



Decentralized Composting: Infrastructure & Case Studies



**GREEN MOUNTAIN
TECHNOLOGIES**

Developing localized, low-risk, and
community-centric organics diversion
programs.

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About Green Mountain Technologies



- Commercial composting facility design and technology since 1992
- Hundreds of commercial facilities and In Vessel clients of all types and sizes
- Headquarters: Seattle, Washington

Why Decentralized Composting?

The Economics of Hauling:

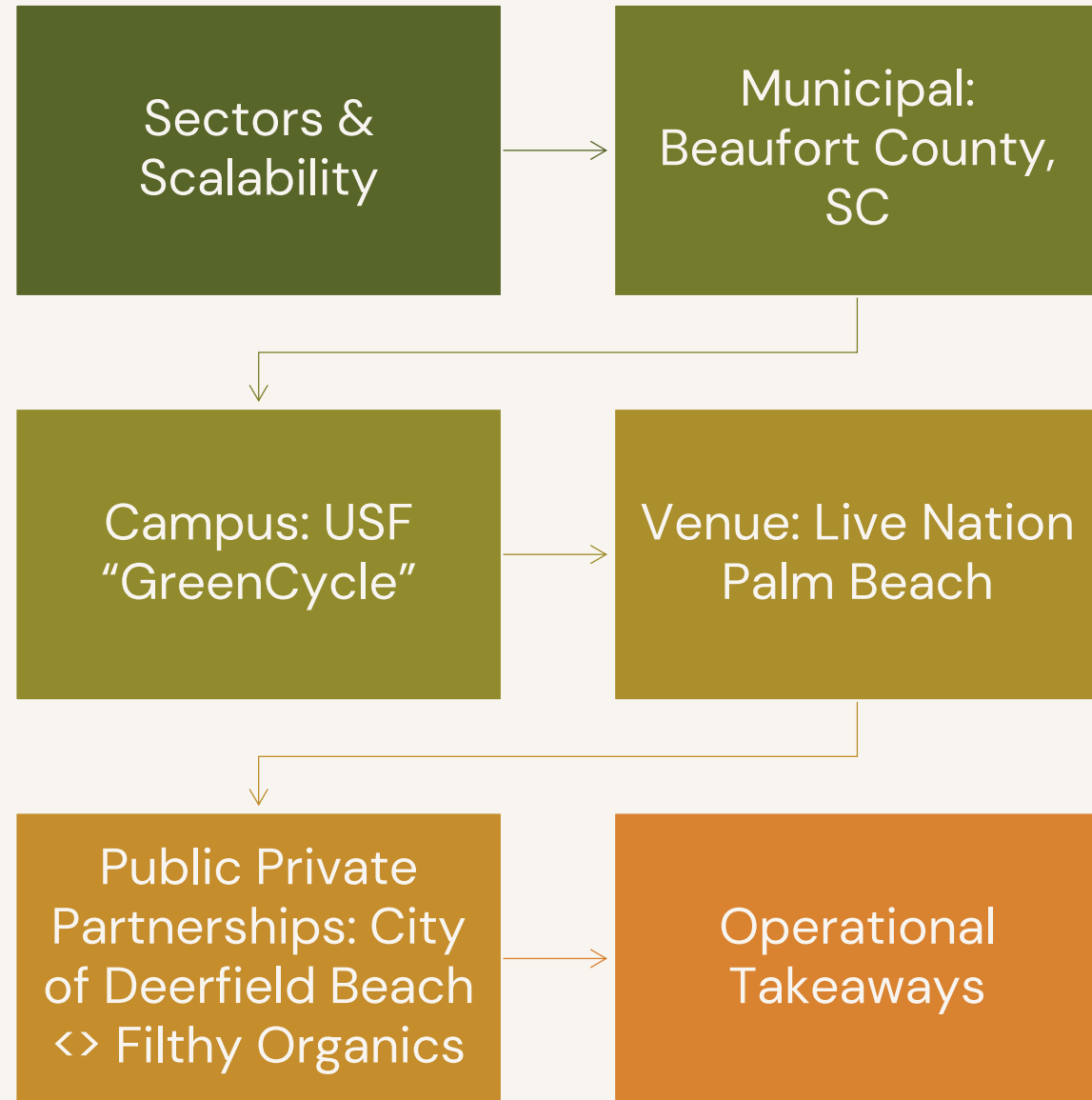
Traditional models rely on transporting heavy, wet waste long distances to regional landfills. This incurs unsustainable long-term costs in fuel, driver hours, and fleet wear.

Local Nutrient Capture: Keeping organic materials within the community boundaries turns a waste liability into a valuable local asset—retaining rich topsoil, improving water retention, and supporting local landscaping.

Minimized Risk & Footprint:

Decentralization allows you to start small, verify the biological process, control odor at the source, and bypass complex capital-intensive infrastructure requirements.

Agenda & Learning Objectives



Municipal Case Study: Beaufort County, S.C.

- **The Proximity Problem:** Transporting residential food scraps nearly 2 hours to the nearest regional facility was logistically and financially unfeasible.
- **The \$273K Grant Win:** Eliminated initial taxpayer financial risk by securing a \$273,600 USDA Composting and Food Waste Reduction grant to fund the startup.
- **30-Day Permitting Turnaround:** Navigated a first-of-its-kind municipal permit in South Carolina in under 30 days—pioneering a streamlined regulatory model.
- **Sealed Containment Victory:** Utilizing an enclosed, in-vessel Earth Flow system gave regulators 100% confidence in runoff, odor, and vector control.



Capitalization, Funding, & ROI Strategies



Grant-Absorbed Capital Risk: Utilizing federal and state vehicles (like USDA or EPA grants) to cover primary equipment costs without impacting local taxpayers.



Planning Document Alignment: Embedding composting targets directly into Comprehensive Plans or Climate Action Plans to legally and strategically justify funding allocations.



Flexible Financing Options: Leveraging tax-exempt Municipal Lease-Purchase bank agreements to spread equipment costs over time without issuing public bonds.

Campus Case Study: University of South Florida St. Petersburg (USF)

- **Project Initiative:** USF "GreenCycle" Decentralized Campus Program
- **Technology Deployed:** Green Mountain Technologies Intermodal Earth Flow (EF-IM20)
- **Key Operational Metrics:**
 - **Output:** Produces ~ 20 cubic yards of finished compost every 21 days.
 - **Feedstocks:** Able to process challenging materials including meats, dairy, sugars, fats, and compostable products.
 - **Odor Control:** Enclosed modular system with an advanced biofilter for seamless integration into a dense urban environment.
 - **Monitoring:** Web based data tracking system for temperature and aeration regulation.
 - **Strategic Partnerships:** A cross-sector collaboration backed by a USDA Composting Grant, the City of St. Petersburg, and Duke Energy to pioneer a community-scale circular economic model.



Venue Hubs: South Florida Amphitheater

- **The Surge Challenge:** Managing extreme, condensed volume spikes of service leftovers, cardboard, and compostable service ware over 4-to-6-hour concert event windows.
- **The On-Site Solution:** Direct source capture routes waste immediately into an insulated, mechanically-turned biological container, avoiding dumpsters sitting in hot Florida sun.
- **Zero Odor Boundary:** Negative aeration pulls process air through an organic wood-chip biofilter to neutralize volatile organic compounds (VOCs) near public parking zones.



Site Selection & Spatial Footprints

- **The Florida Aquifer Challenge:** Permeable sandy soils and a high-water table mean that traditional open-pad windrows pose a major run-off and groundwater contamination risk.
- **Strict Water Setbacks:** FDEP regulations mandate rigid setbacks to protect the water table: minimum 100 feet from surface waters and 250 feet from potable water wells.
- **Shrinking the Footprint:** Positive aeration and automated in-vessel systems decrease the required physical processing footprint by up to 70% compared to traditional open composting fields.
- **Utility Buffer Co-Location:** Allows municipal solid waste operations to easily tuck the program into existing paved public works yards, utility buffers, or underutilized transfer stations.



Engineered Containment & Odor Control



- **100% Leachate Containment:** Engineered concrete slab with perimeter curbs ensures every drop of process water is captured—never touching Florida's sandy soils.
- **Negative Pressure Airflow:** Process air is continuously pulled *downward* through the composting mass so odor cannot escape when the doors are opened.
- **Natural Biofiltration Pipes:** Exhaust air is funneled through underground pipes into a damp, wood-chip biofilter bed where native microbes naturally digest 99% of organic odors.



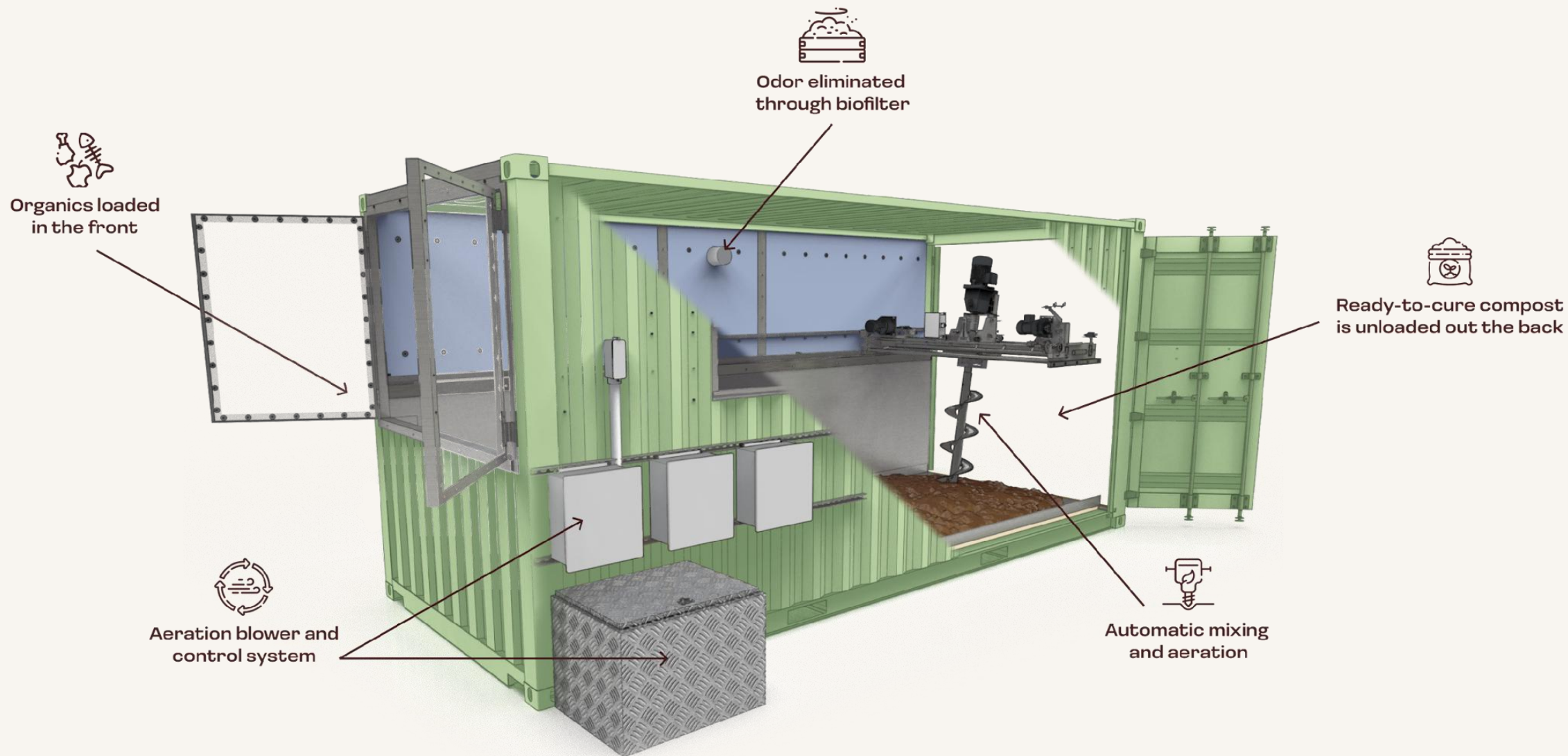
Win-Win Sourcing Partnerships

- **Balancing the C:N Ratio:** Wet food scraps are highly acidic and nitrogen-heavy. Biological optimization requires a balanced 30:1 Carbon-to-Nitrogen ratio.
- **FDEP Regulatory Advantage:** Under FDEP Rule 62-709, clean yard trash, wood chips, and land-clearing debris are categorized as "clean wood wastes" and are highly favored as compliant bulking agents.
- **Municipal Win-Win Partnerships:** Partner with municipal tree-trimming crews and local utility line clearers.
- **Zero-Cost Feedstock:** By offering crews a free, localized tipping yard closer to their routes, you save them haul time and landfill tipping fees while securing a 100% free, consistent supply of structural carbon.

FDEP Permitting Framework: Florida Rule 62-709

FDEP Exempt Status	SOPF Registered	Fully Permitted
On Site Generation Food waste generated on-site (schools, universities, correctional facilities) and composted on-site.	Definition: Source-Separated Organics Processing Facility registration under Rule 62-709.320.	Definition: Solid Waste Management Facility Permit under Rule 62-709.300 / 62-701.
Small-Scale Limits: Composting under 40 TPY of food residuals in leakproof, vector-free containers.	Eligible Materials: Composting yard waste, clean wood, manure, and vegetative food scraps.	Trigger Feedstocks: Handling post-consumer commercial food scraps, mixed solid waste, or animal byproducts.
Zoning Advantage: Exempt from FDEP permitting or registrations; subject to local zoning setbacks.	Streamlined Pathway: Bypasses full solid waste permits with a simple, annual online registration portal.	Rigorous Review: Requires full engineering designs, hydrogeological reports, and public notice.

Under the Hood: GMT Earth Flow Engineered Schematic



The Human Element: Participation & The Workforce

01

The Dedicated Champion & Redundancy: Identify a project leader to own the biological results, while cross-training secondary staff to ensure operational redundancy and zero-downtime.

02

Minimal Daily Labor Impact: Transition from manual labor tractor turning to "process management." The automated traveling auger handles mixing, requiring less than 4 hours of total staff labor per week.

03

Digital Process Controls & FDEP Logging: Cloud-connected temperature probes automatically log FDEP Rule 62-709 compliance data on autopilot, removing the administrative burden of manual pen-and-paper tracking.

Procurement Pitfalls: Avoiding the Dehydrator Trap

- **Mechanical Dehydration (Pre-treatment)**
 - **Purpose & Value:** Excellent technology for rapid, high-heat moisture and volume reduction, pasteurization, and weight reduction.
 - **FDEP Regulatory Reality:** Under FDEP Rule 62-709, dehydrated output is legally classified as "raw, unstabilized waste."
 - **Curing Requirements:** Because the material has not been biologically stabilized, it cannot be land-applied in Florida as compost without a secondary curing phase.
 - **Utility Focus:** Draws continuous electrical energy to run thermal heating elements for rapid moisture evaporation.
- **True Biological In-Vessel (Composting)**
 - **Purpose & Value:** Relies on positive aeration and natural microbial digestion to fully cure, stabilize, and transform organic waste.
 - **Compliant Compost:** Consistently meets FDEP (Rule 62-709) and PFRP pathogen reduction standards by maintaining natural thermophilic temperatures exceeding 131 (55)
 - **Legal Land Application:** Yields a stable, nutrient-rich soil builder approved for immediate land application, native landscaping, and 100% legal landfill diversion.
 - **Utility Focus:** High energy efficiency, utilizing low-horsepower blowers to support natural microbial respiration.

Public Private Partnership (PPP) Case Study: City of Deerfield Beach <> Filthy Organics

Cooperative Municipal Models

- **The Cooperative Blueprint:** Municipal land allocation paired with private biological operational management.
- **City Contribution:** City provides an underutilized public works buffer zone, clear zoning alignment, and local wood chip carbon feedstocks.
- **Operator Contribution:** Private composting partner handles the daily feedstock blending, moisture control, and FDEP compliance reporting.
- **The Shared Win:** Drastically reduces municipal capital overhead and technical risk while meeting local waste diversion metrics.



Agriculture & Equine Case Study: Blu Sky Farms (Ocala, FL)

- **The Feedstock Challenge:**
Processing massive volumes of nitrogen-heavy horse manure mixed with high-carbon stable wood shavings in Ocala, the horse capital of the world.
- **System Sizing:** Operating a GMT Earth Flow CV 4012 site-built concrete bunker system with a capacity of 900+ Tons per Year (Installed in 2024).
- **Microbial Pathogen Control:**
Consistently maintains high temperatures (to) for 3+ days to thoroughly eliminate equine parasites, flies, and weed seeds.





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Let's Compost Together

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