New York State Pollution Prevention Institute

P2 Efforts in the NYS Food & Beverage Sector

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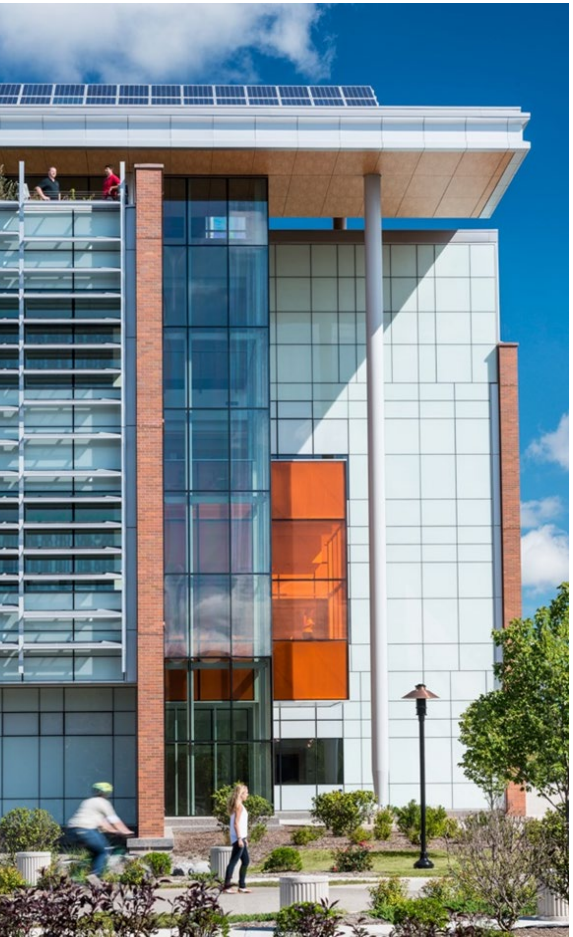
Agenda

- Overview of NYSP2I
- Our Work - Case Studies of F&B Assistance
- P2 Tools - Tech Transfer for F&B
- Future Efforts



NYS Pollution Prevention Institute

- Established in 2008
- Headquartered at Rochester Institute of Technology (RIT) in Rochester, NY
- $3.9M in annual NYS funding administered through the NYS Department of Environmental Conservation
- Focus on reduction of resource consumption (water, raw materials, energy) and elimination of waste and toxics
  - Sustainable Manufacturing Assessments
  - Supply Chain Sustainability
  - Technology Commercialization
  - Food Waste Diversion
  - Emerging Contaminants
  - Outreach & Education
  - Research & Development

Rochester Institute of Technology

- Founded in 1829
- Privately endowed, co-ed university
- 9 colleges emphasizing career education and experiential learning
- 18,600 undergraduate and graduate students
- International locations in Eastern Europe, Dubai, and China

Golisano Institute for Sustainability

- Academic Programs
  - Master's of Sustainable Systems
  - Ph.D. in Sustainability
  - Master's of Architecture
- Technical problem-solving & applied research & development for manufacturers
- Professional staff that work exclusively on industrial engagements

Golisano Institute for Sustainability

Advanced Manufacturing Technology

Built Environments

Eco-Friendly Electronics & E-Waste

Energy Generation, Storage, and Systems

Internet of Things & Analytics

Material Use, Substitution, Risk Mitigation, and Reduction

Food Systems

Pollution Prevention

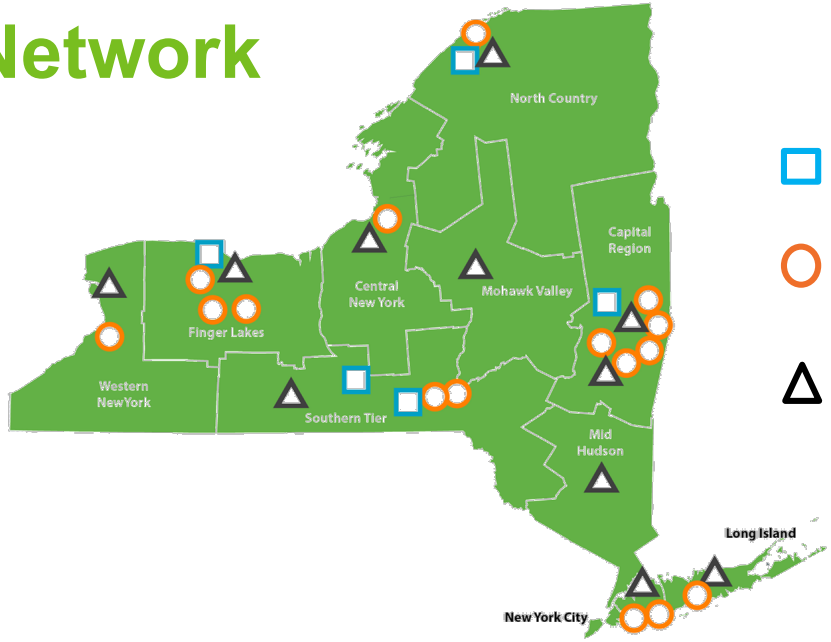
Product Design & Process Efficiency

Remanufacturing

Sustainable Business Practices & Purchasing

Transportation & Interconnected Smart City Systems

Resource Network



- University Partners
- Incubators
- Manufacturing Extension Partnership Centers

Binghamton University, State University of New York
Clarkson University
RIT
Cornell CALS, College of Agriculture and Life Sciences
Rensselaer
New York State of Opportunity, Department of Environmental Conservation
New York Manufacturing Extension Partnership
New York State of Opportunity, Division of Science, Technology & Innovation

Assistance for NYS Companies, Municipalities & Non-Profits

- Must be NYS-based entity
- Typical project cost range is $15-$50k
- NYSP2I funding offsets (off-set 50 – 90%) most of the project cost to the organization
  - Expenses are non-capital expenses
  - RIT's engineering, technical and project management services
- Typical project takes about 2-6 months
- Post-project metrics reporting

NYSP2I Beverage Clients

CHANNING DAUGHTERS

THREE BROTHERS WINERIES & ESTATES

KING FERRY WINERY
Make of Heleaven Wines

FOX RUN VINEYARDS

BROOKLYN BREWERY

NorthAmerican Breweries

ROHRBACH BREWING COMPANY
ROCHESTER 1991 N.Y.

BLACK BUTTON DISTILLING

ABANDON BREWING CO

JAMESPORT VINEYARDS

FAMILY OWNED · SINCE 1980 · BEDELL CELLARS · SUSTAINABLY FARMED · FAMILY OWNED
B
BEDELL

SHINN ESTATE VINEYARDS

NYSP2I Food Clients

Case Study: Finding Reduction Opportunities for Water & Energy

Criteria: Company wants to identify opportunities that can lead to productivity and efficiency gains along with technical and economic feasibility analyses of improvement / environmental options.

Typical projects involve one or more of the following:

- Waste reduction and recycling
- Water conservation and reuse
- Energy conservation and reduction
- Alternative chemical and material use
- Deployment and tech transfer of P2 technology

Background

Identify cost-effective water management and energy savings opportunities in the production process to more closely align with leaders in the industry

Work Performed

- Quantified water use in the different production areas
- Researched potential water and wastewater reduction methods and technologies
- Performed process assessment to identify potential energy savings opportunities
- Performed economic analyses for the potential P2 strategies

Results

- Savings of >$56k/yr and >30% reduction water/product ratio
- Low-flow spray nozzles reduce water use by 36-45%
- Lower flow CIP spray balls reduce water by up to 96%
- Switch manual wash to automatic clean-out-of-place machine
- Routine cleaning of the RO unit membranes for higher efficiency over longer period of time
- Request interval data from their electric utility provider to make informed improvement decisions

Case Study – Identifying Gaps in Sustainable Practices

Criteria: Company wants to identify opportunities to be more competitively positioned as an environmentally-conscious business and supplier.

Typical projects involve one or more of the following:

- Supply chain assessments and plans
- Customer scorecard/questionnaire response guidance and assistance
- Readiness preparation for Ecolabels
- Sustainable sourcing & procurement
- Zero waste assessments and solutions for source reduction

Background

Businesses that strategize, set targets, measure and report their sustainability efforts will likely generate more revenue, retain and create jobs, and reduce the risk of jeopardizing potential business.

Work Performed

NYSP2I created an assessment tool to inquire about various common components of internationally accepted sustainability guidelines, standards, and protocols.

Results

- Anticipate ~10% increase in sales and ~10% increase in job growth
- Measure impacts to set objectives & targets and track performance
- Add policy and action plans to marketing and communications material
- Inform on sustainable purchasing alternatives

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Case Study – Comparing GHG Impact of Whey Bioprocess Tech. vs Palm Oil Production

Criteria: Company has developed working prototype for new product or process that offers an advantage of terms of its impacts to the environment.

Typical projects involve one or more of the following:

- Independent, third-party product testing & evaluation
- Life Cycle Assessment (LCA)
- Competitive product benchmarking
- Environment/energy impact evaluation
- Market viability assessment

Background

Capro-X requested on energy and GHG impact comparison for their fermentation bioprocess technology which processes acid whey into a bio-oil to potentially be used as a palm-oil substitute.

Work Performed

Defined baseline for comparison, conducted literature review, and collected data. Compared calculated energy use and GHG impacts for off-site anaerobic digestion of whey, palm oil production, and Capro-X bioprocess to quantify reductions.

Results

The analysis showed the Capro-X bioprocess has the potential to provide a 93% decrease in energy use and a 92% decrease in GHG impact per gallon of whey as compared to the baseline process.

Case Study – Upcycling Wasted Food

Criteria: Business/organization is food-related and is seeking to improve food waste management practices

Typical projects involve one or more of the following:

- Quantify food waste
- Identify opportunities for waste prevention and diversion
- Assist in overcoming challenges associated with food waste management
- Training & education

Background

A retailer and a food and drink manufacturer wanted to evaluate the viability of collecting excess products and co-streams and turning them into new end-products

Work Performed

Collaborated with a sustainable agribusiness consultant to quantify the available product, evaluate procedures for handling and storage, and analyze shipping logistics, as well as assess various drying technologies and market opportunity

Results

It is logistically feasible for both companies to create new end products via dehydration. The market assessment helped both companies understand the end-product potential.

Case Study – Alternative Uses for Spent Grain Flour

Criteria: Business/organization is food-related and is seeking to improve food waste management practices

Typical projects involve one or more of the following:

- Quantify food waste
- Identify opportunities for waste prevention and diversion
- Assist in overcoming challenges associated with food waste management
- Training & education

Background

RISE wanted to understand the alternative use opportunities for their flour products as they expand their business

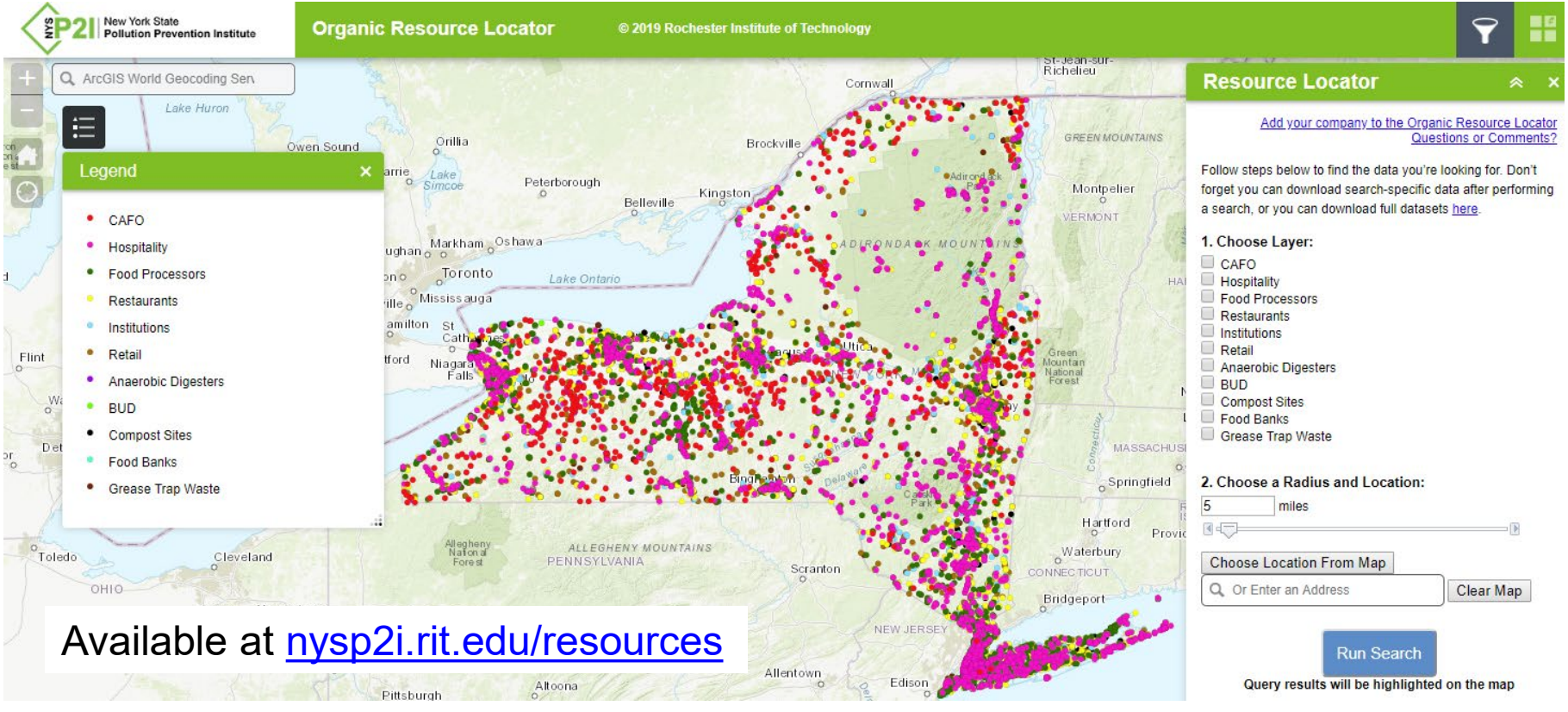
Work Performed

Analyzed RISE flours for 40 different parameters at third party labs. Researched current uses of spent grain and trends in consumer demands

Results

The functional flour, pet food, and plant-based protein markets are the most prominent opportunities identified for RISE flours. The flours are also well suited for partial wheat flour replacement in the functional flour market

P2 Tools/Resources – Organic Resource Locator

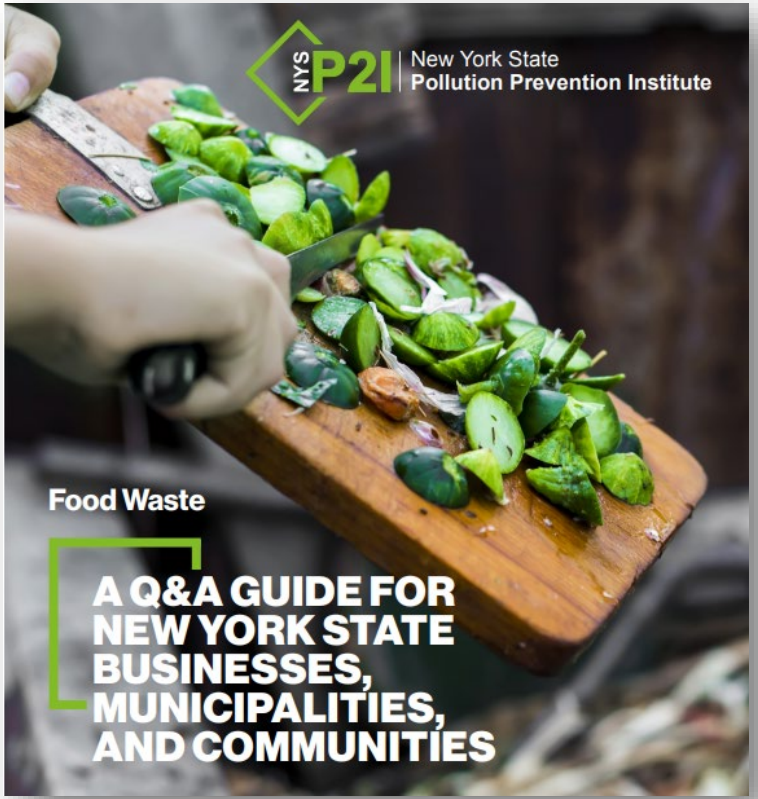


Available at nysp2i.rit.edu/resources

P2 Tools/Resources – Food Waste e-book

- Understanding Sources
- Managing the System
- Prevention Opportunities
- Donation Best Practices
- Recycling Basics

Available at nysp2i.rit.edu/resources



P2 Tools/Resources

Sustainable Winery Practices Guidebook

Collaboration between RIT/NYSP2I & Cornell/CALS

New York State Pollution Prevention Institute

Cornell CALS

Winery Self-Assessment

Five (5) areas are identified for self-assessment in winery operations:

A. Sustainability Planning
B. Water Use and Wastewater Generation
C. Energy Use
D. Material Use
E. Waste Management

These areas are analyzed using a four-part framework:

1. **Scorecard Questions** to evaluate current winery sustainability practices
2. **Explanation** of the subject matter
3. **Improvement Opportunities**, if applicable
4. **Case Study**, when available

Call to Action

- Looking for wineries willing to test drive the workbook and provide feedback
- Please Call Chris Gerling from Cornell if interested in participation

  Phone: (315) 787-2277

  Email: cjg9@cornell.edu

Future Efforts – NYSP2I Sustainable Brewery Initiative

EPA SRA Grant 2019 - 2021

- Offer practical P2 tools to craft breweries
- Measure to reduce water, chemical use, and energy use
- Conduct 10 on-site assessments and assist with one implementation of a P2 solution
- Create a guidance document as a tool for other breweries to “self-implement” P2 strategies
- Host a summit to disseminate best practices and provide a forum to exchange ideas and network with environmental experts.
- Collaboration with:

Cornell CALS · New York State Brewers Association · BA Brewers Association · FUZEHUB

Project Kick-off and Promotion — Year 1
- **Kick-off webinar** with key brewery stakeholders
- Work with the project partners to leverage their networks and communication platforms to **promote the initiative**

Brewery Screening and Selection — Year 1
- Develop **screening survey**
- Contact breweries to collect baseline metrics
- **Select** a min. of 10 breweries

P2 Opportunity Assessments — Year 2
- Develop the **assessment tool / checklist.**
- Conduct on-site assessments for the **10 breweries**
- Prepare assessment summary report

Tech Assistance for Implementation — Year 3
- Complete **implementation technical assistance project**
- Final written summary report for brewery

Technology Transfer — Year 3
- **Sustainable Brewery Summit**
- Summary of 10 opportunity assessments
- Implementation case study and guidance document

Future Efforts - New York State Brewery Supply Chain

Identify sustainable practices in an upstream supply chain for brewers → Influence change and implement best practices through a Supply Chain Code of Conduct

1. Conduct research to identify sustainable and unsustainable supplier practices
    - Focus on raw materials (harvesting, processing practices)
    - Packaging (raw materials and products, packaging materials)
    - Purchasing practices (Supplier Code of Conduct, local suppliers, ecologo certified suppliers)
2. Develop and deliver outreach & education content for brewers
3. Develop a Code of Conduct (COC) and Supplier questionnaire to help brewers implement upstream supply chain transparency / traceability
    - Pilot the COC with two brewers with at least one supplier each
    - Share COC with NYS brewers

Future Efforts - Food Waste Working Group

Additional Funding Sources - Food Waste Reduction & Diversion Reimbursement Program

- Empire State Development selected RIT in 2018 to administer a grant program aimed at reducing food waste in landfills
- $4M available over a 2-year period or until funding runs out
- Reimbursement up to 44% of eligible equipment expenses
- Eligible projects must divert food waste from landfills or incinerators

Thank You

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