Finger Lakes Food Processing Cluster Initiative

Advancing the competitiveness of the food processing cluster in the Finger Lakes region

Sustainability in Food Processing

Rochester Institute of Technology
Tuesday, June 18, 2013

Center for Integrated Manufacturing Studies
ROCHESTER INSTITUTE OF TECHNOLOGY

Finger Lakes Food Processing Cluster Initiative funded by:

E·D·A U.S. ECONOMIC DEVELOPMENT ADMINISTRATION

UNITED STATES DEPARTMENT OF LABOR
Employment and Training Administration

SBA U.S. Small Business Administration

P2I New York State Pollution Prevention Institute

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The food processing cluster is defined as a business that directly impacts the food processing supply chain. It entails growing of crops or raising livestock, manufacturing of agricultural or food processing equipment, processing of food, support of the process (producing labels, boxes, cans, bottles, etc.), and/or the selling of the finished product; often referred to as ***"Farm-to-Fork."***

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Agenda

9:00 – 9:15am	**Welcome** Andy Harlan, Center for Integrated Manufacturing Studies **What is sustainability? How does it apply to the food sector?** Dr. Anahita Williamson, New York State Pollution Prevention Institute
9:15 – 10:00am	**Panel 1: Solid organic waste reduction or repurposing** Moderator: Andy Harlan, CIMS
10:00 – 10:05am	**Break**
10:05 – 10:50am	**Panel 2: Water Recovery** Moderator: Rajiv Ramchandra, NYSP2I
10:50 – 10:55am	**Break**
10:55-11:40am	**Panel 3: Food Waste to Energy** Moderator: Dr. Tom Trabold, Golisano Institute for Sustainability
11:40 – 12:00pm	**How to get started and Available Programs**
12:00 – 12:30pm	**Golisano Institute for Sustainability (GIS) Building Tour** - *Optional*

Sustainability

Brundtland Commission: Convened by United Nations in 1983

- Commission created to address growing concern 'about the ***accelerating deterioration*** of the human environment & natural resources and the ***consequences of that deterioration*** for economic & social development'
- Recognized that environmental problems were global in nature & determined that it was the common interest of all nations to establish policies for sustainable development
  - ***"..development that meets the needs of the present without compromising the ability of future generations to meet their own needs"***

Green engineering:

- **The design, commercialization, and use of processes and products, wh feasible and economical *while minimizing***
  - **1) generation of pollution at the source**
  - **2) risk to human health and the environment.**

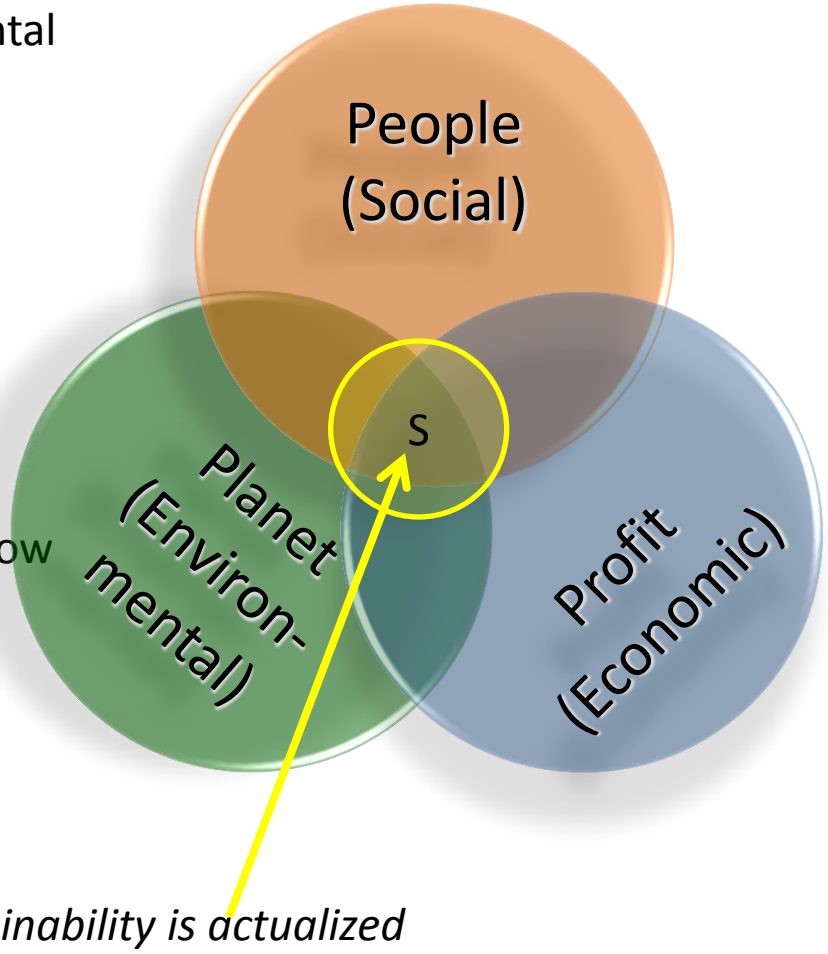
Sustainability – Defined

Many Phrases for the Same Concept

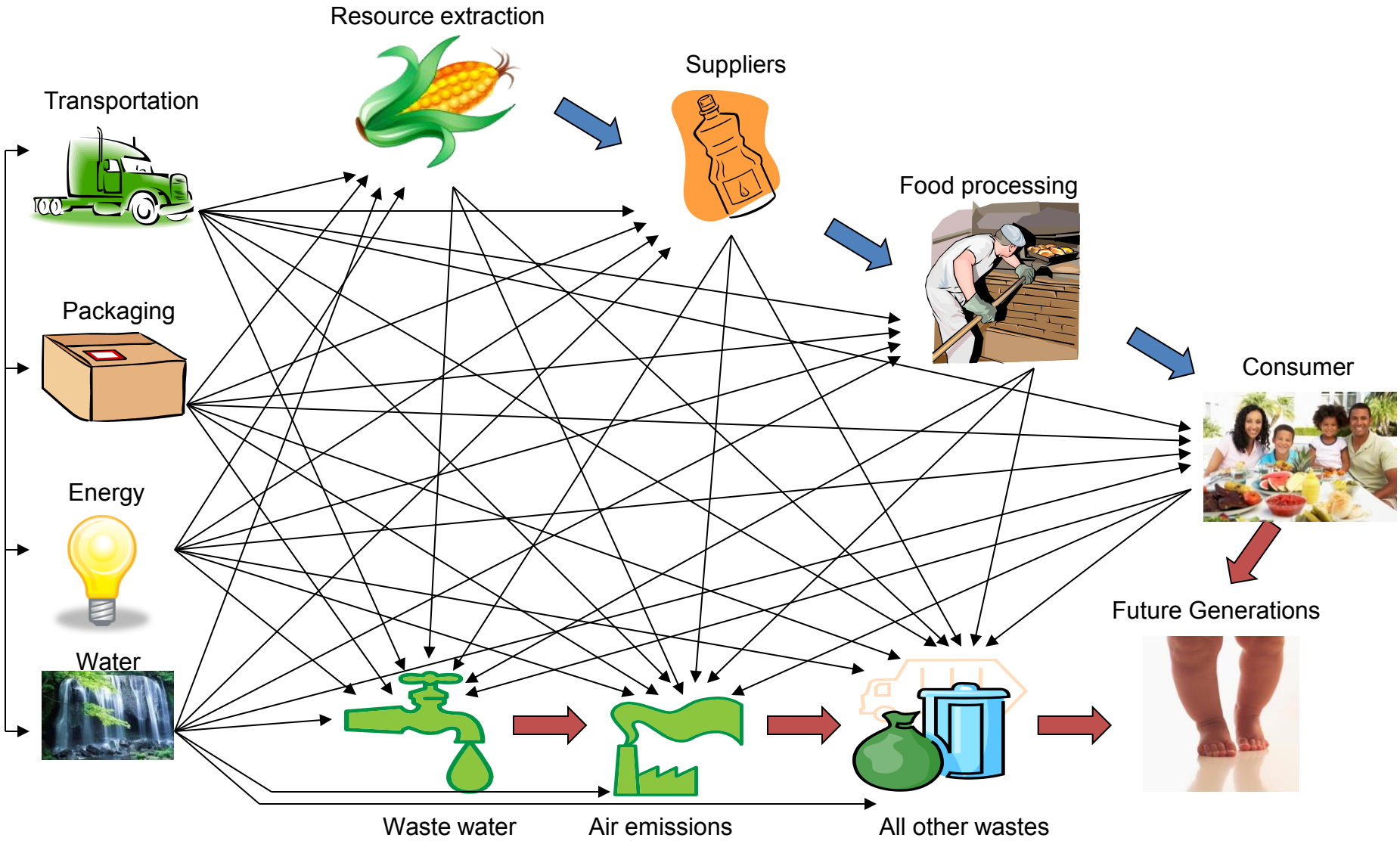
Many terms for addressing social, environmental and economic initiatives:

- "3Ps" – People, Planet, Profit
- Social, Economic, Environmental
- "Corporate Social Responsibility"
- "Corporate Citizenship"
- "Sustainable Growth"

Each company or organization should define how they address "sustainability".



Product Life Cycle and Environmental Impacts: Internal & External



4. **Measure and monitor -** Environment

Environmental Assessment -

Food Processor (NYC)

About the Company: A food processor located in Brooklyn, NY, is a producer of various specialty fish products such as smoked salmon. They purchase frozen fish and thaw them with city water as the first processing step. Processor uses approximately 30 million gallons of water per year at a cost of $245,000.

Work Performed: The NYSP2I, in collaboration with ITAC, Acme, and Energy Concepts:

- Determined the amount of heat available from an on-site CHP system
- Developed fish thawing models
- Ran fish thawing tests
- Documented incoming city water temperatures: 54ºF average for 2009 with a low of 35ºF

Results: The Analysis determined that:

Additional waste heat from the CHP can provide enough hot water to thaw fish year round with 63ºF water. The estimated water use would become 7.8 million gallons per year at a cost of $57,000.

- Water reduction of 74%.
- Cost savings of $188,000 per year.

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Panel 1: Solid organic waste reduction or repurposing

Moderator:

Andy Harlan, CIMS

Panelists:

Mike Coia, Seneca BioEnergy - Finger Lakes Grape Seed Oil

Dave Fister, NYSP2I - Cheese Manufacturer Case Study

Kathleen Draper, Finger Lakes Biochar

Practicing Sustainable Manufacturing
Waste Beneficial Reuse and Renewable Energy
@ Seneca AgBio Green Energy Park

Seneca BioEnergy, LLC

500 Technology Farm Drive – Suite 12
Geneva, New York 14456

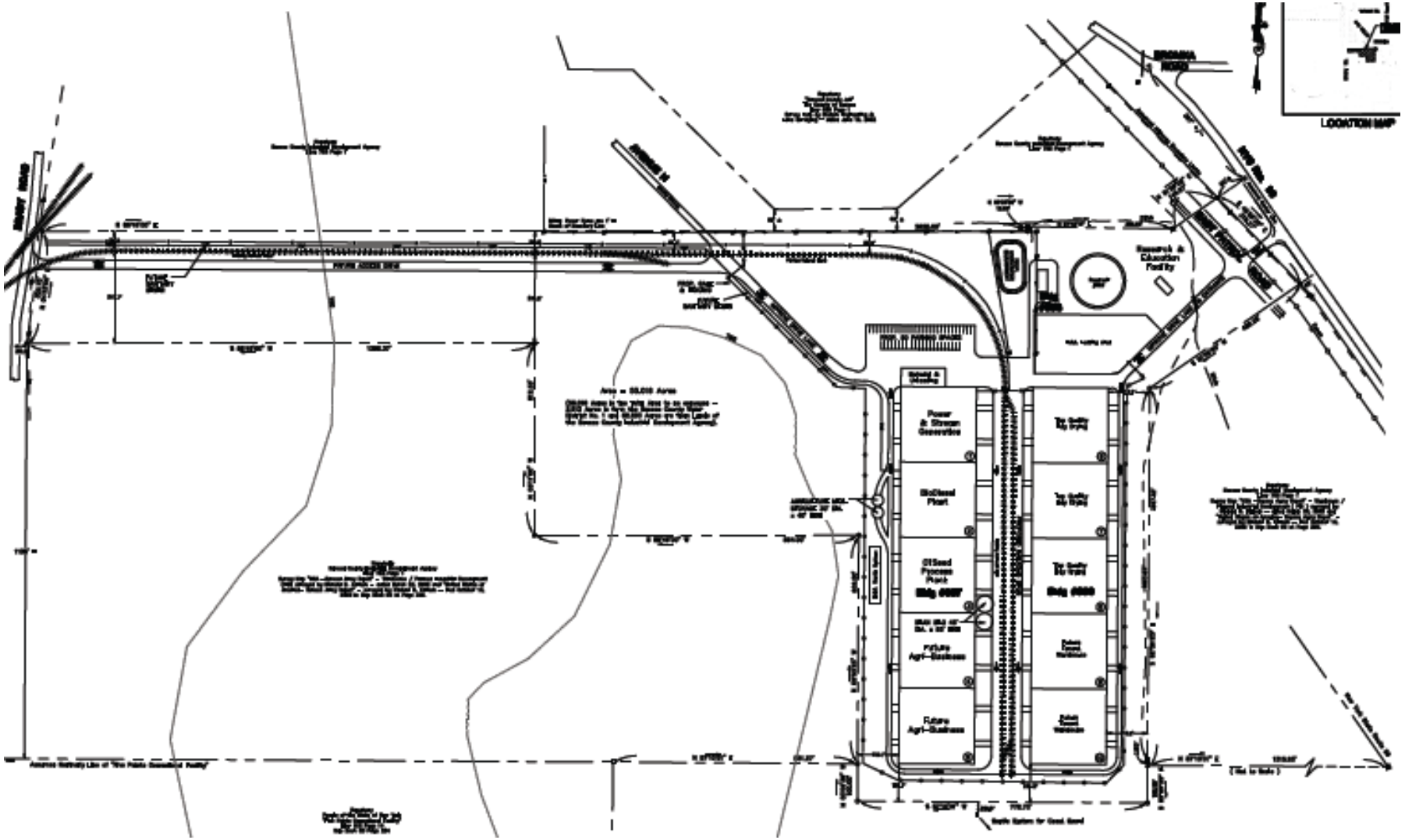
Michael Coia – CEO
William Gray – Business Development Manager
www.senecabioenergy.com

June 2013

Practicing Sustainable Manufacturing Corporate Philosophies

- **Incorporate "Brownfields Redevelopment"**
  - ***Site Selection @ Previous Industrial Facility***
  - ***Infrastructure Rehab – Utilize "Green Practices"***
- **Develop "Green Energy Park" Concept**
  - ***Apply Closed-Loop Utilities & Infrastructure***
  - ***Attract "Like-Minded" Startups – Cost Avoidance***
- **Apply Waste Beneficial Reuse Concepts**
  - ***Regional Wastes – Appropriate Product Feedstocks***
  - ***Manufacture Useful Local "Green Products"***
- **Match "Savor Local" Culture w/ New Products**
  - ***Local Supplies of Biodiesel Biofuels***
  - ***First Finger Lakes Grape Seed Oil***

Seneca AgBio Green Energy Park
Layout of Our 55-Acre Site



Integrated Biorefinery
"Seneca AgBio Green Energy Park"

- **Redevelop Site – Regional Green Energy Park**
  - ***55-Acres – 400,000sf Buildings – Dedicated Rail Service***
  - ***Multiple Renewable Energy and Agri-Businesses***
- **Supports Finger Lakes Regional Agriculture**
  - ***Grape Seed Oil Processing + Wineries Waste Reuse***
  - ***Regional Dairies – Bedding Materials & Dairy Manure***
- **Vertical Integration of Operations**
  - ***Waste Oils Feedstock Processing***
  - ***Biodiesel Production***
- **Attract "Green-Sector Manufacturing"**
  - ***Complimentary Renewable Energy + Agri-Businesses***

Facility Infrastructure Rehab Completed Manufacturing Space Ready for Equipment

Grape Pomace – Organic Waste Repurposing

- **Pomace Processing – *"Grape Seed Separation"***
  - ***Mechanical Processes / Screening Techniques***
  - ***Multiple Wineries - Various Feedstocks***
  - ***Heterogeneous Mixtures & Removal of Wastes***
- **Food Grade Products – *"Natural Products"***
  - ***Grape Seeds Separation & Drying***
  - ***Grape Seed Oil Pressing – Cold Press – Extra Virgin Oils***
  - ***Lightly Filtered Grape Seed Oils – Varietals & Blended***
  - ***Grape Extracts – High-Value Meal + Dried Pomace***
- **Facility Process – *"No Wastes"***
  - ***100% Feedstocks Processed Into Natural Products***
  - ***No Wastes for Disposal***

Winery Grape Press Operations
Waste Pomace Generation and Hauling

Commercial Pomace Deliveries
Truck Loads @ 5-10ton Capacities

Commercial Grape Seed Separation Screening @ 25tph Processing

Grape Seed Operations
Screening / Pressing / Oils & Extract

Cheese Trim Recovery

Dave Fister

New York State Pollution Prevention Institute at RIT

Funding Provided by NYS Department of Environmental Conservation

Cheese Trim

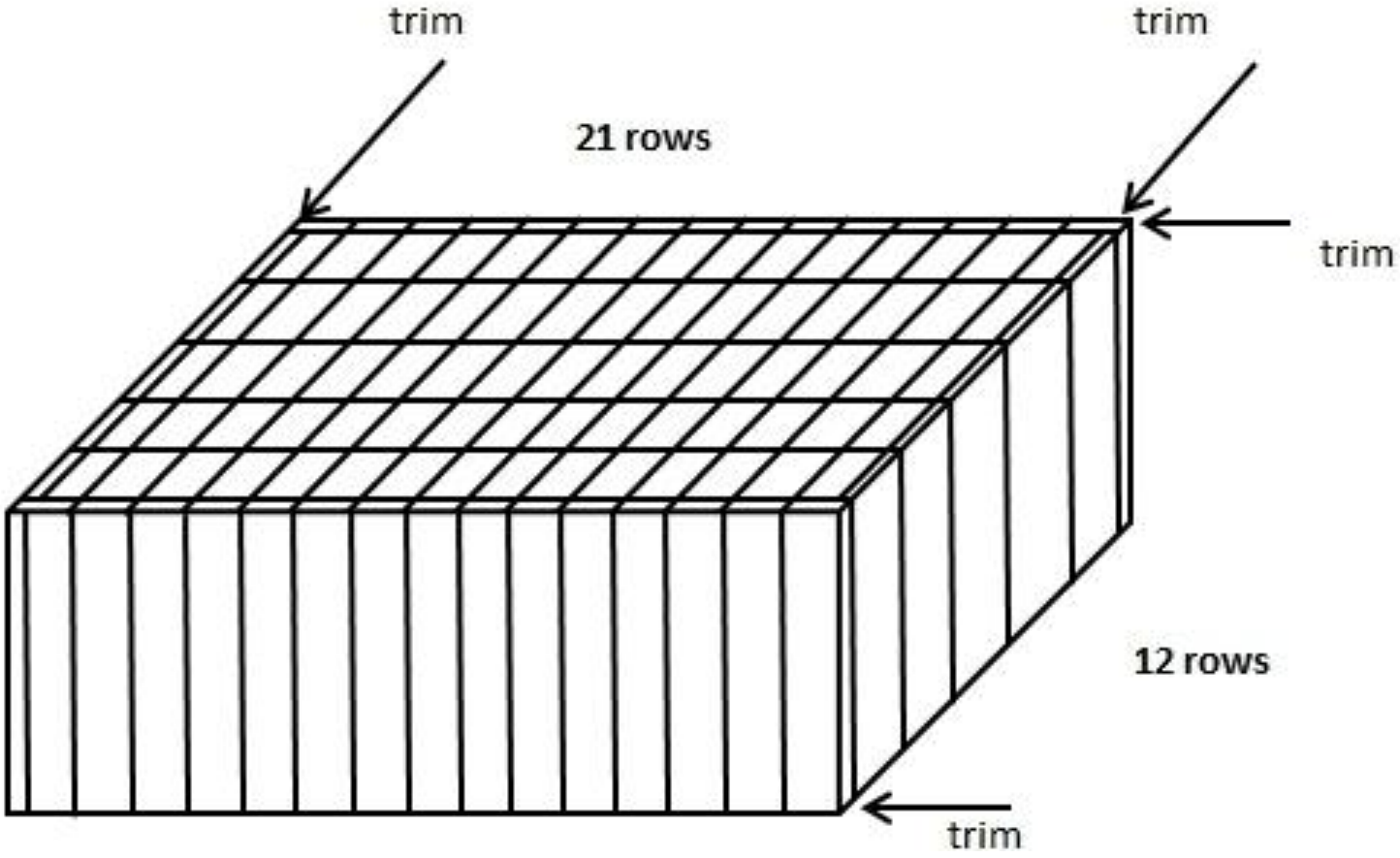
Identified Opportunities:

- Cheese trim losses ranged from 5-10% of the block weight (30-60 lbs per block)
- Sold below cost as trim rather than retail value
- Consists of side and top trim and broken or misshapen bricks of cheese
- Estimated revenue lost per year is

$500,000

Funding Provided by NYS Department of Environmental Conservation

Cheese Trim Locations



Funding Provided by NYS Department of Environmental Conservation

Trim Options

Potential Improvements

1. Reduction in the total trim losses (process optimization)
2. Conversion to other products such as shredded or crumbled cheese
3. Extrusion to convert the trim back to original cheese brick product (8 or 16 oz.)

Funding Provided by NYS Department of Environmental Conservation

Analysis

It was determined, based on cheese weight measurements, that the trim could not be reduced without producing higher weight variation in the final cut pieces.

Floor space limitations and equipment costs did not make it economically feasible to use the trim for other cheese products such as shredded cheese.

Funding Provided by NYS Department of Environmental Conservation

Best Solution

Off-the-shelf equipment available specifically for trim reprocessing (extrusion). Therefore, only a single piece of equipment needed; followed by normal packaging.

Equipment shown is approximately $200,000

Funding Provided by NYS Department of Environmental Conservation

Economics

- Retail losses were ~$500,000
- Equipment cost to reprocess trim ~$200,000
- Simple payback is less than 5 months

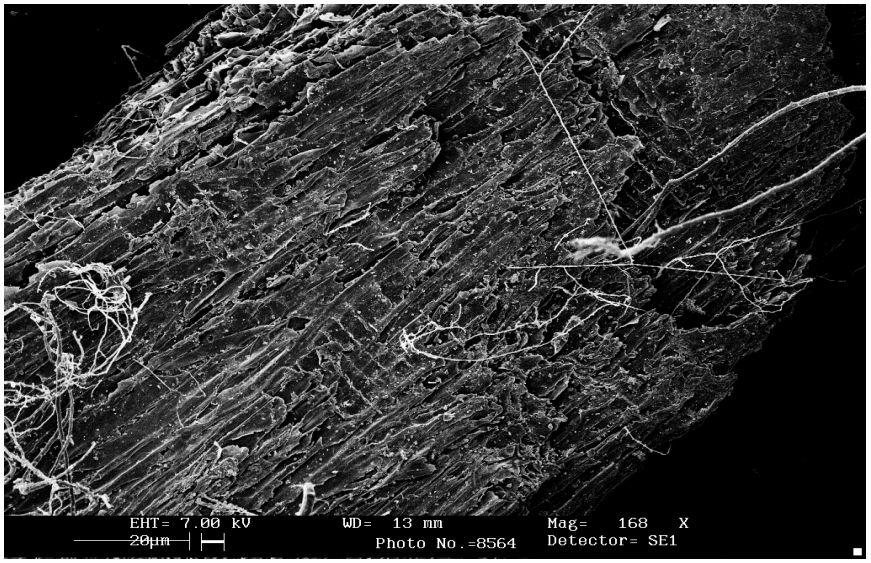
Funding Provided by NYS Department of Environmental Conservation

Current Status

The company is in the process of testing the extrusion equipment with the various cheese types to develop the process parameters.

Funding Provided by NYS Department of Environmental Conservation

Upcycling Organic Waste into Biochar



Biochar: a carbon negative charcoal-like substance with many possible uses:

- Soil Conditioner
- Soil Remediation
- Odor Control
- Compost Accelerator
- Water Filtration

Characteristics of ideal types of waste:

- Uniformity of waste (source separation)
- Moisture content <30%

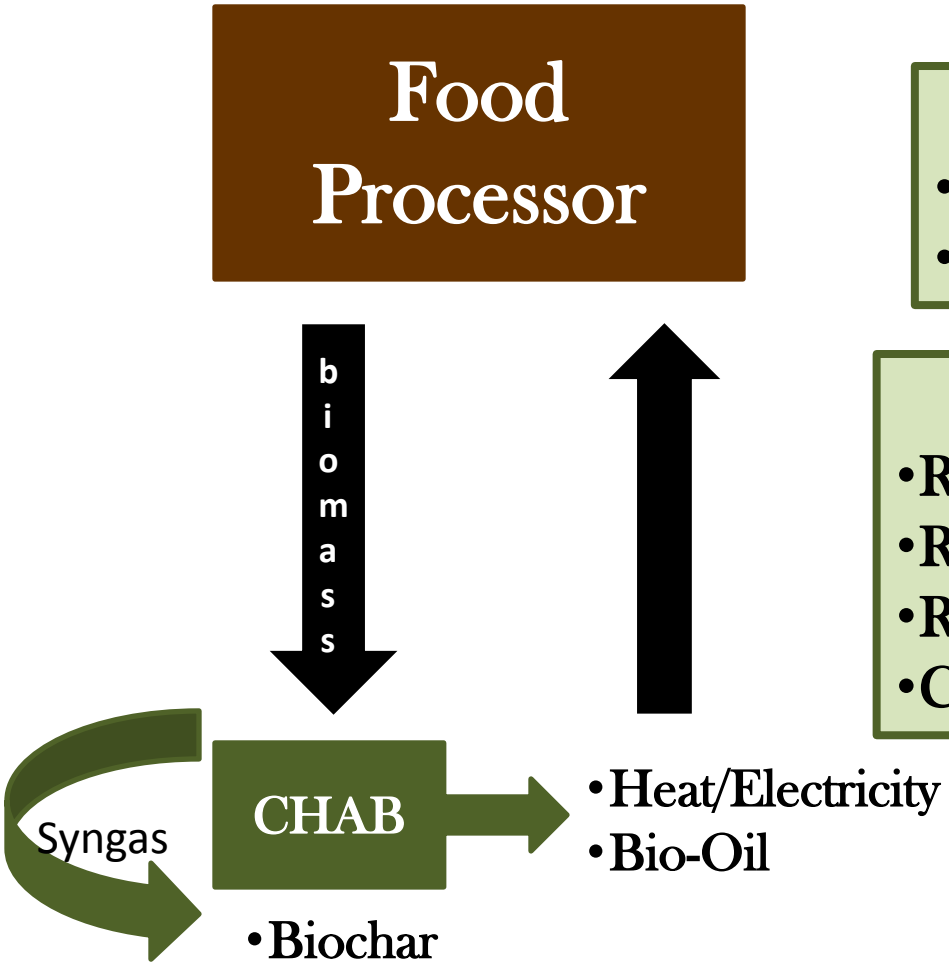
Finger Lakes biochar

Plant Waste Wisely

Current State

- R&D Mode including identification of:
  - Appropriate waste streams
  - Processing requirements, procedures, costs
  - Characteristics of char created from different waste streams
- Exploring closed loop biochar production models with:
  - Food producers: Vineyards, Dairy, Orchards
  - Food processors: Cherry Juice Maker , Coffee Roaster

How can FLB improve Sustainability in Food Processing?



COST SAVINGS

- Reduced Tipping Fees
- Reduced Heating/Electricity Costs

GHG REDUCTIONS

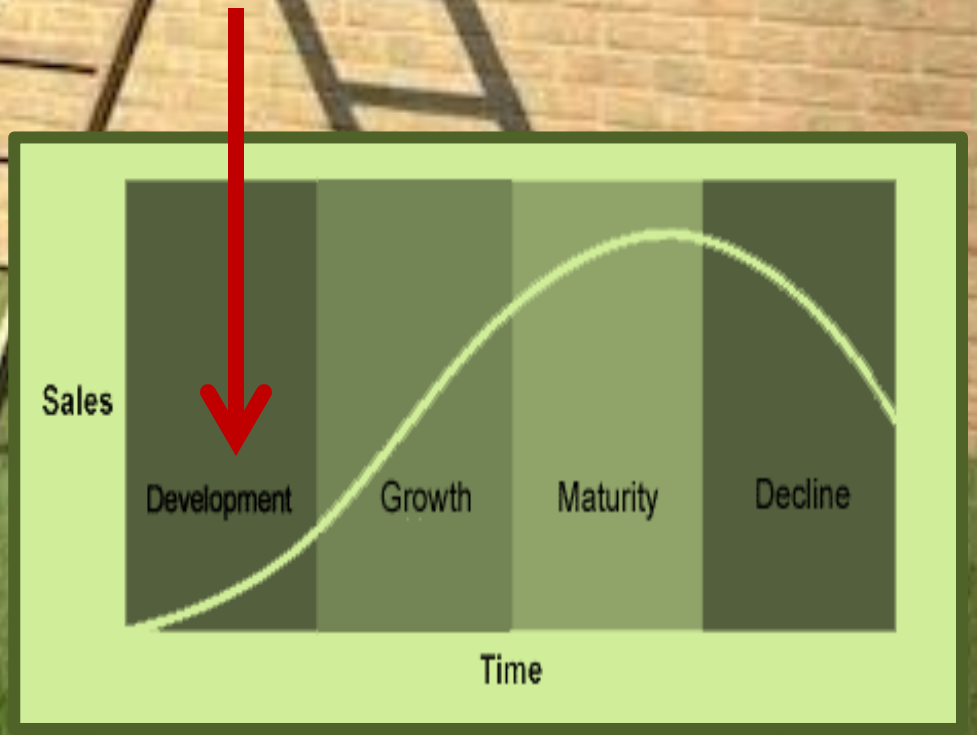
- Reduced Fossil Fuel Usage
- Reduced Transportation of Waste
- Reduced CH4 from Waste @ Landfill
- CO2 sequestration from Biochar

WRE Walker Renewable Energy

Finger Lakes biochar
Plant Waste Wisely

Barriers

- Small scale, decentralized pyrolysis technology which optimizes biochar is still evolving
- Limited market awareness of biochar



Path Forward

Research

- Quantify benefits to food processors
- Assess air quality regulations
- Characterize char from different feedstocks
- Identify best end use for various chars

Demonstration/Pilot Projects

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Panel 2: Water Recovery

Moderator:

Rajiv Ramchandra, NYSP2I

Panelists:

Dennis Burdette, LiDestri Foods

Dr. Eugene Park, NYSP2I – Perry's Ice Cream Case Study

Ron Rausch, Deputy Commissioner, NYS Dept. of Agriculture & Markets

Conserving Water in Food Production

Dennis Burdette
June 18, 2013

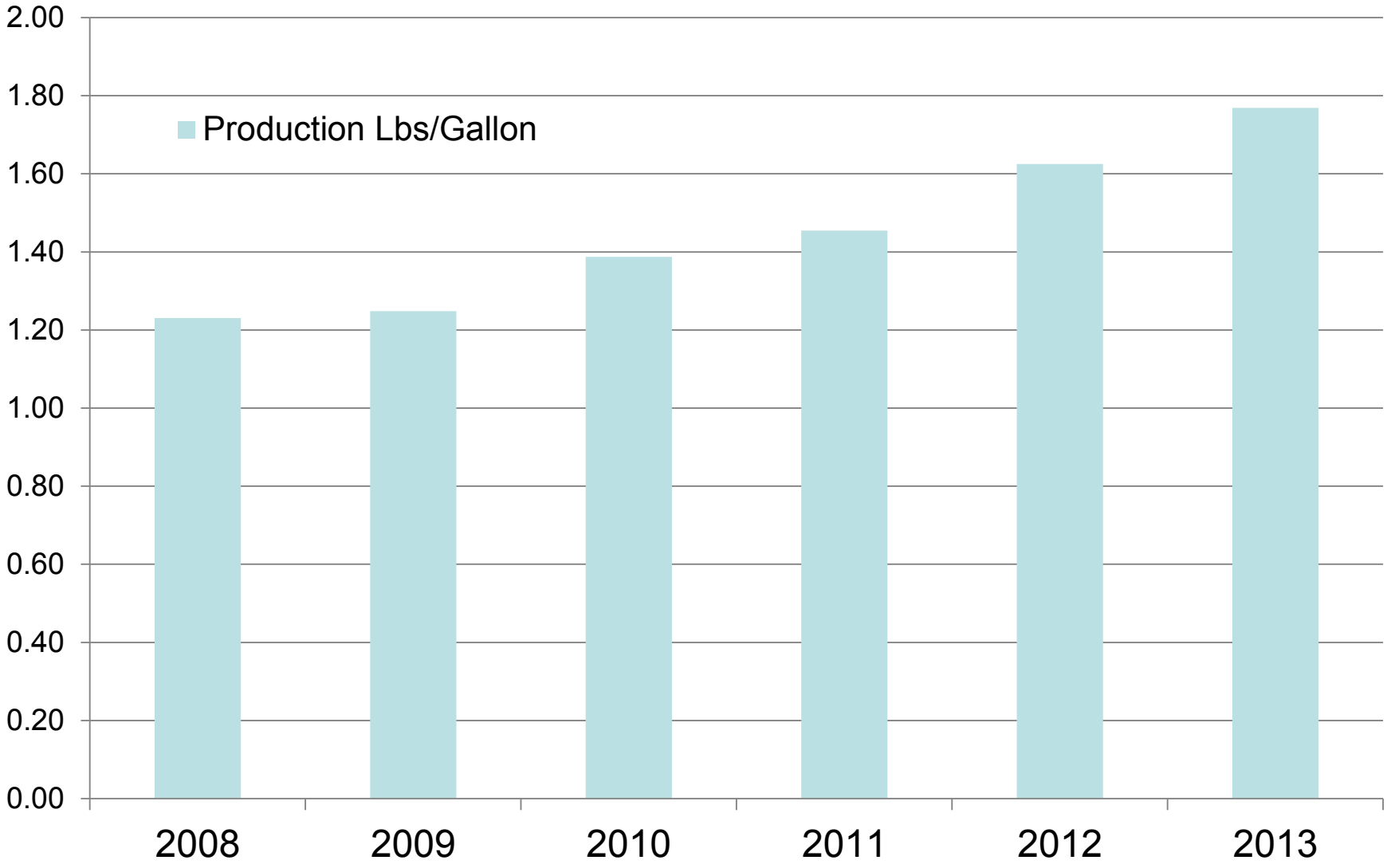
What does LiDestri Foods Make?

- Spaghetti Sauces
- Salsas
- Spirits/Other beverages
- Other Sauces (such as Chinese sauces)

These are made under LiDestri Foods brands or for other companies at six sites.

Water Usage

>5% per year improvement!!!!



Water Use Pareto

In determining how to reduce significant water, a review of our water pareto provides significant insight into our next necessary steps.

Water Usage	% of Water
Sanitary	1.3%
Evaporative Loss	6.0%
Water in Product	5.0%
Water in Waste	0.9%
Landscape Irrigation	0.0%
Retort	26.8%
Hydrocoolers	32.3%
Sanitation	2.2%
Condensate Lost	5.0%
Total	81.4%
Missing	18.6%

Water Usage Goals/Performance

Ultimate Goal 50% reduction by 2014

Annual Goal 2% reduction annually

Simple Statement of Strategy

Two aspects to strategy:

Short – Term Strategy: Procedural adherence

Smaller percent

Associate involvement

Long – Term Strategy: Redesign of process

Larger percent

Capital improvements

These two paths will be presented separately.

Procedural Adherence/Associate Awareness

In the short term, we wanted to get started with our water-reduction efforts. The quickest way was through enhanced associate awareness, and improvement in procedures and adherence to them. Some of the efforts put into place were:

- Spraying Policy
- Monthly Water and Steam Audits
- Water sub-metering
- Daily Measures/Utility Huddles
- Improved Water-Efficient Sanitation
- Associate Awareness/Inter-Plant Sustainability Contest
- Posters/Weekly newsletters
- Associate Leak Detection Emphasis
- Improved Site Communications
- Championship Support System
- Training, including twice annual sustainability review

Longer-Term Strategy

Water reuse, water reuse, water reuse!

The two major users of water are the hyrdro-cooler and retort operations.

Water reuse for Lee Road hydro-cooler use is in place.

Our Fresno plant reuses water slightly, but a broad plan for the reuse of water, especially for retorts and hyrdro-coolers, is on the books…implementation in 2014.

Product Water Footprint

Metric(s) that quantify the potential environmental impacts related to water (ISO/ID 14046). **Products, Processes, Organization.**

INPUT
-water
-energy
-material

CROP GROTWTH

Raw Material processing

Life Cycle approach

OUTPUT:
-water
-emissions

Production Processes

Packaging

Perry's Ice Cream

Akron, NY

Water Reclamation Project

2013

Project Background & Goals

- Perry's seeking to become more sustainable by relying less on natural resources and reducing impacts on the environment
- **Water** seen as one area where improvements can be made
- Reducing water purchase and discharge of dairy process wastewater became primary focus through in-process recycling of potable water

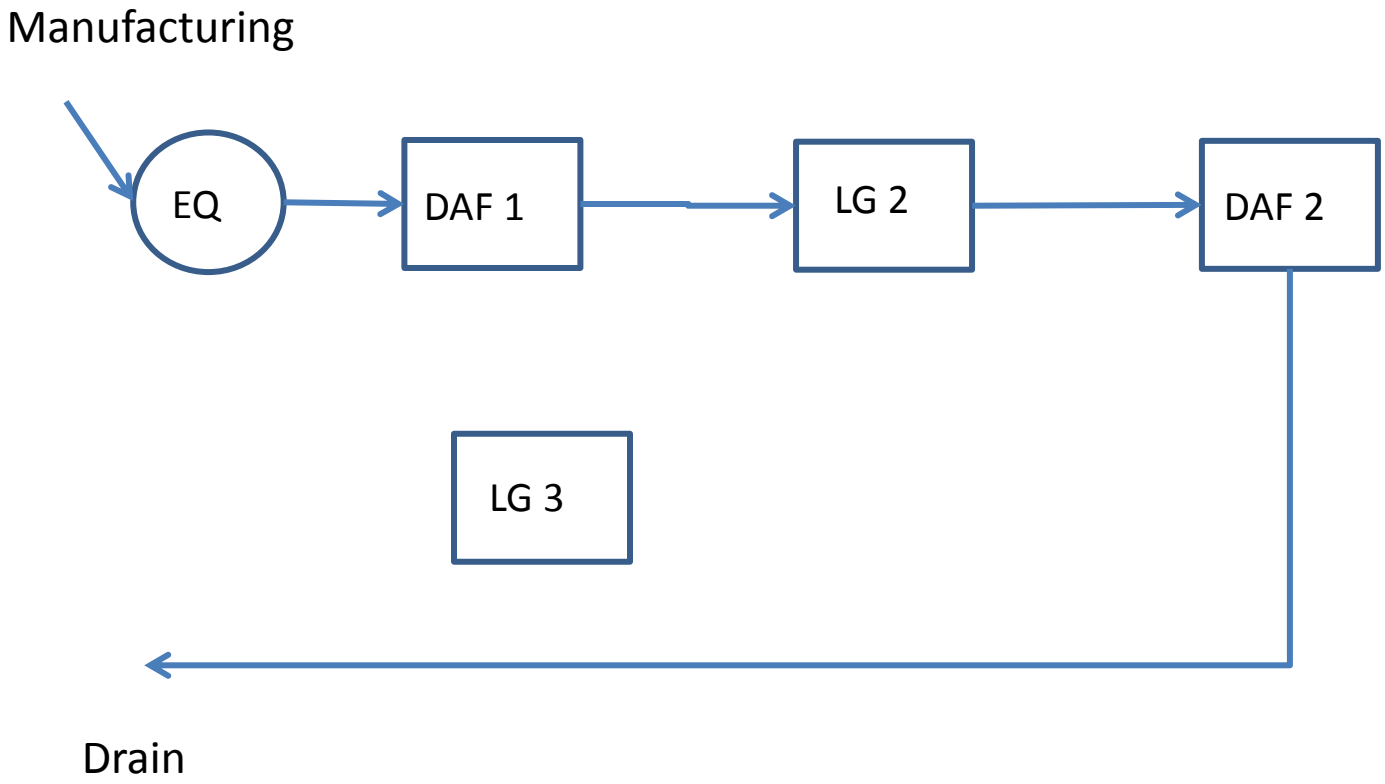
Project Background & Goals, cont

- Initial pilot studies with reverse osmosis (RO) indicated feasibility
  - But closer analysis of application revealed higher than expected capital and operating costs
  - Also quality of RO water might be “too clean” for equipment cleaning (CIP) applications
- Current system produces relatively clean water
- Decided to evaluate a simpler system using multi-media filtration (MMF), activated carbon (GAC), and chlorine (if necessary)

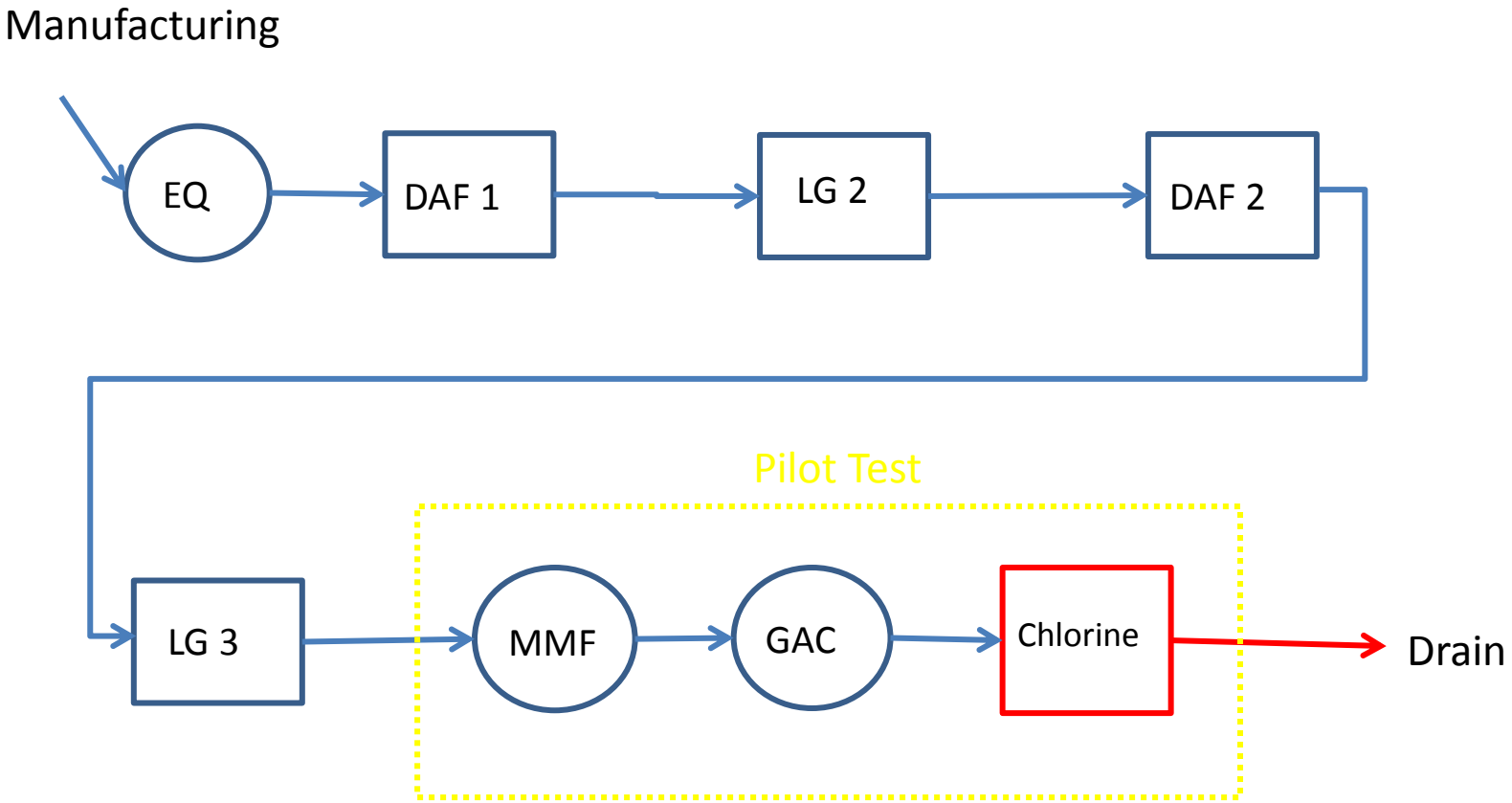
Waste Water Pre-Treatment

- Maximum Capacity 120,000 GPD
- Discharge Limits BOD & TSS 250 mg/L
- Nominal Discharge Conditions
  - 60,000 GPD
  - BOD & TSS: “Double Digits or Less” mg/L
  - Close to direct discharge concentrations (SPDES)

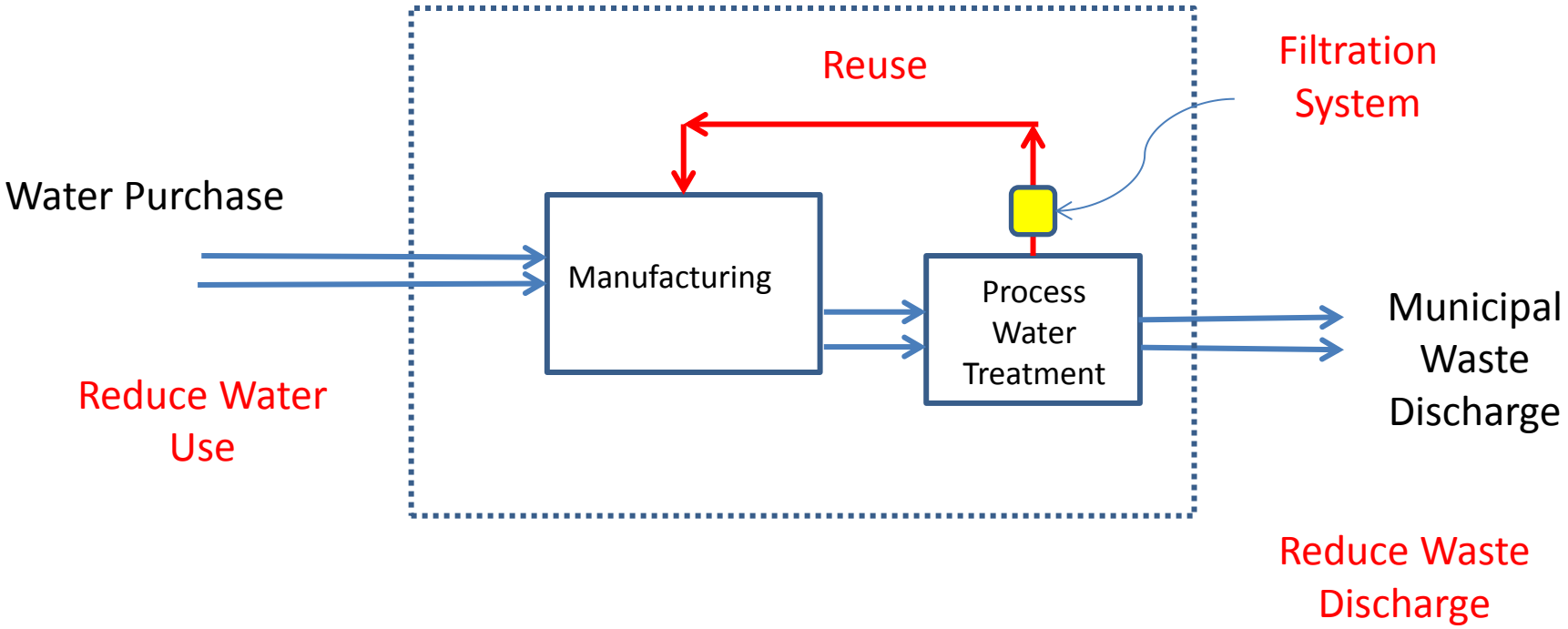
Current System



Pilot Test Set Up



Reduction Goals



GAC & MM Filters

Pilot Considerations

- One Month Test (2X turnover)
- Effluent Quality
- Allergens/Virus/Bacteria
- Sampling & Analysis
- Cost & Technical Design Basis
- Operations
- Regulatory

Moving your project forward

Ron Rausch
Deputy Commissioner
NYS Dept. of Agriculture & Markets

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Panel 3: Food Waste to Energy

Moderator:

Dr. Tom Trabold, Golisano Institute for Sustainability

Panelists:

Bill Gray, Seneca Bioenergy

John Noble, Synergy Biogas

Graham Fennie, Epiphergy

Food Waste To Energy – Sustainable Manufacturing Operations

- **Develop Products that Create Value from Wastes**
- **Reduce Ultimate Wastes**
- **Create A Series of Value-Added Products**
  - ***Waste Oils – Biodiesel***
  - ***Farm Fiber & Short Fiber Paper Pulp – Agri-Products***
  - ***Food Waste Processing – Recyclables & Electricity***
  - ***Food Grade Dehydration – High Value Grain Feedstocks***
- **Capture the "Value Pyramid"**
  - ***Low-Value Agricultural Products $***
  - ***Medium-Value Feed Products $$***
  - ***High-Value Food-Grade Products $$$***

Requirements – Multiple Operations Common Infrastructure

- **All Operations Require "Feedstocks"**
- **Synergies of Incoming Wastes – Agri & Food**
- **Operations Utilize Common Materials Handling**
  - ***Receiving Systems – Rail /Truck /Storage /Conveyance***
  - ***Processing Systems – Storage Tanks /Truck Scale***
- **All Operations Require "Utilities Infrastructure"**
  - ***AgBio Park – Plans for Synergistic Cluster of Processes***
  - ***Expanded Electric Service***
  - ***Expanded Natural Gas Service***
  - ***Future Expansion – Biomass Combustion***
  - ***Future Expansion – Anaerobic Digestion & Electric***

Waste Vegetable Oils Biodiesel Production Commercial Operations

- **Expand Upon Previous Pilot-Scale Testing 2011**
- **System Construction & Contracting Feedstocks**
- **2013 Activities**
  - ***Receiving Systems – Rail /Truck /Storage***
  - ***Processing Systems – Design/Build Contract***
  - ***B100 Biodiesel Production – 1000 gallons per shift***
- **Biodiesel Customers**
  - ***Local School Bus Fleets***
  - ***Regional Finger Lakes Railroad***
  - ***Local Bioheat Suppliers***
  - ***Local Agri-Businesses***

Commercial Biodiesel Construction
Prepping for Large-Capacity Biodiesel

Agricultural Wastes Processing Operations
Thermal Dehydration

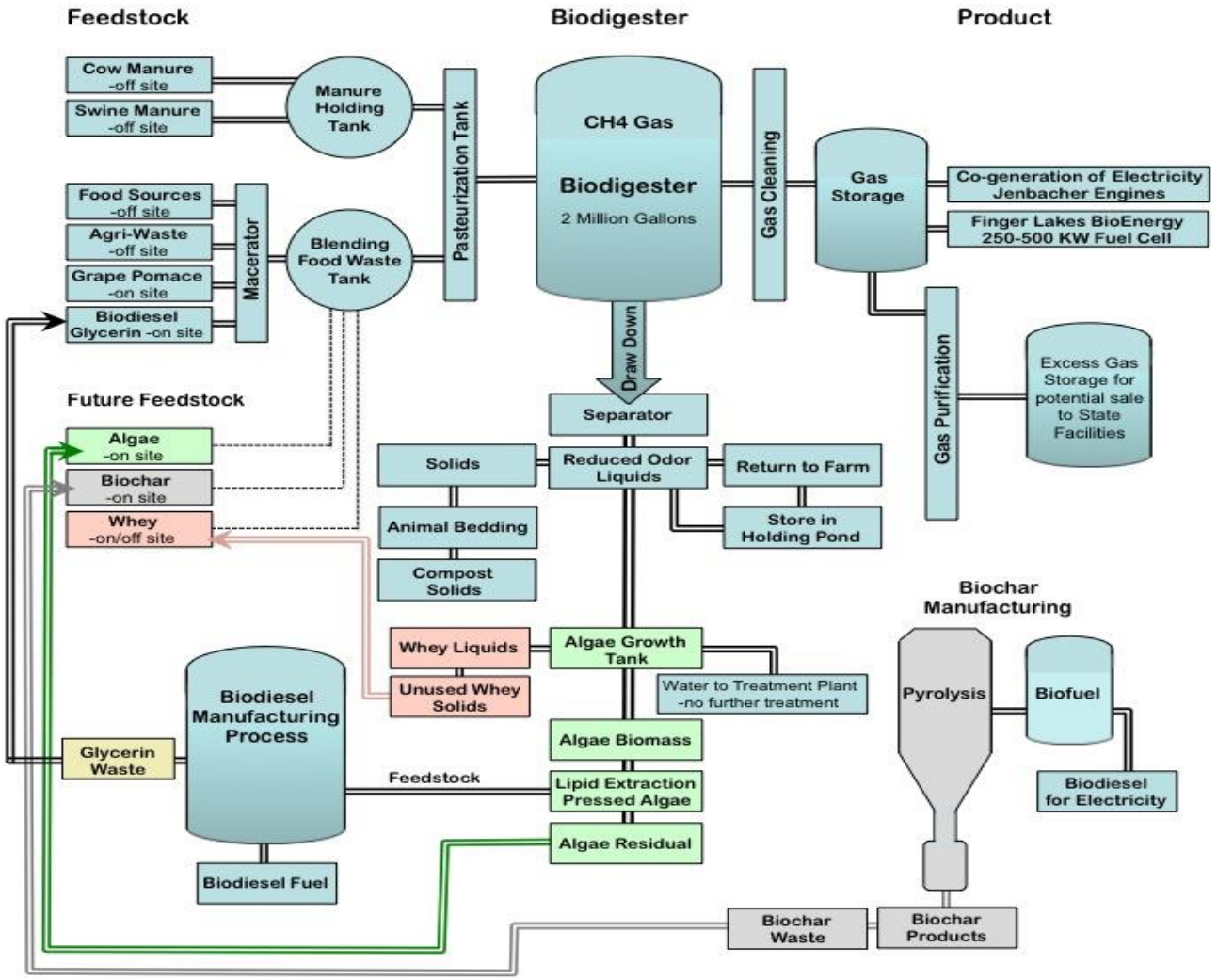
- **2012 Pilot Drying Operations**
  - ***Short Fiber Paper Pulp – Drying 70% Moisture***
  - ***Processing for Bovine Bedding Products – 30% M***
- **2013 Toll Operations**
  - ***Paper Pulp Dehydration – Commercial Blending & Sales***
  - ***Farm Fiber Dehydration – Process & Tenant Blending***
  - ***Processing Other Waste Feedstocks – Ingredients***
- **Planned Food-Grade Dehydration**
  - ***Stainless Steel Rotary Drum Dryer + Roaster Polishing***
  - ***High-Value Grain Dehydration***
  - ***Multiple Tenants for Process & Warehousing Storage***

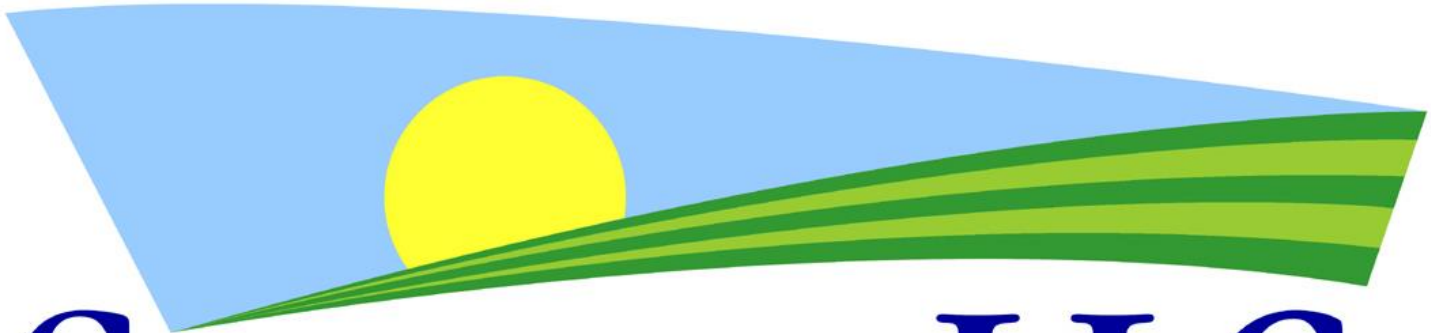
Agricultural Dehydration
Paper Pulp & Farm Fiber Toll Operations

Food and Dairy Wastes ADG
Planned Expansion Commercial Operations

- **Recently Awarded NYSERDA Capital Grant**
- **Mixed Wastes ADG System – Electric + Products**
- **Planned Activities**
  - ***Receiving Multiple Wastes – Rail /Truck /Storage***
  - ***Processing Systems – Wastes /Recyclables / ADG***
  - ***Products Planned – Electric / Farm Fiber / Digestate***
- **Linkages**
  - ***RIT Collaboration with Treatability Testing***
  - ***Multiple Food Wastes Contracts + Dairy Wastes***
  - ***Ongoing Design/Build ADG Vendors Negotiations***
  - ***Construction & Operations in 2014***

Planned Seneca AgBio ADG System





Synergy: *is the creation of a whole which is greater than the sum of its parts.*

By bringing together the strengths and complementary nature of large-scale dairy and field crop businesses, Synergy captures efficiencies in management, human resources, and the utilization of capital assets.

Currently, Synergy is comprised of a 1,900 cow dairy farm located on 750 acres in Covington, NY.

WE'RE IN THE DAIRY BUSINESS

As farmers we care:

about our local neighbors and economy
about our cows
about our quality
about our employees
about our consumers
about our environment

On Farm Digester

Synergy Anaerobic Digester processes 100,000 gallons per day of manure, food grade and organic waste.

8 tractor-trailer loads/day


07.03.2012

On Farm Anaerobic co-digestion:

Multiple economic and environmental benefits

Manure management and disposal

- reduces odors
- decrease greenhouse gas emissions – 7000 tons CO2/year
- improves nutrient management and water/air quality
- generates livestock bedding

Food waste disposal

- additional farm revenue source
- another "synergy": Utilization of food wastes that could otherwise go to landfill or POTW

Energy production

- Jenbacher J420 engine: generates 1.4 megawatts
- estimated to power 1000 homes
- Displace fossil natural gas to produce renewable electricity

Job creation

Technology Implementation

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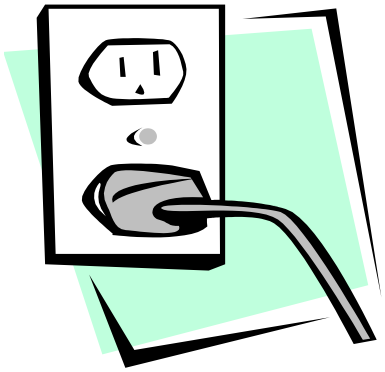
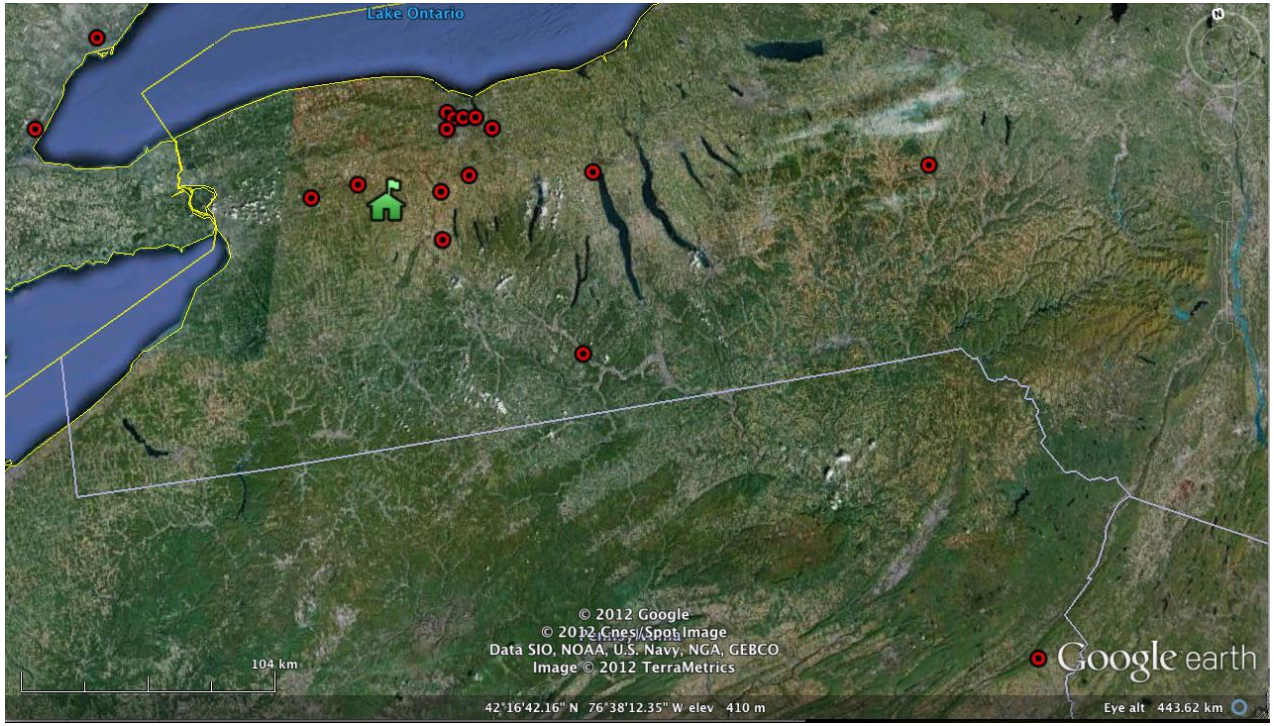


Technology Benefits

Synergy Anaerobic Digester is now running at or near a 95% capacity factor

- Annual “green” electricity production of 11,650 MWh
- Based on analysis conducted by RIT, assuming non-baseload power in the upstate New York region, this enables reduction of nearly 7000 metric tons of greenhouse gas emissions
- This benefit is realized even when transporting food waste from as far as 264 miles (Wind Gap, PA)



Food Waste Inputs to Synergy Anaerobic Digester

Assumptions

- 1-way driving route
- no combined trips
- vehicle types and fuel efficiency

Waste Source Location	Feedstock Category	One-way Distance (mi)	# of Trips	Total Distance Traveled
Burlington, ON	Pig Slaughterhouse Waste	121	115	27,726
Mount Morris, NY	Agricultural Wastes	22	76	3,306
Avon, NY	Whey DAF Effluent	21	184	7,775
Rochester, NY	Bakery Waste	34	155	10,594
Rochester, NY	Grease Trap Waste	39	62	4,777
Rochester, NY	Grease Trap Waste	45	95	8,500
Fairport, NY	Tomato Products	48	15	1,454
Campbell, NY	Cheese / Whey Waste	73	12	1,745
Wind Gap, PA	Biodiesel Derived Glycerol	264	50	26,408
Toronto, ON	Pork / Bakery Waste	153	3	917
Rochester, NY	Bakery Waste	41	2	164
New Berline, NY	Yogurt Waste	189	9	3,402
Batavia, NY	Dairy Waste	15	40	1,192
Rochester, NY	Grease Trap Waste	40	11	869
Honeoye Falls, NY	Bakery Waste	30	1	60
Geneva, NY	Grease Trap Waste	75	1	150
Corfu, NY	Cheese Waste	26	4	206

Total Hauling Distance = 99,245 miles

* Includes data from 1/1/12 – 12/10/12

Barriers

Permit Process –

numbers, scope, variety of state and federal agencies involved

Utility Companies –

Age of infrastructure and interconnection issues

Control of rate structure

Fees

Access to Capital –

Need for Scale/Size of Projects for ROI -

Outdated Federal and State Energy Policy –

Under current conditions:

Value of electricity isn't enough to keep a digester viable.

Selling composted solids and selling or utilizing waste heat are also vital to a healthy bottom line.

Path Forward

Synergy LLC
DAIRY PRODUCTION PARTNERS

Convergence of the agriculture, livestock, waste management and organics recycling sectors.

Larger community based anaerobic digesters.

Anaerobic digestion is an opportunity to meet our combined goals:

- greenhouse gas reduction
- green energy production
- improved waste management
- building a supply chain that's more sustainable
- providing a home for the organics waste stream

It is definitely moving beyond just an idea at the farmer level.

epiphergy

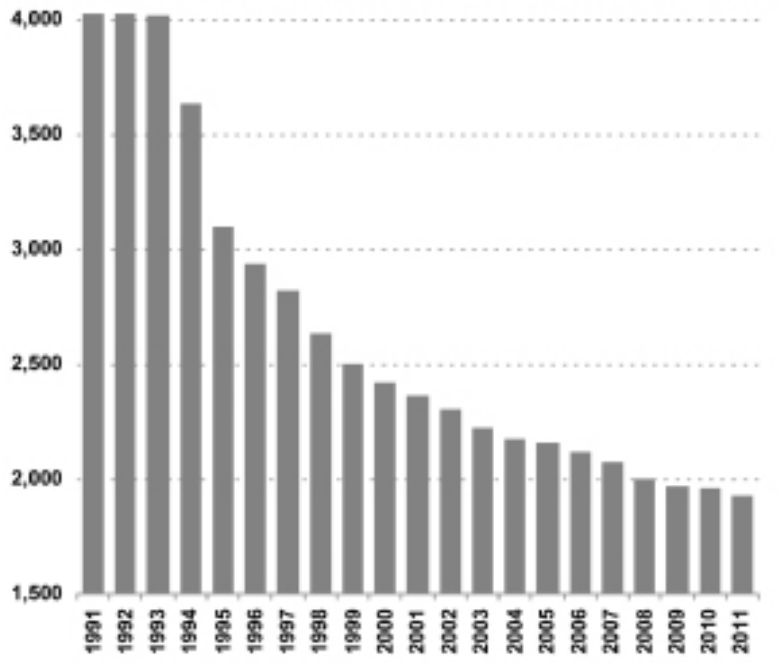
Sustainability in Food Processing

“Waste to energy… and more”

June, 2013

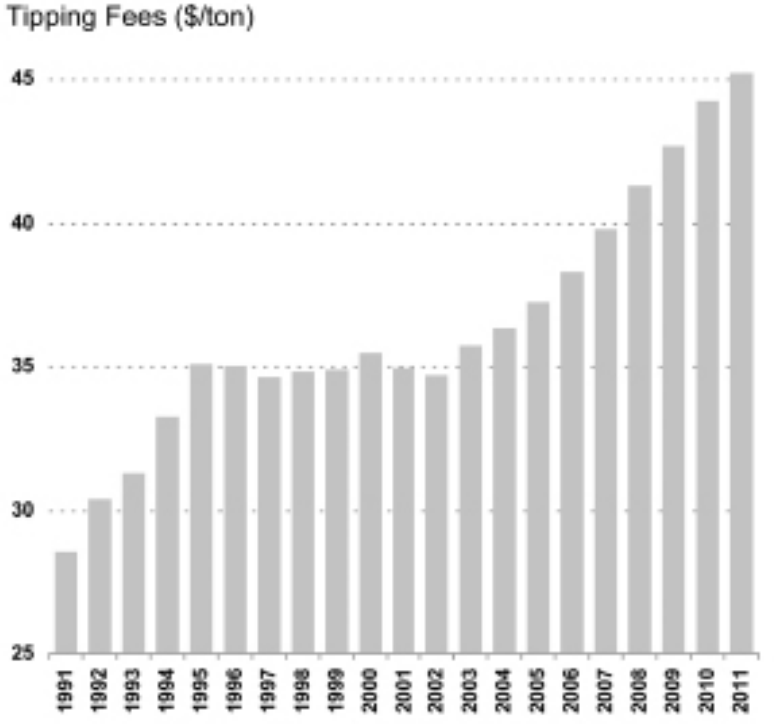
Fewer Options = Higher Costs

Active U.S. Landfills Accepting MSW



Source: Waste Business Journal, August 2011

Average U.S. Tipping Fees



Source: Waste Business Journal, August 2011

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MSW Composition & Recycling Rates

	Millions of Short Tons			Percentage	
	Generated	Recycled	Landfilled	Recycle %	Landfill %
Paper & Paperboard	68.43	42.50	25.93	62.1%	37.9%
Glass	11.78	3.00	8.78	25.5%	74.5%
Metals	20.91	7.22	13.69		
Steel	15.62	5.23	10.39	33.5%	66.5%
Aluminum	3.40	0.69	2.71	20.3%	79.7%
Other Metals	1.89	1.30	0.59	68.8%	31.2%
Plastics	29.83	2.12	27.71	7.1%	92.9%
Rubber & Leather	7.49	1.07	6.42	14.3%	85.7%
Textiles	12.73	1.90	10.83	14.9%	85.1%
Wood	15.84	2.23	13.61	14.1%	85.9%
Other Product Waste	4.64	1.23	3.41	26.5%	73.5%
Food Waste	34.29	0.85	33.44	2.5%	97.5%
Yard Trimmings	33.20	19.90	13.30	59.9%	40.1%
Misc. Inorganic Waste	3.82	0.00	3.82	0.0%	100.0%
SubTotal	**263.87**	**89.24**	**174.63**	**33.8%**	**66.2%**

Food Waste recycling challenges have not been adequately addressed to date.

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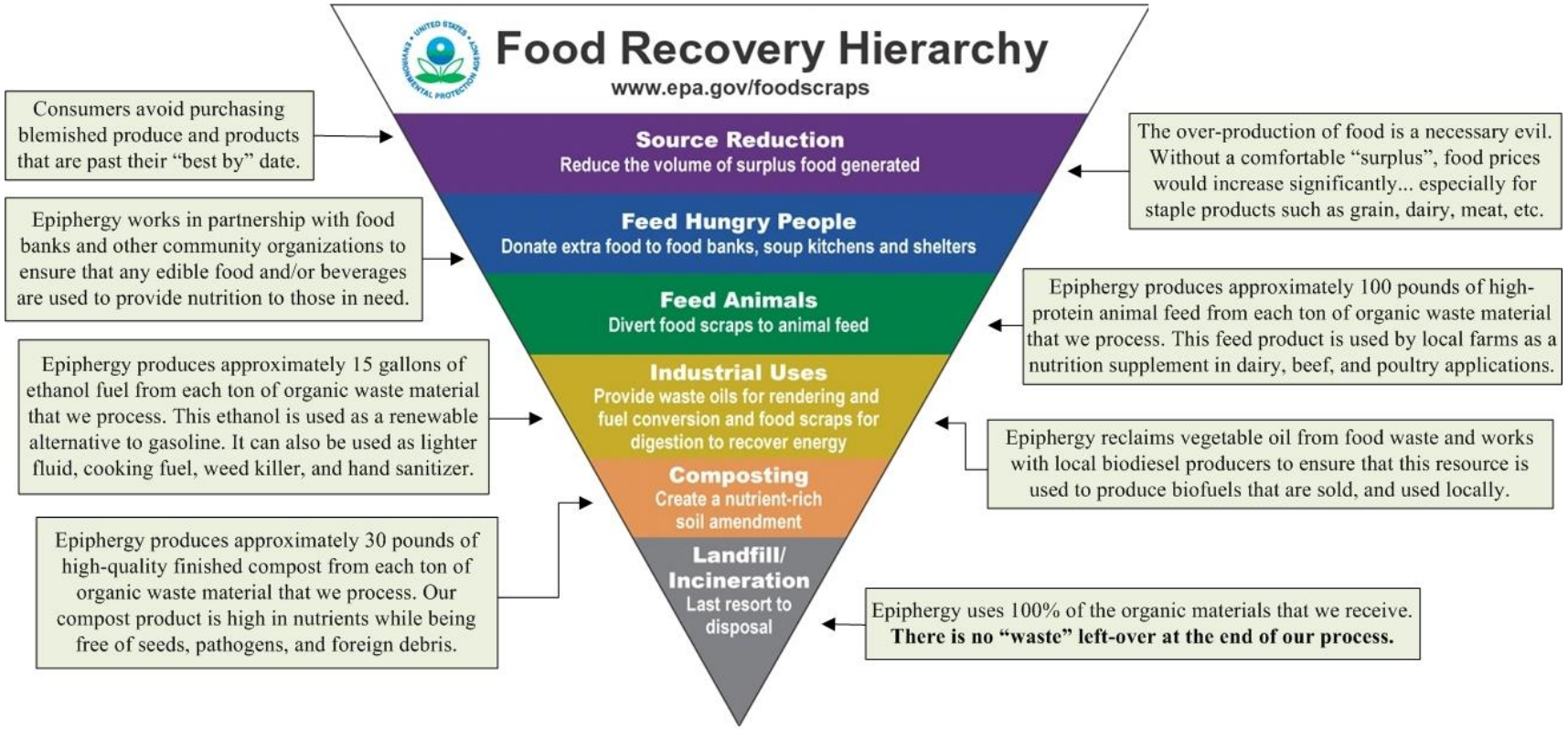
Maximizing Value



Epiphergy follows the Food Recovery Hierarchy by finding highest and best uses.

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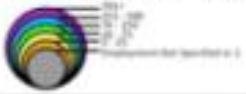
WNY Food Processing Operations

Batavia, NY /
Genesee Valley Agri-Business Park

Legend

Major Highway
County
Highway
State
Urban Area
Western New York Region

Food Processing Operations; By Employees



Data Source: Hoovers, Inc a D&B Product
Not 100% coverage of all food processing operations
Some operations do not report local employment
NAICS Codes: 31122-3119, 3121

Total operations: 670

Total employment: 18,732*

(*For firms with employment provided)

Local Operations

Constellation · Sorrento Cheese · Cott · Tyson · Mott's · Nestlé · kraft foods · North American Breweries · PBG · Rich's · Seneca

Sample of larger employers

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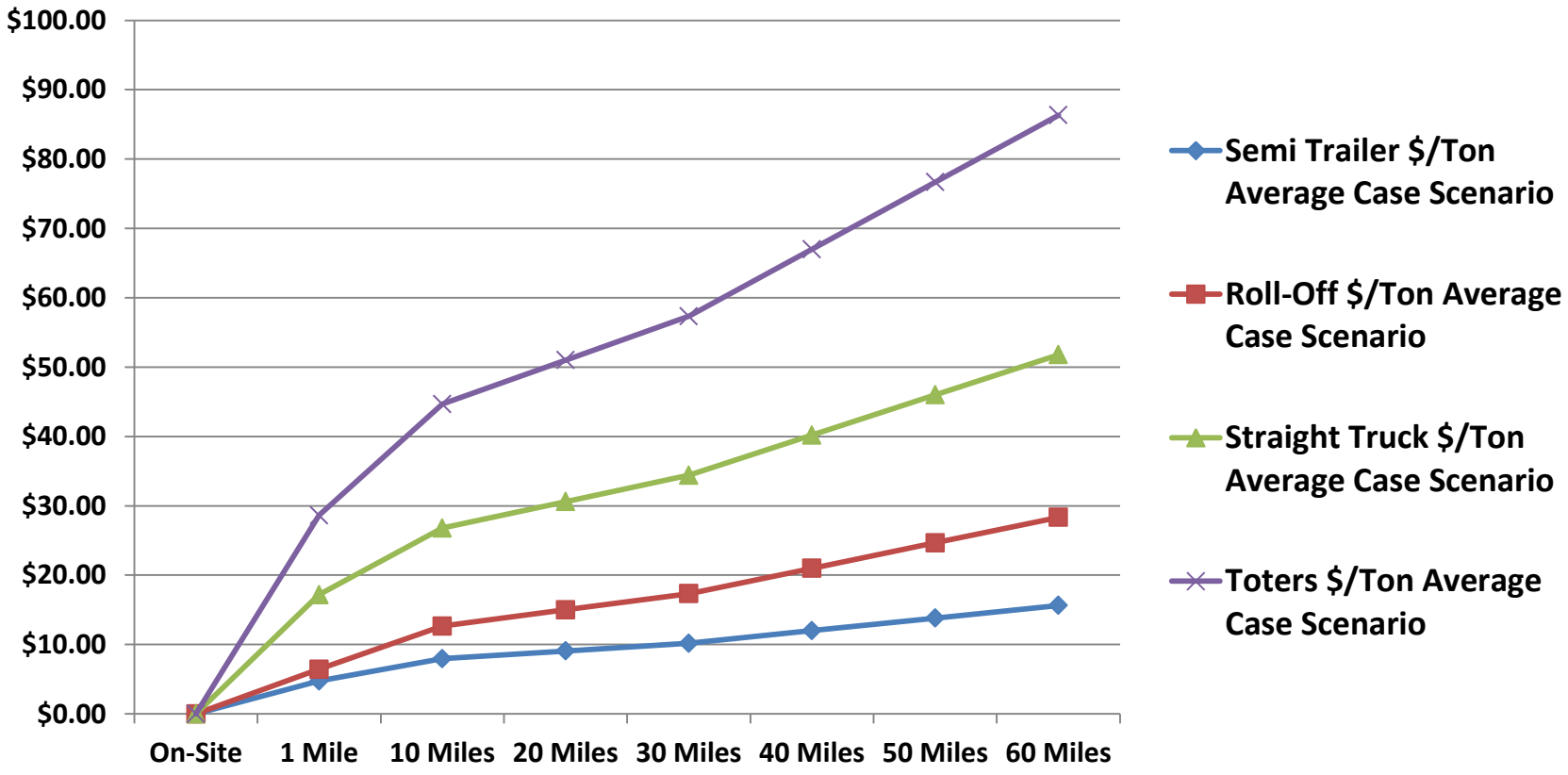
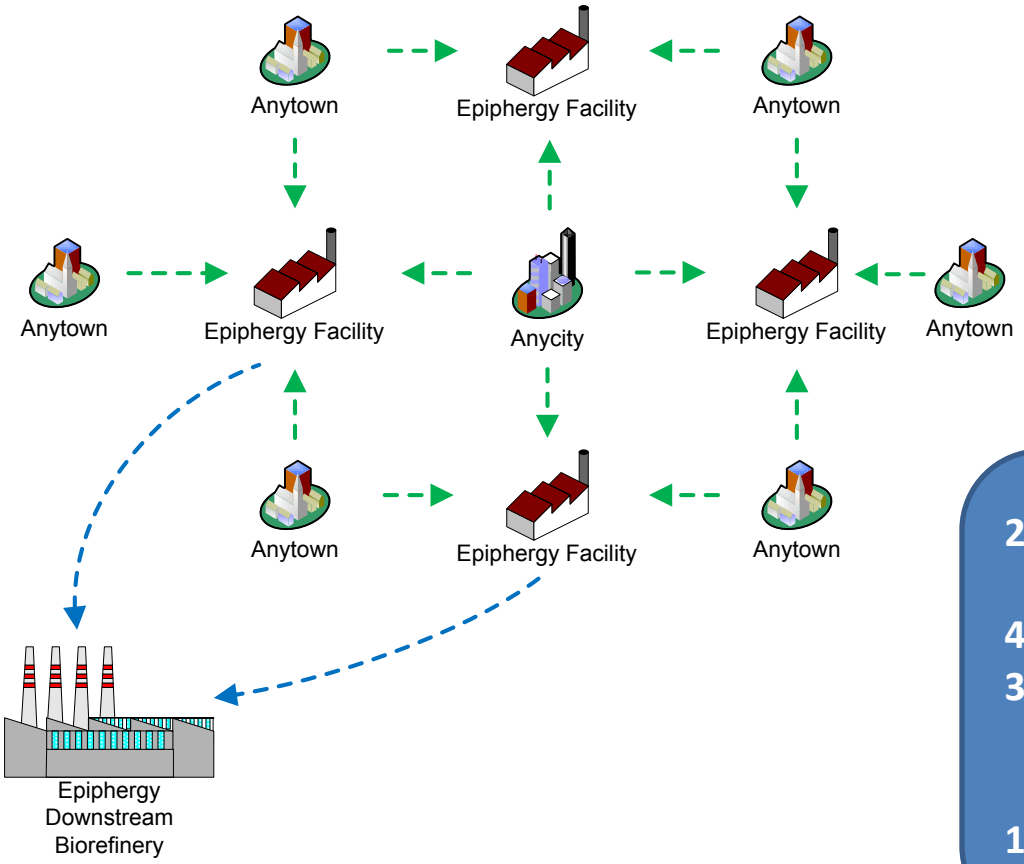
Waste Transport Cost



Vehicle/method, transport distance, and collection frequency ALL effect transport costs.

Distributed Bioprocessing

Greatly reduces transportation distance and cost for both waste and products.



2,000# of Organic Waste IN becomes:

400# Ethanol (to biorefinery)
300# Animal Feed (to farm)
50# Compost (to farm)

1,250# Pre-Treated Wastewater OUT

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More than energy…

1. Minimize the costs of organic waste “disposal”:
   a) Maximize value creation
   b) Minimize the cost of waste processing
   c) Accept the widest possible range of materials

2. Minimize the cost of organic waste collection & transportation:
   a) Minimize transportation distance
   b) Minimize mass/volume of waste material
   c) Minimize the frequency of waste pick-ups

3. Sustainability Considerations:

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How To Get Started and Available Programs

NYSP2I Direct Client Assistance Program – Dr. Gene Park, NYSP2I

NYSP2I Sustainable Supply Chain Program - Patricia Donohue, NYSP2I

NYSP2I Green Technology Accelerator Center – Dan Smith, CIMS/NYSP2I

NYSERDA/EDGE Program – Haley Rotter and Ana Liss, Greater Rochester Enterprise

Direct Client Assistance Program

NYSP2I works with New York State companies to develop cost-effective and environmentally preferable solutions.

Program Benefits

- Reduced costs through:
  - Efficient resource utilization
  - Reduction or elimination of waste generation, disposal and/or regulatory fees
- Innovative engineering solutions
- Reduced environmental impact
- Competitive positioning as an environmentally conscious business

Sustainable Supply Chain & Technology Program

Positions New York State manufacturers to take advantage of global sustainable manufacturing and green supply chain opportunities

The Sustainable Supply Chain & Technology Program provides:

- ✓ Sustainable manufacturing assessment and implementation assistance
- ✓ Marketing and awareness in the green marketplace for NYS manufacturing companies meeting environmental standards
- ✓ Information regarding non-regulatory, voluntary standards and certification requirements necessary to enter new and emerging "green" markets via a user-friendly website (currently under development)

Completed Sustainable Supply Chain Project

Business

- Food Manufacturer

Activity

- NYSP2I conducted a gap assessment and provided recommendations to enable company to answer and achieve higher scores on customer Supply Chain Scorecards

Expected Outcome

- Company will remain a supplier to their key local and global customers while ***making continuous improvements towards their environmental impacts*** and becoming a more sustainable supplier

Metrics

- Company expects to retain 213 employees and potentially add one job

Green Technology Accelerator Center

The Green Technology Accelerator Center *(GTAC)* program at NYSP2I helps companies **accelerate their introduction of green technologies** into the market. New York State companies can take advantage of **emerging market opportunities** for environmentally preferable products by receiving assistance in a variety of areas.

The Green Technology Accelerator Center Provides:

- ✓ Support to both **start-up companies and established organizations** in their effort to develop and market **product offerings utilizing green technologies**

- ✓ **Technical development assistance** by **leveraging an existing network** of innovation resources including state-of-the-art **NYS University facilities** and **Regional Technical Development Centers (RTDC)**

  - **Rochester Institute of Technology**
  - **Rensselaer Polytechnic Institute**
  - **University of Buffalo (SUNY)**
  - **Clarkson University**

Green Technology Accelerator Center

Program Status

Since GTAC program's inception in 2011:

- NYSP2I has **screened 55** companies for potential acceptance
- Of these 55**,** NYSP2I has identified **18** qualifying projects
- NYSP2I has **completed 4 projects** with **7 projects active** as of June 2013

GTAC Project - Examples

Food Processing Equipment

Business

- Food Safety Equip. Manufacturer

Activity

- NYSP2I provided product energy evaluation of cider pasteurization

Expected Outcome

- 99% less energy consumed per gallon of cider processed

Metrics

- Company expects to **retain 1** employees and potentially **add 1-2 jobs**

Sustainable Packaging

Business

- Agri-based packaging material

Activity

- NYSP2I supported manufacturing process optimization with Life Cycle Assessment techniques

Expected Outcome

- Decreasing environmental footprint with manufacturing process optimization

Metrics

- Company expects to **retain 46** employees and potentially **add 14 jobs**

Food Waste to Bio-Fuel

Business

- Food Waste to Ethanol & Compost

Activity

- NYSP2I provided process mapping and environmental impact analysis

Expected Outcome

- GHG reduction of >500% compared to corn-based ethanol

Metrics

- Company expects to **retain 5** employees and potentially **add 40 jobs**

nyserda
Energy. Innovation. Solutions.

“EDGE” Program

WHAT IS “EDGE”?

Economic Development Growth Extension
Building Community Support for Energy Projects

- **Matching energy projects to available $$$**
- **Creating partnerships to encourage the implementation of projects that spur job growth and investment**
- **Assisting with the *Consolidated Funding Application***
- **Educating Business Owners, Community Leaders & the public on the benefits of energy efficiency & renewable energy**
- **Assisting energy-related businesses and entrepreneurs access NYSERDA funding**

NYSERDA EDGE Activities

- Working with community partners to identify projects in the Finger Lakes region
  - County IDAs, Chambers of Commerce, Rotary, Real Estate, Trade Associations, etc.
- Supporting the efforts of the FL-REDC, including the implementation of the "*Regional Sustainability Plan"*
  - Identifying regionally significant projects
  - Helping applicants apply through 3rd round (6/17 on…)
- Outreach and Education
  - Presentations, marketing, tabling, events

NYSERDA EDGE Update

Examples of on-going projects:

- **Company is renovating an existing facility & upgrading equipment** *(Existing Facilities program)*
- **New building construction/Substantial Renovation** *(New Construction program)*
- **Company is wondering HOW to save $ and energy in their facility** *(FlexTech program)*
- **Manufacturer/Data Center interested in improving process efficiency** *(Industrial & Process Efficiency)*

EDGE and Agriculture

PON 2644: **Agriculture Energy Efficiency Program**:

Identify and implement energy efficient measures (electric/natural gas)

- *Available to farms and on-farm producers (orchards, greenhouses, vegetables, vineyards, grain dryers, poultry/egg/dairy farms)*
- ***Free Energy Audits** at <u>NO COST</u> ($2,500 value)*
- *Project implementation: Incentives for up to 75% of eligible project costs (capped at $250,000)*

NYSERDA R&D

<u>Current</u>:
PON 2112: Solar PV

PON 2149: Solar Thermal

PON 2439: On-Site Wind

<u>Past</u>:
PON 2684: Anaerobic Digester

<u>Future</u>: …..T.B.D?

Thank you!

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Greater Rochester Enterprise
Haley@RochesterBiz.com
585-530-6205

Questions?

Finger Lakes Food Processing Cluster Initiative

Advancing the competitiveness of the food processing cluster in the Finger Lakes region

Sustainability in Food Processing

Workshop presentation will be available at:
www.nysp2i.rit.edu and
http://www.rit.edu/gis/flfpci/

For additional information, contact:
Kathy Kosciolek, Business Manager, NYSP2I
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kxkasp@rit.edu

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