



Island-Wide Organics Feasibility Study: Project Report Summary May 2017

The purpose of the Island-Wide Organics Feasibility Study was to examine issues around food waste recycling on the Island and develop recommendations for local food waste management. The Martha's Vineyard Vision Fellowship funded the study and it has been my pleasure to serve as the project manager for the past year. I worked on an issue I am deeply passionate about, worked with a great committee, and collaborated with many Island organizations, businesses and individuals who are

concerned about this problem and committed to finding solutions.

There is momentum and excitement to reduce, recover, and recycle food waste on the Island. Recycling organic waste locally means keeping this valuable resource on-Island and reducing our environmental impact while beginning to close the loop on the Island's food system. We hope the results of this study help move those efforts forward.

Sophie Abrams, *Project Manager*



Sophie composting food scraps at the MV Ag Fair

Disclaimer:

The research done for this study was the first of its kind on MV. Because of that, our calculations are estimations based on the best resources we could find. Our population numbers came from the Martha's Vineyard Commission and MV Chamber of Commerce, and the numbers used to estimate quantities of residential and business food waste came from RecyclingWorks and the ReFED roadmap. See the full report for more information.

A National Challenge

It is estimated that 40% of food produced in the United States is never eaten. At the same time, an estimated 1 in 6 Americans are food insecure, not being sure of where their next meal will come from.

- 16 million tons of food are discarded as garbage every year, enough to fill the Rose Bowl stadium every day.
- 83% comes from consumer-facing businesses (restaurants, grocery stores) and from homes.
- \$218 billion is spent every year growing, processing, transporting and disposing of food that is never eaten.
- Food waste consumes 21% of our fresh water use, 19% of all fertilizer, 18% of cropland and 21% of what is in our landfills.

Public awareness, new technologies and regulatory steps can change these statistics. The federal Environmental Protection Agency and the Department of Agriculture have set goals to reduce food waste 50% by 2030 through reduction, repurposing excess food and recycling through composting, energy production and other strategies.



Food scraps collected from Island restaurants

Our Island Challenge

Trash is the Island's main export, a fact anyone can observe on a freight boat trip off-Island. According to Don Hatch, district manager of the Martha's Vineyard Refuse District (MVRD), as much as 19,000 tons of trash are sent off-Island every year. Our calculations show an estimated 6,500 tons of that waste is food (37% of our municipal solid waste (MSW)). There are no longer any operating landfills on the Island. The Island's two transfer stations in Oak Bluffs and Edgartown take trash from the entire Island, load it onto large trucks and haul it to off-Island landfills or incinerators for disposal.

The Island-Wide Organics Study was initiated partly in response to the impending enforcement of the Massachusetts Department of

Environmental Protection's (MDEP) commercial food waste ban that targets food operations generating one ton or more of organic waste per week. They are now required to separate and recover for people or animal food, compost, or send it to an anaerobic digestion facility. The Island currently has no composting or anaerobic digestion facility for food waste. Neither transfer station is currently able to accept separated food waste for composting. Except for a couple of farms that accept small amounts of food waste to feed animals, or make compost, there is no system currently in place for addressing the MDEP ban or implementing an Island-wide program. This report presents the findings and recommendations of the Island-Wide Organics Study Committee.

Activities and Findings

What We Did

- Reviewed literature: research and reports on local, regional, and national food waste recycling programs;
- Toured seven food waste composting facilities in the Northeast;
- Toured a food waste extrusion facility in California;
- Toured a food waste anaerobic digester in Massachusetts;
- Conducted residential and business surveys;
- Developed criteria and ranked food waste processing technologies for the Island;
- Conducted a food waste collection pilot project at several restaurants;
- Educated the public about the issue of food waste through events and the media.



In-vessel composter

What We Learned

Food-waste processing Island-wide must be sized to handle the fluctuating population, estimated at 16,500 year-round, with an additional 98,500 in the summer. With current generation of 6,500 tons of food waste per year, a composting facility would need to process 18 tons of food waste per day, and in the peak summer tourist day, up to 72 tons per day (assuming 100% of food waste was being captured).

Carbon sources like wood chips, leaves, soiled paper or cardboard are needed at 2 to 3 times the volume of food waste in most composting processes. Island food waste composting could also provide a local use for cardboard and paper that are

currently shipped off-Island for recycling.

The study concentrated on business food waste production because of the existing MDEP ban, which includes businesses producing 1 ton or more of food waste in ANY week of the year. There are roughly 121 restaurants and 5 grocery stores on the Island, producing some 1,746 tons of food waste yearly. Estimates show that 18 of these fall under the MDEP requirements, and another 10 are close.

The team identified six possible approaches to food waste recycling on Island, and those technologies were ranked using 27 potential benefits and concerns to assess the feasibility of these approaches. The results, including the most important benefits and concerns with each technology, are summarized here:

Technology	Benefits	Concerns
Extrusion	Small space needs. Produces animal feed. Minimal odor, pests, and leachate. Separates inorganic contamination.	High capital and operating costs. Doesn't process leaves, wood chips, and non-recyclable paper. Local markets for animal feed must be developed. Few reference facilities. Contamination causes problems.
Anaerobic digestion	Generates electricity and heat from food waste. Minimal odor, pests, and leachate.	High capital costs. Markets for by-product must be developed. Contamination causes problems.
In-vessel composting	Lower capital costs than extrusion and anaerobic digestion. Reduces processing time, and incorporates leaves, wood chips and non-recyclable paper/cardboard. Minimal odor, pests, and leachate. Capacity can be increased with modular units.	Higher capital costs than windrow composting. Contamination causes problems.
Turned windrow composting	Easy to implement. Low-tech and low equipment needs.	Potential for odors, pests, and leachate. Large space needs. Contamination causes problems.
ASP composting	Medium processing time. No need to turn piles.	Contamination causes problems.
Off-Island transport	The concerns with local processing are not present, as waste is shipped away.	Fossil fuel intensive process. Losing valuable resource that could be repurposed.

Potential Economic Benefits

Based on information from both local transfer stations and the summer Pilot Project, it cost approximately \$44 less per ton to process food waste on-island when taking into account shipping, trucking and tipping fees. The table below assumes that 100% of the Island's food waste would be diverted:

Dispose Waste Off-Island	Process Food Waste Locally	Total tons MSW per year	Est. tons food waste	Annual savings
\$96 per ton	\$52 per ton	19,000	6,500	\$286,000

More work is required to estimate costs of constructing and operating an on-Island composting facility.

Project Recommendations

Pursue funding and economic analysis for in-vessel equipment to be located at one or both of the Island's solid waste transfer stations.

Two technologies were ranked highest for on-Island food waste processing infrastructure: in-vessel composting – a contained composting process – and extrusion – turning food waste into a high quality component for animal feed. Due to the benefits and concerns summarized on page 2, it was determined that in-vessel composting is the most favorable and feasible solution for the Island.

In-vessel composting involves large, slowly rotating cylinders, or other enclosed containers, that blow air into the organic waste to attain optimal temperatures within the container. It accelerates the active composting process and meets the ranking criteria for minimal space, minimal issues with pests, odor, and leachate, while also processing other products that need recycling: leaves, wood chips, and non-recyclable paper and cardboard. Once the in-vessel process is completed, in as little as 5 days, the compost requires further curing for use, and could be done at the farms and businesses that produce and/or need compost.

A detailed economic analysis will be required to estimate the costs to permit, design, construct, and operate an in-vessel composting facility.

Support and encourage farmers and other businesses to develop licensed composting operations that can accept the in-vessel product or direct food waste.

Island farmers, landscaping businesses, and homeowners need compost. The sandy soils on the Island need organic matter. Large quantities are currently purchased from off-Island sources. Composting food waste would generate a local source of compost, and a business opportunity. Turned windrows, which local farmers and businesses are using or planning, were ranked lower in the study because of the pest, odor, leachate, space, and neighbor issues. However, this process is recommended for the compost curing required after the in-vessel process.

Pursue business possibilities for pick-up service.

The pilot project picked up 16 tons of food waste from restaurants in six months, demonstrating that restaurant staff are willing and able to separate food waste and divert it to composting in a cost-effective program. There are two main barriers currently inhibiting existing haulers like Brunos Roll-Off, and ABC, from picking up food scraps: lack of a commercial-scale composting facility, and an insufficient number of food scrap generators separating organics. In order to establish a viable organics collection program, there has to be sufficient “route density” of organic waste generators, i.e. enough material to fill a truck. One business model being considered is for the two large trash haulers to contract with smaller haulers such as the Island Grown Initiative.

Promote Island-wide food waste reduction, recovery, and recycling.

While this study focused on the need to respond to the MDEP commercial food waste ban, we also promoted Island-wide food waste reduction, recovery, and recycling, through events, educational offerings, and the media. Processing food waste locally would cost less than the current process of shipping food waste off-Island, and improves our environment. Implementing reuse, recover, and recycle activities on the Island can also reduce food insecurity, a problem that is getting increased attention.



Food waste bins used at Island events



Sophie Abrams with food waste volunteers Sarah Ives, Taylor Ives and Libby Bouck at the MV Ag Fair



Sakiko Isomichi collecting food waste from restaurants



The SAFE extrusion facility in Santa Clara, CA turning food waste into animal feed

Next Steps and Resources

Though officially ending, the Island-wide feasibility study points to many follow-up efforts. The study team will join other individuals, organizations and businesses to pursue Island-wide goals for food waste reduction, recovery and recycling. There are many local, state and national efforts to guide us.

The MVRD is in the process of approving its capital improvement plan, which allows space for an in-vessel composter in the future.

The pilot project for restaurant food waste pick up is now being operated by Island Grown Initiative, and Sophie Abrams will be managing an expansion of that program this summer.

Island Grown Initiative has plans to expand the gleaning

program, the only significant “recovery” effort currently on the Island.

The study’s residential survey pointed to a significant need for training residents about backyard food waste composting. Study staff did one such workshop at the Farm Institute and this model should be continued.

The towns have received funding for food waste containers and educational materials. These will be used to set up food waste drop-off locations at the town transfer stations.

The study did not address food waste at grocery stores, hospitals or schools. After some additional work with these food waste generators, they will be invited to participate in the Island Grown Initiative’s collection program.

Resources

The full report will be available on the Martha’s Vineyard Vision Fellowship and Island Grown Initiative’s websites starting in June 2017. www.igimv.org ~ <http://vineyardvision.org>

- ReFED Report: A Roadmap to Reduce U.S. Food Waste by 20 Percent <https://www.refed.com/?sort=economic-value-per-ton>
- NRDC Study: Wasted: How America Is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill by Dana Gunders <https://www.nrdc.org/sites/default/files/wasted-food-IP.pdf>
- Food: Too Good to Waste (FTGTW) implementation guide and toolkit <https://www.epa.gov/sustainable-management-food/food-too-good-waste-implementation-guide-and-toolkit>

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