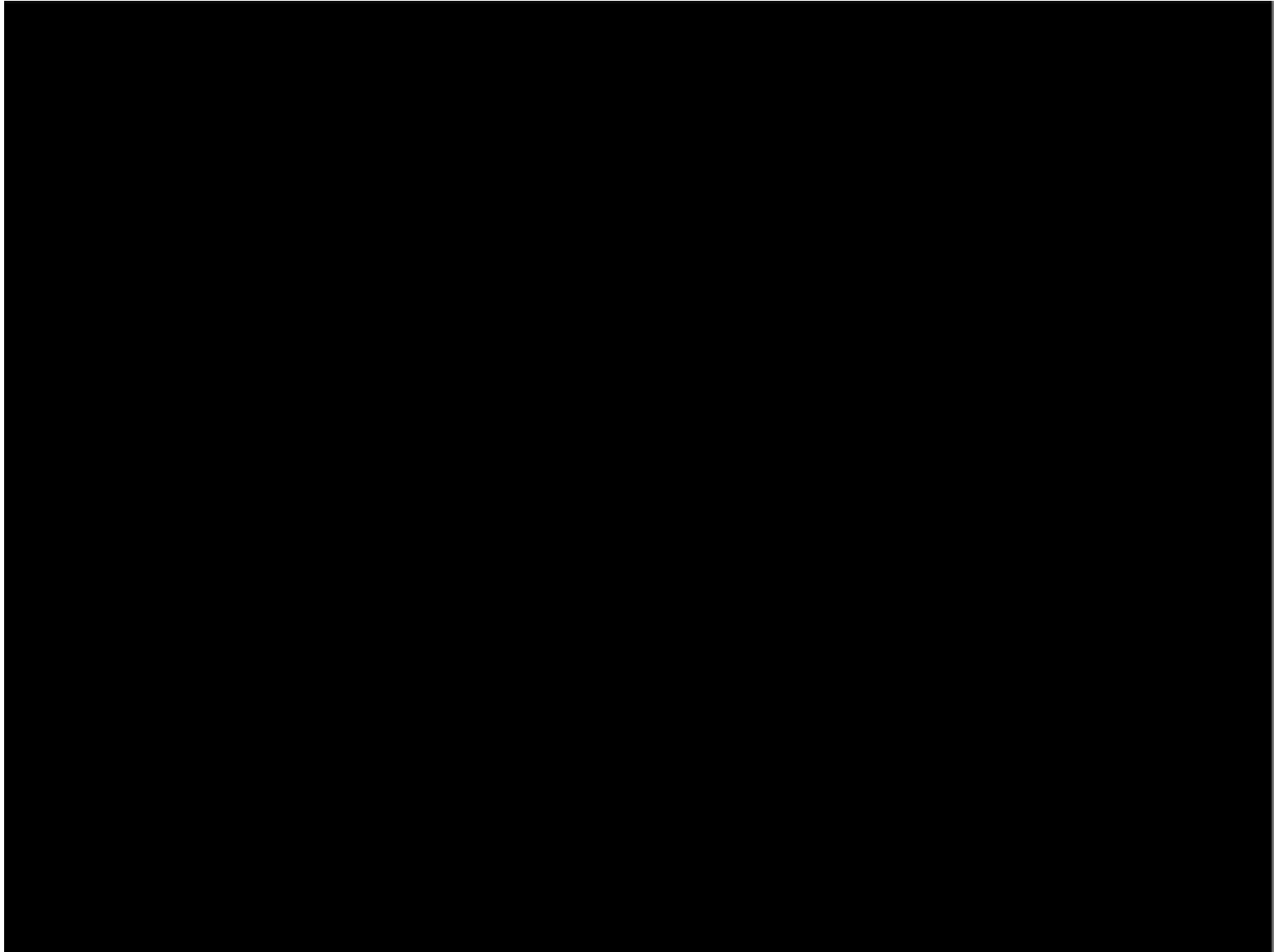
Drum rotation/retention time

- Drum should stay $\frac{1}{2}$ full all of the time
- Number of rotations or frequency of rotations depends on how much material is being loaded each day
- Material travel speed inside the drum depends on drum angle, speed of rotation, number of rotations, and how full the drum is

Stabilized discharged organic material



Sift discharged material



Secondary decomposition
is critical for producing quality compost



Uses for finished compost

Agriculture and forestry



Landscapes and sports fields



What Compost for Good can provide

- Free and available to anyone
 - Design document
 - 20-page operating manual
 - Fit-up document for shipping containers
 - Support for DIY-ers or contact information of contractors who can build and deliver
 - Social media where operators and interested parties can learn from each other
- Consultation for determining the right composting system for a community or organization, including possible fundraising support and grant writing assistance



CAMP TREETOPS
NORTH COUNTRY SCHOOL
ROCK-E HOUSE & BASECAMP



*Rotating drum composter
design guide*

ROTARY COMPOSTER

Keeper Wheel Frame



1) End Plate (from inside the drum)

12) 1/4" Steel End Plate (unpainted)

• Attached with 6 bolts through 3" x 3" flanges welded to 3" x 3" angle iron running inside the full length of the culvert. The end caps are bolted through these flanges.

17) Sheets of 1/2" expanded metal

• welded where they come together

18) 2" x 2" x 1/4" angle steel

19) 2" x 2" x 1/4" angle steel

20) 2" x 3/4" flat steel





CAMP TREETOPS
NORTH COUNTRY SCHOOL
ROCK-E HOUSE & BASECAMP



*Rotating drum composter
operating manual*

Open-source composter design allows

- Constant improvement
- Finding ways to lower cost
- Modifying design to accommodate
 - solar power, hand power
- Development of a community where lessons/resources are shared

Potential funding sources

- Operating funds
 - Consider the value of finished compost
 - Consider tipping fees and other costs associated with storing and hauling food waste
- Local, state, and federal sources
 - USDA, state environmental agencies, state energy agencies, etc.
- Foundations, local businesses, crowdsourcing, etc.

Food waste collection systems

- There are many different models for collection
- One close to us that seems replicable is Blue Line Compost:

<https://bluelinecompost.com/>

Experimentation: compostable products

- We've tried various items with various levels of success: paper plates; compostable bags; paper napkins; compostable flatware; old T-shirts; etc.
 - Items usually have to go through secondary decomposition
 - Chipping or shredding would greatly help
- Important to use only BPI (Biodegradable Products Institute) certified products

Experimentation: human urine as feedstock--NYS

- We have developed a recipe using only urine, wood pellets, and water which exceeds 131 degrees F for a week or more, meeting the US EPA's guidelines for Class-A biosolids compost
- We have processed over 2 tons of urine
- When added to food waste, seems to accelerate decomposition
- Has the potential to help solve environmental issues associated with contemporary wastewater treatment systems

Finished food waste and urine compost



For more information

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Visit:

<https://www.adkaction.org/project/compost-for-good-2/>