



Noblehurst Green Energy Natural Upcycling

Creating a Sustainable Future for Our Community

Urban Food Waste Solutions Workshop
August 5, 2019



Food Waste in the Big Picture

- 40% of all food in the United States is wasted
- In other words 36 million tons of food waste is generated annually yet only 3% is recovered/recycled
- Food waste is the second largest contributor to landfills in America behind paper
- Why is recycling food waste difficult?
 - Wet/messy – not sexy
 - Poor/lack of infrastructure to handle
 - Can be expensive
 - It smells!!!! Especially in summer.....
 - Fortunately I'm a dairy farmer and used to off smells....

Introductory Video



In the USA
farmers are developing
innovative ways to work with
renewable sources of energy

Noblehurst Green Energy



Noblehurst Green Energy

- 1.33 million gallon EnviTec complete mix digester
- 450 kW Guascor CHP net metered with National Grid
- Wholly owned subsidiary of Noblehurst Farms
 - 1800 cow multi-generation, multi-family dairy farm
 - Farming 3000 acres of corn, alfalfa and triticale
- Co-located with Craigs Station dairy complex
 - Craigs Station Creamery separation facility operational in 2014
 - Craigs Station Cheese facility commissioned February 2018
 - Innovative wastewater pre-treatment by Clear Cove Systems

Current Process

Current Process:

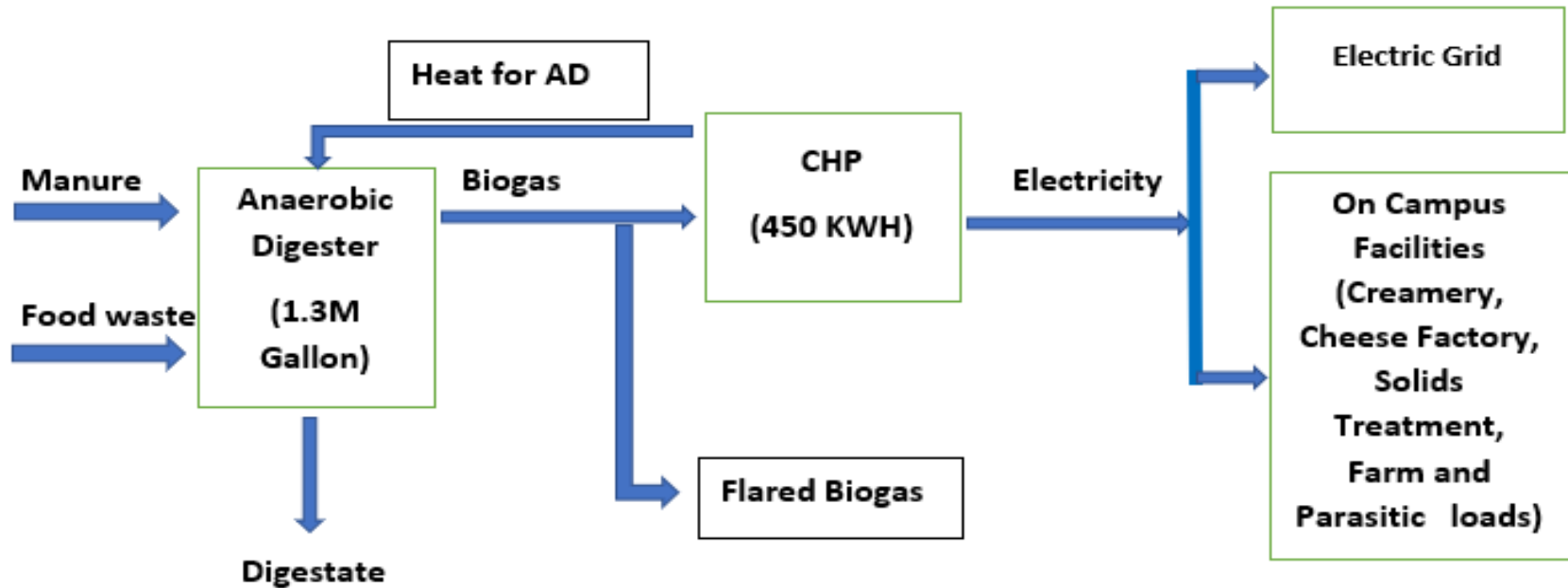


Figure 1: Current Process at NGE

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- Current feedstocks
 - Manure from 1800 dairy cows at Noblehurst Farms
 - Committed high-strength dairy processing waste direct piped from Craigs Station Cheese facility
 - Additional acid whey and high-strength volumes direct piped from Craigs Station Creamery
 - Source separated organics – up to 15 tons per day of clean, pre-consumer material delivered by Natural Upcycling
 - Packaged liquid and semi-solid organics – processing 20-30 tons per day of juices, soda, syrups, etc. delivered by Natural Upcycling
 - Bulk tanker loads including condensed whey from Craigs Station Cheese and customers in the region

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- Challenges
 - Logistics: from customer to disposal site
 - Contamination: wanted control over the feedstock quality
 - Variety: all food waste isn't created equal
 - Episodic: especially on packaged food waste
- Solution



NaturalUpcycling

CREATING A SUSTAINABLE FUTURE FOR OUR COMMUNITY

Who is Natural Upcycling

- Leading Regional Food Waste Recycling Business
- Created in March 2014 and Founded by
 - Harry Cohen – formerly of Total Organics Recycling of St Louis, MO
 - Christopher Noble – Noblehurst Green Energy of Linwood, NY
- Formed to Provide Securitized Source of Food Waste to Anaerobic Digesters and Compost Operations
- Rationale
 - Very segmented/fragmented space with no clear winning strategy
 - Food waste collection not core business for large trash companies
 - (Can be) Complicated logistics – from customer to disposal site
 - New FSMA regulations pushing food waste out of animal feed
 - States and cities beginning to mandate food waste diversion
 - Next frontier of waste and recycling – huge growth opportunities

Types of Food Waste Collected

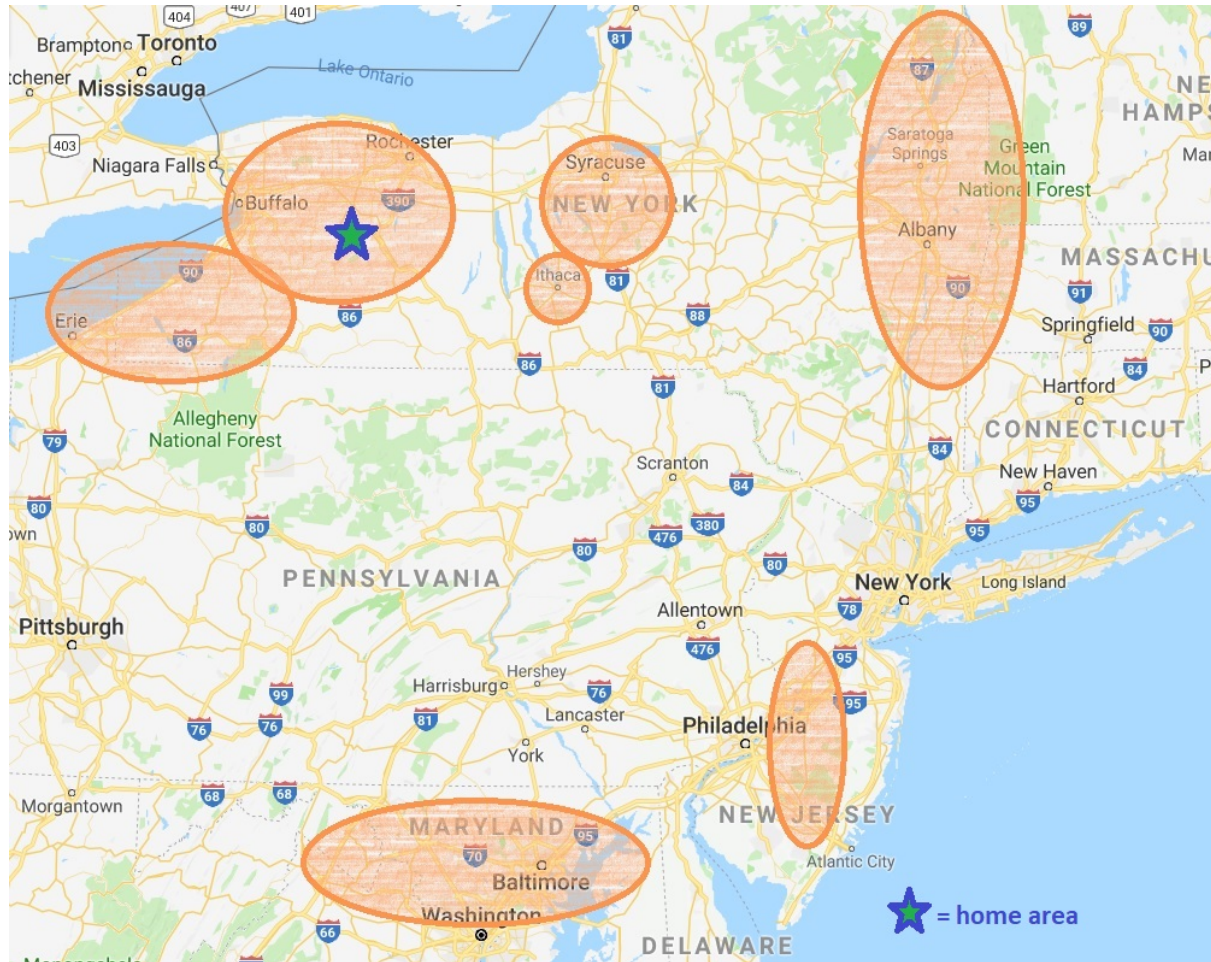
- Traditional Substrates
 - Food Processing residuals (mostly for animal feed)
 - Bulk Tanker loads
 - Food and Dairy Processing (whey, food manufacturing by-products, etc.)
 - Slaughterhouse Waste (meat renderings)
 - FOG (Fats, Oils, Greases) and Glycerin
- New/Emerging “Challenging” Substrates
 - Source-Separated Organics (SSO)
 - Pre-consumer (grocery stores, food processing, cafeterias)
 - Post-consumer food scraps
 - Packaged Food Waste
 - Off-spec, mislabeled bottled products
 - Semi-solid (viscous products that can be cut with water)
 - Canned and chunky (e.g green beans in tin cans)

SSO Collection Service

- Participating businesses place food waste in color-coded bins located in kitchens or food prep areas.
- Once bins are loaded, they are wheeled to a back dock or other convenient location to be picked up.
- These bins are serviced up to 5 days per week by a specialty vehicle and cleaned by a high pressure system all contained within the truck.
- Sanitized containers limit odor and provide a sterile work environment.



Where we are – SSO collection



NYS Accelerating Organics Diversion

For Release: Tuesday, June 12, 2018

New York State Announces \$4 Million in Grants to Expand Food Waste Recycling

Grants will Expand State's Capacity to Reduce and Divert Wasted Food

Supports Governor Cuomo's Goal to Reduce Greenhouse Gas Emissions 40 Percent by 2030

New York State Department of Environmental Conservation (DEC) Commissioner Basil Seggos today announced \$4 million in grant funding for generators of excess wholesome food and food scraps to expand their capacity to donate wholesome food or divert it to organics recycling facilities. An estimated 40 percent of the food produced in the United States goes uneaten while about 2.5 million New Yorkers are food insecure. In addition to wasting natural resources, including water and nutrients, to produce food that will never be consumed, much of this organic waste is disposed of in solid waste landfills where its decomposition accounts for more than 15 percent of U.S. emissions of methane, a potent greenhouse gas.

DEC Commissioner Seggos said, "New York is already transforming the way we look at food waste and its implications for local communities by recognizing the importance of food scraps on our environment, economy, and health. The grants announced today will bolster Governor Cuomo's efforts to reduce the greenhouse gas emissions contributing to climate change while providing food for hungry New Yorkers and diverting waste from landfills."

Empire State Development President, CEO and Commissioner Howard Zemsky said, "The grant funding we administer will ensure New York's businesses continue to recycle and operate in an efficient and environmentally-conscious manner, all while combating food insecurity and giving back to the state's communities."

New York's large food scraps generators-supermarkets, restaurants, colleges, and hospitals-generate more than 250,000 tons of wasted food and food scraps each year, some of which is edible food. If just five percent of this material were donated, food banks would see an increase of 20 percent in the amount of food available for consumption by those in need. If these food scraps were diverted from landfills, more than 120,000 metric tons of carbon dioxide equivalence reduction could be achieved each year.

The funding is provided by the State's Environmental Protection Fund (EPF) and is administered by Empire State Development (ESD). ESD has contracted with the New York State Pollution Prevention Institute (P2I) to operate the funding program. P2I is working closely with DEC on multiple efforts to reduce the generation of food scraps and recycle food scraps that remain and this funding will help generators expand their sustainability efforts.

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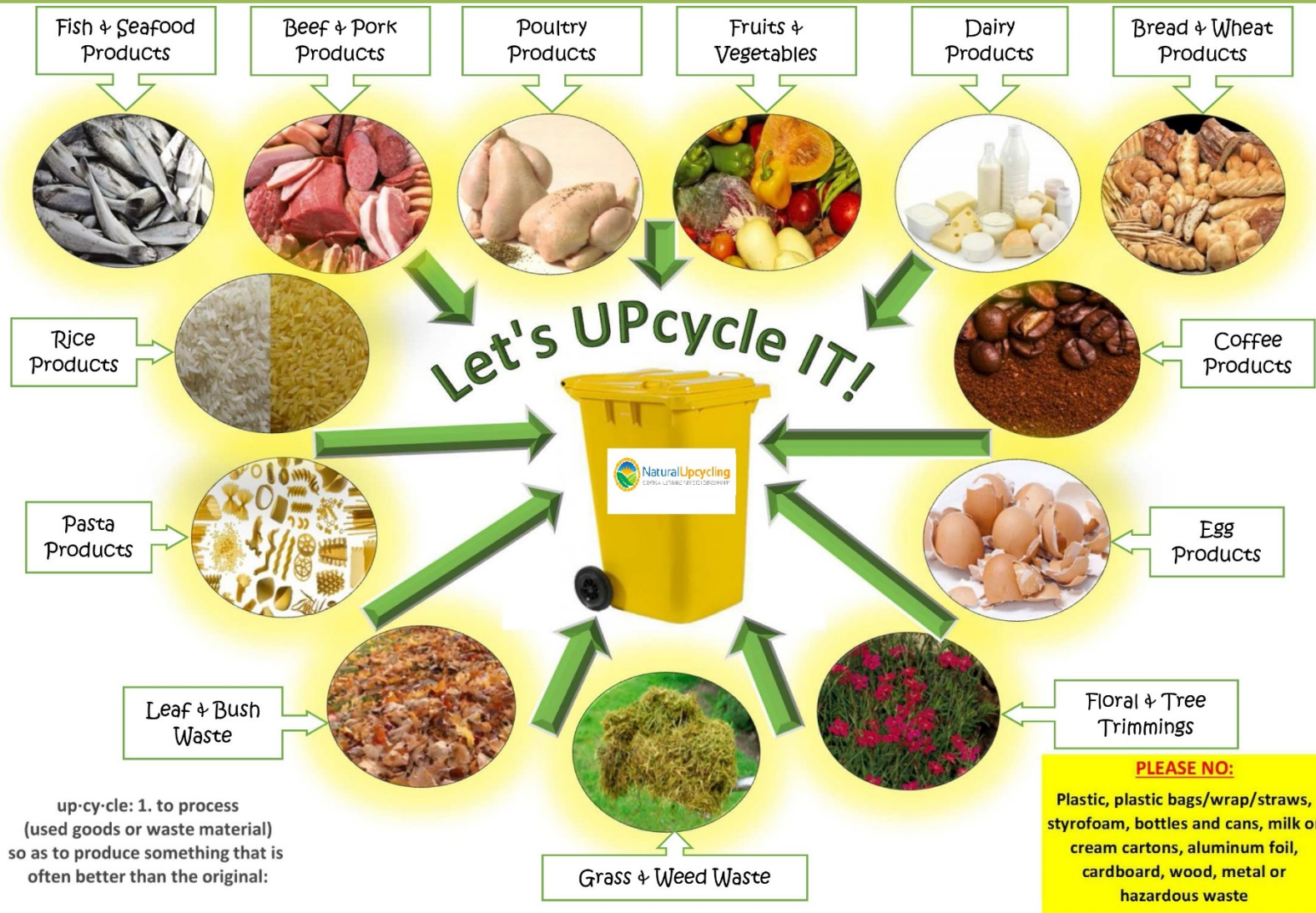
What We Do Well

- Align with companies that are leaders in sustainability
- Reduce methane gas emissions & create renewable energy
- Communicate with our partners and customers
- Share the message of keeping food waste out of landfills
- Core value of doing the right thing

Sample Customers



What Can Be Upcycled?



The Catch of the Day



Packaged Food Waste

- Tailored to Food Retailers and Manufacturers
- Heightened food safety standards and product recall costs are increasing amount of packaged food waste disposed of
- Heterogeneous product mix and one-time events makes for challenging disposal solutions – needs to be flexible



Packaged Food Waste

- Developed strategic relationships with disposal sites that can cost-effectively accommodate these substrates
- Sites in New York, Pennsylvania, Connecticut and Ohio



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Reinford Farms, PA

Urban Food Waste

- Natural Upcycling has focused on suburban and commercial food waste collection
- Pros
 - Lower collection costs per ton in absence of regulation
 - Generally higher volumes per customer location
 - Less contamination overall (helps with dearth of sophisticated processing infrastructure)
- Cons
 - Weak route density versus urban areas
 - Areas with sufficient route density with smaller commercial customers (or mix) does work in urban areas

Urban Food Waste

- What models have we seen work in urban areas?
 - Smaller residential scale collection with strong route density, coupled with commercial pickup from central location
 - Transfer station where the residents bring food waste to central location (e.g. Tompkins County)
 - Mandated county or city-wide collection

Urban Food Waste

- Research priorities
 - Innovative ways to tackle the 800 pound gorilla – post-consumer and/or residential food waste
 - If we are trying to repurpose the food waste nutrients, how do we most effectively segregate and decontaminate the food waste stream?
 - Fostering development of better food waste decontamination technologies (depackaging)