



@SJ_Program
#SustainableStateNJ

Moving as a Society Toward Zero Waste



2016 NEW JERSEY SUSTAINABLE SUMMIT



PRESENTERS

- Gary Sondermeyer
- Cynthia Andela
- Ray Crabbs
- Rocco D'Antonio





SiQ₂Neer™

A technological paradigm shift in glass recycling processing



In the US, 75% of all glass that enters the waste stream ends up in the landfill

Recycling programs in the country

- Based on the assumption that the only market for glass is the container & fiberglass industries
- United States generates approximately 11 Million tons of waste glass
- About 20% of that glass is collected through recycling programs
- Only 45% - 50% of that glass is recycled back into bottles or fiberglass
- The rest goes into the landfill

Traditional Glass Recycling

Current recyclers
rely on optical sorting
to separate color



Which is then
sent to a furnace
to be melted



Solution

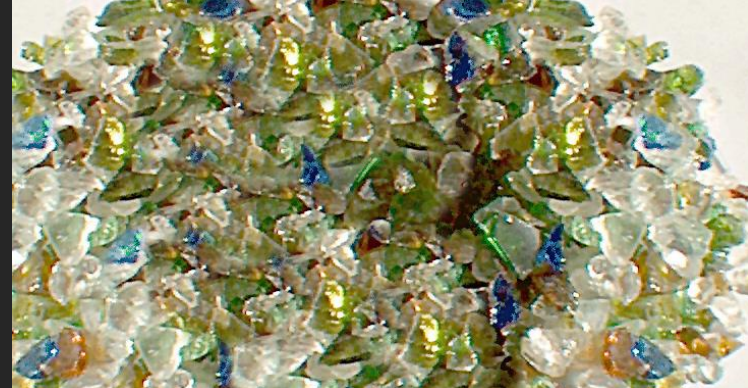
Sioneer's process
is able to pulverize and sanitize



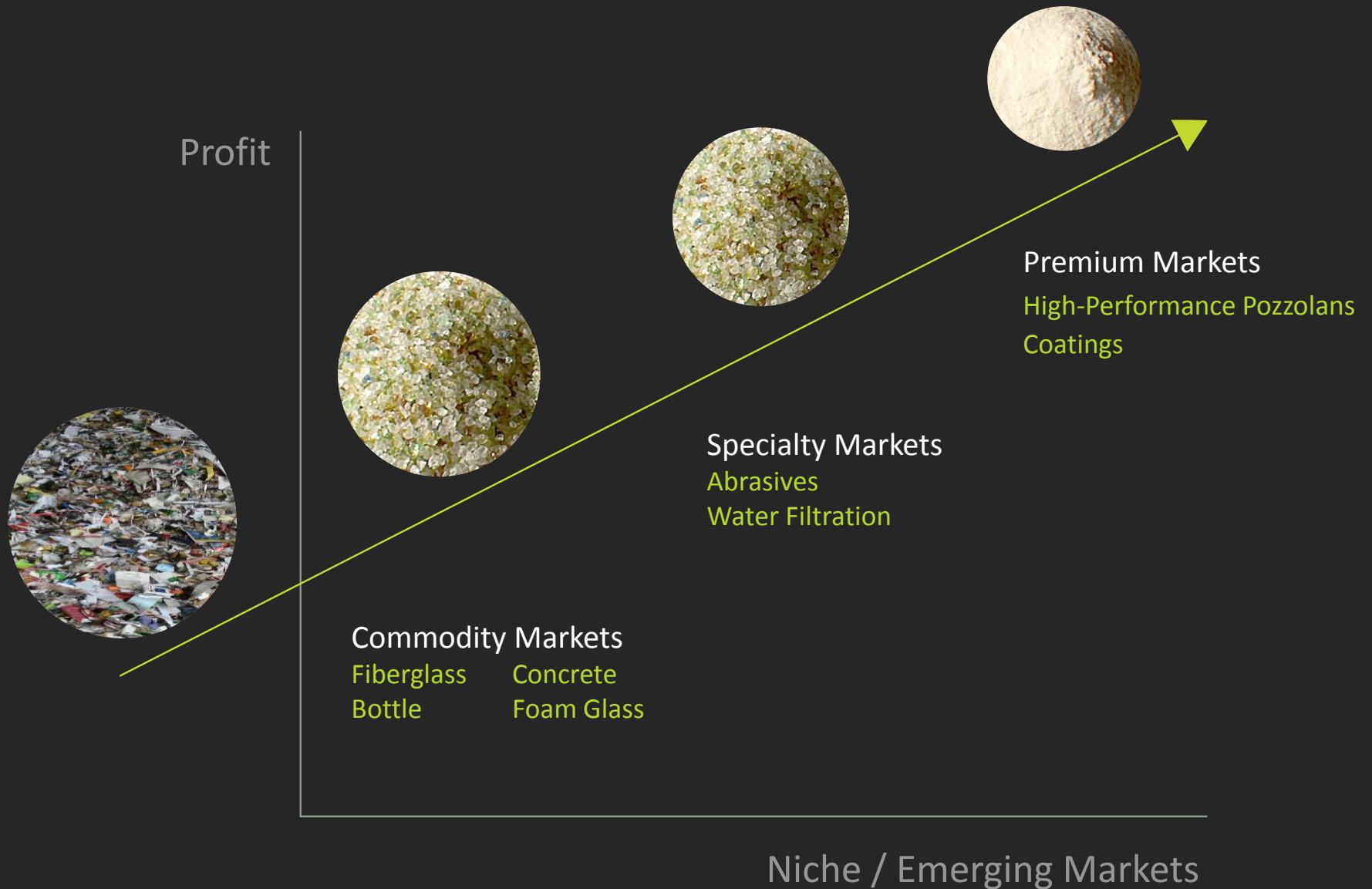
100%

of glass
in the recycling stream

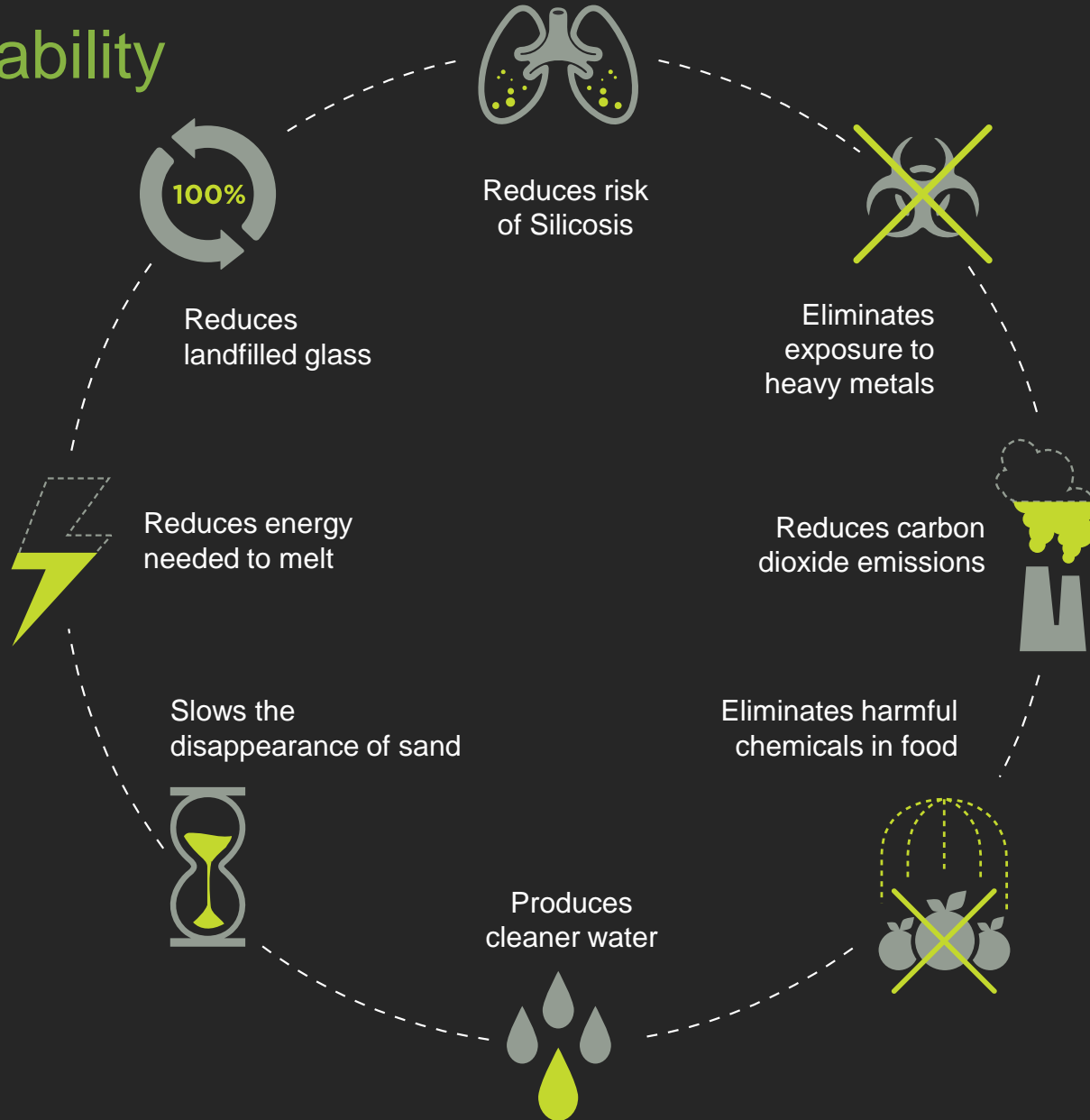
Sioneer Technology processing the glass into Amorphous Silica



Industrial Minerals



Product Sustainability



Pozzolan in concrete



Reduces risk of Silicosis



Eliminates exposure to heavy metals



Reduces carbon dioxide emissions



Pr
clea



Greenhouse Gas Reduction

GHG Reduction from Beverage Industry

Potential GHG reduction from glass in Concrete

Ratio of cullet used to GHG - 6 to 1

Ratio of cullet used to GHG - 1 to 1

Glass cullet requires less energy to re-melt and increases new bottle production rates.

One ton of CO₂ required to make one ton of cement
Glass Pozzolan replaces 20% of the cement in concrete

Other Commodity Markets

Market	Impact
Beach Sand Restoration	Slows the disappearance of the world's 2 nd largest commodity—sand. (sand-wars.com)
Blasting Abrasives	Replace carcinogenic coal slag with glass abrasives in sand blasting applications
Use Amorphous Silica as a replacement for Crystalline Silica (ordinary sand)	Minimize risk of Silicosis—a respiratory disease caused by inhaling Crystalline Silica dust
Feedstock for Foam Glass	Lightweight aggregate for construction
Use glass in water filtration markets	Cleaner water due to the natural negative charge of the glass
Replacement for Diatomaceous Earth	Use as a natural pesticide in agriculture

Evolution of the Clean Glass Process



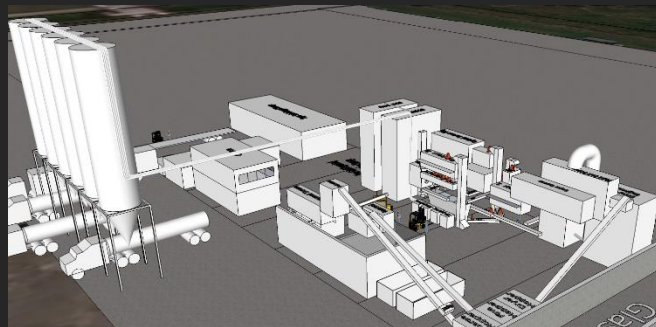
Pilot Plant
Richfield Springs NY



Source Separated
Momentum Recycling, Salt Lake City, Utah



Single Stream
Tricentris, Quebec



Single Stream
Next Generation 20 TPH Facility

Public Private Partnership



Local Government is ultimately responsible for recycling and disposal of the glass.

Local Government is responsible for the environment and sustainability.

Local Government is responsible for public infrastructure, cleaner safer products and to stimulate local economic development

Public – Private Partnership Opportunity - Example

- New Jersey City
 - Support from local political leaders
 - Local support in the form of low cost loans
 - Local support for the request of State loan programs
 - Local Support for location of facility
 - Local support for use of products

- Benefits to City
 - Perpetual Revenue stream based on market development
 - Reduction of landfill costs
 - Long term infrastructure savings due to 100 year concrete
 - Additional jobs and stimulation to the local economy
 - Dramatic reduction the GHG

SiONEER™

Contact: Cynthia Andela
Candela @ Sioneer.com
607-435-0276



2016 NEW JERSEY
SUSTAIN ABILITY
SUMMIT

Moving as a Society toward Zero Waste

Organic waste recycling is all we do

- Vertically integrated
 - From collection to end products sales
- Multi-feedstock processors
- Dual Technology
 - High-solids digestion
 - In vessel composting
- Completely indoor facility
- Production model vs waste model
- ***End product focused***



Management Team

Experienced management team

- 25 years food service experience
- 25 years transportation experience
- 15 years renewable energy experience
- 25 years indoor composting experience
- 25 years composting sales experience
- 7 years food waste collection experience



Business Philosophy

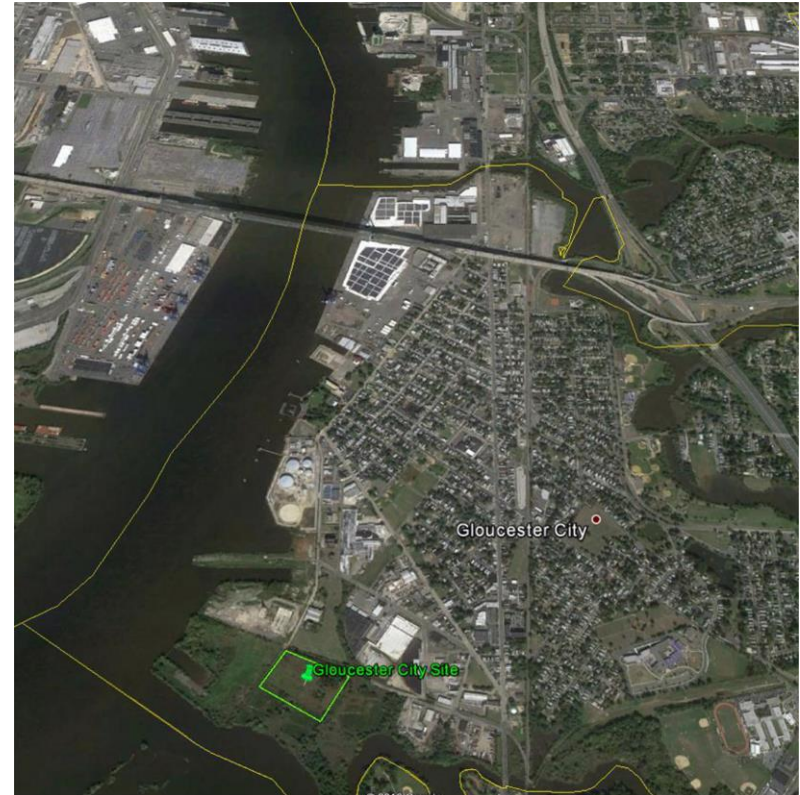
- To build and operate medium-scale organics recycling facilities in the Northeast.
- To extract the highest environmental and economic value from the organic waste stream in the form of renewable energy and high-quality compost.
- Operate world class facilities using the best available control technologies, while encompassing fully enclosed, odor-free organics receiving and processing facilities.
- ***Serve the communities by offering organics recycling and renewable energy to the community and businesses within 25 miles of each plant.***



Gloucester City Organic Recycling, LLC

850 Water Street
Gloucester City, NJ 08030

- Former BP / Arco Terminal Site
- Brownfield Site vacant for 30 years
- Three party settlement agreement with City, BP / Arco and NJDEP
- Remediation at no cost to the City



Moving toward Zero Waste

There is no “Zero waste” without dealing with food waste

Biomass Waste in MSW (2010) (Tons)				
	% MSW	Disposed ⁴	Incinerated ⁵	Landfilled
Total MSW	100.00	5,917,468	1,463,537	4,453,931
Food waste ¹	15.82	936,143	231,532	704,612
Paper Waste ²	19.45	1,150,947	284,658	866,289
Other Biomass ³	26.93	1,593,574	394,131	1,199,443
Total Biomass	62.20	3,680,665	910,320	2,770,345

Sources

1 USEPA

2 Percentage given by Ray Worob of NJDEP

3 Municipal Solid Waste. EPA. Accessed 1 Feb 2013. <http://www.epa.gov/epawaste/nonhaz/municipal/index.htm>

4 2010 New Jersey Generation, Disposal and Recycling Statistics: By County. Solid and Hazardous Waste Management Program. NJDEP. Accessed 6 Nov 2012. http://www.state.nj.us/dep/dshw/recycling/stat_links/10disposalrates.pdf

5 Data given by Joseph Davis MPA, Data base Analyst 1 of NJDEP that was received 11/9/12

The Food Waste Issues

- Lack of receiving infrastructure
- Multiple closed facilities in NJ and the US
- Waste model vs manufacturing model
- Development / Investment risk factors
- Stakeholder issues



The Food Waste Solutions

Government Regulation

- REC's / Feed-in Tariffs
- Compost Market Development
- Food Waste Disposal Ban

Investments are being made and jobs are being created in States that have at least two of the above

Appropriate Technology Deployment for the Market

SENATE, No. 771

STATE OF NEW JERSEY


217th LEGISLATURE

PRE-FILED FOR INTRODUCTION IN THE 2016 SESSION

Sponsored by:
Senator BOB SMITH
District 17 (Middlesex and Somerset)
Senator CHRISTOPHER "KIP" BATEMAN
District 16 (Hunterdon, Mercer, Middlesex and Somerset)

SYNOPSIS
Requires large food waste generators to separate and recycle food waste and amends definition of "Class 1 renewable energy."

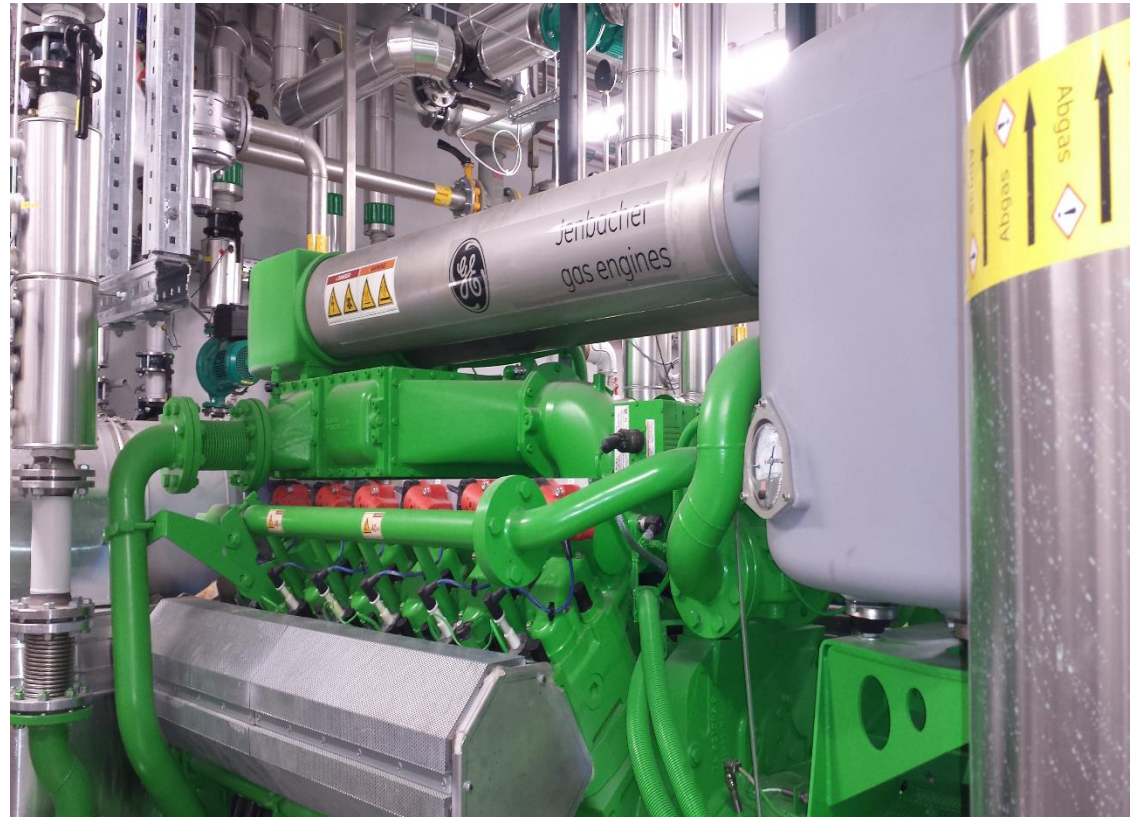
CURRENT VERSION OF TEXT
Introduced Pending Technical Review by Legislative Counsel.



The Great Seal of the State of New Jersey, featuring a shield with a plow and a sheaf of wheat, flanked by two female figures representing Liberty and Justice, with the motto 'LIBERTY AND JUSTICE' and the date '1776'.

Technology Platform

- Multi-feedstock
 - Wide Variety of Organic Waste
- Dual Technology
 - High-Solids Anaerobic Digestion
 - In Vessel Composting
- Odor Management
 - Completely Indoors
 - O&M
 - Housekeeping
 - Negative Pressure
 - Biofilters & Scrubbers

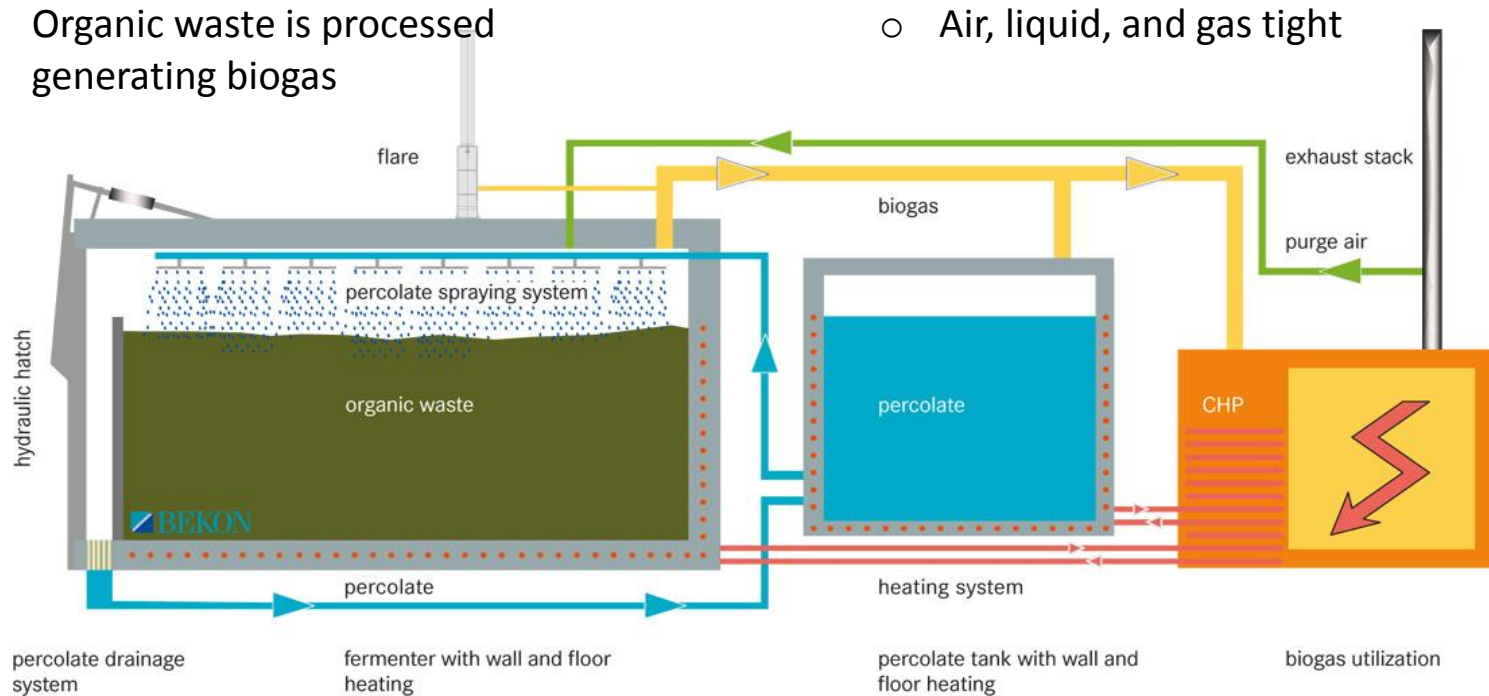


High-Solids Digestion



High-Solids Digestion

- Materials are mixed and filled with a wheel loader into concrete digesters
- Organic waste is processed generating biogas
- Biogas sent to a combined heat and power unit
- Air, liquid, and gas tight



In Vessel Composting

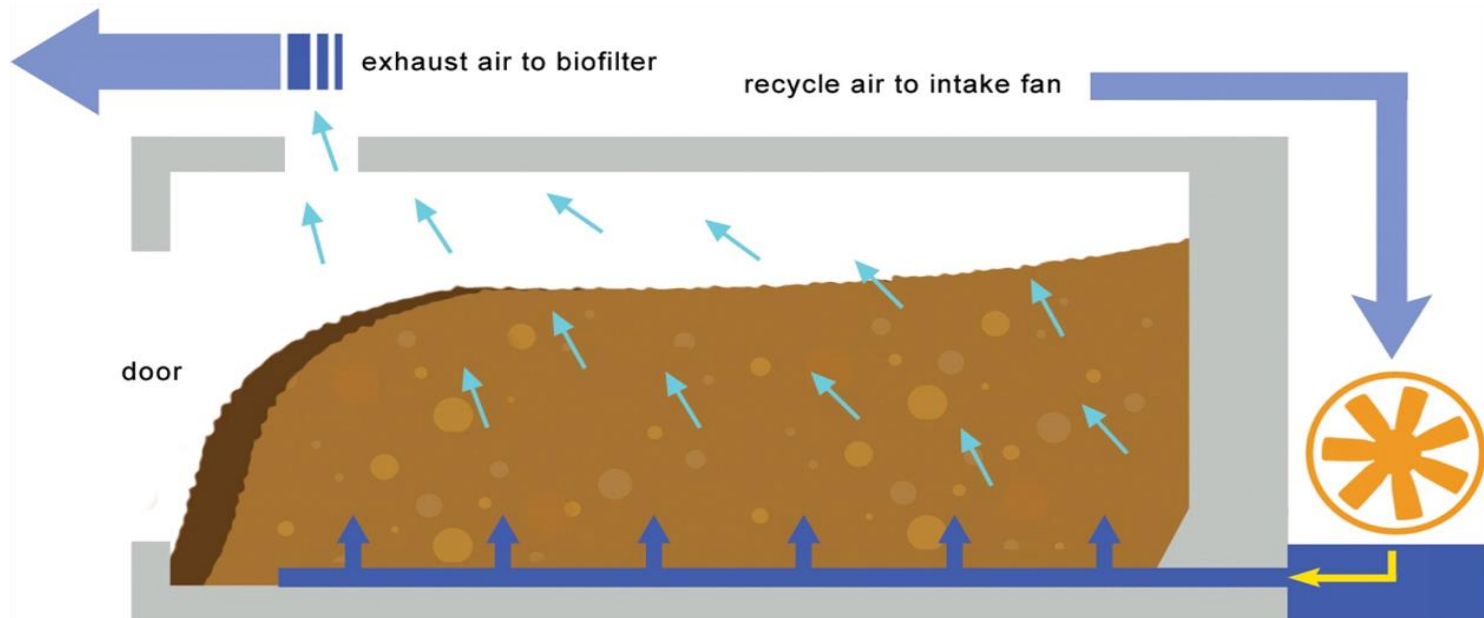
Indoor composting operations utilizes Aerated Static Pile (ASP) technology

- Industrial-scale composting facilities
- Modified Aerated Static Pile (ASP) processes and stabilizes organic materials into high-quality compost
- Refined over forty years of operations
- All operation are done indoors under controlled conditions



In Vessel Composting

- Materials loaded into aerated composting bays with sliding doors
- No mixing or turning
- Reaches temperatures over 140° F
eliminating odor causing compounds
- *Handles any residual liquids from digestion*



Odor Management & Control

Odor management is a fundamental business practice required for successful organics recycling in New Jersey. ***ALL operations are conducted indoors under negative pressure.***

Integrated odor management into every aspect of business planning and the business model including:

- Business Philosophy
- Generator Training Programs
- Equipment & Supplies Selection
- Collection Methodology
- Collection Equipment
- Truck Routing
- Technology Selection
- Facility Design
- Operations Plan
- Housekeeping Procedures
- End Product Marketing & Sales



Compost Production

The Organic Diversion team formulates and markets compost-based products

- In-house designed process produces consistent, high-quality compost
- 400,000 cubic yards of compost sold annually
- Customers include base in bagged, bulk, wholesale, landscaping, construction, nurseries, erosion-control industries and the agricultural market

Compost

- Saves Water
- Reduces chemical fertilizer use
- Reduces topsoil loss, curbs erosion
- Restores and replenishes depleted soil
- Improves resistance to pests and diseases





Conservation

Use Only What You Need

Tips & Tools

Your Water Consumption History

Water Use Rules & Regulations

Rebates

Single-Family Residential Audits

Commercial and Multifamily Services

Conservation Plan

WaterSense

Soil Amendment Program

Compost Classifications

Local Class I and II Compost Suppliers

Remodel Your Yard

Weather Reporting

Resource Links

Home > Conservation > Soil Amendment Program

Soil Amendment Program

Before a newly constructed premise may be landscaped, property owners must amend their soil with [compost](#) so the soil more efficiently retains water. This rule applies to all new residential, commercial, government and industrial properties within Denver Water's service area.

- > Importance of Soil Amendment
- > To Pass a Soil Amendment Inspection
- > Schedule a Soil Amendment Inspection
- > Winter Extension
- > Phased Projects

For more information:

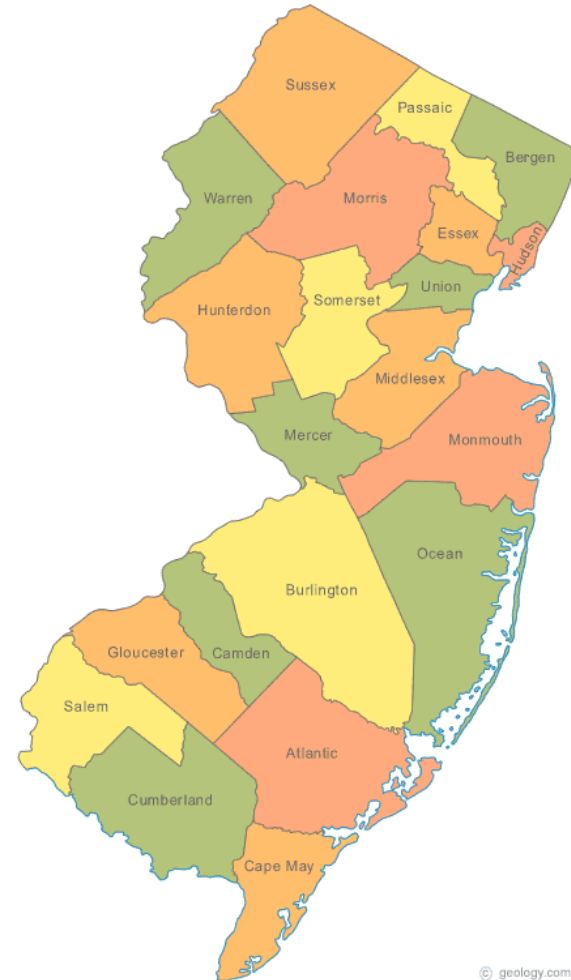
Soil amendment: 303-693-2444 or customercore@denverwater.org

Tap issues: 303-628-6100

Meter set/inspection: 303-628-6165

Food Waste Recycling in NJ

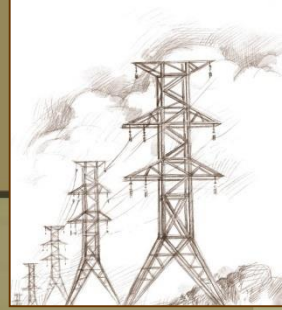
New Jersey can easily lead the nation in food waste recycling if we take the time to build the necessary foundation to attract investment and create jobs to deploy the proper technology platforms throughout the State.





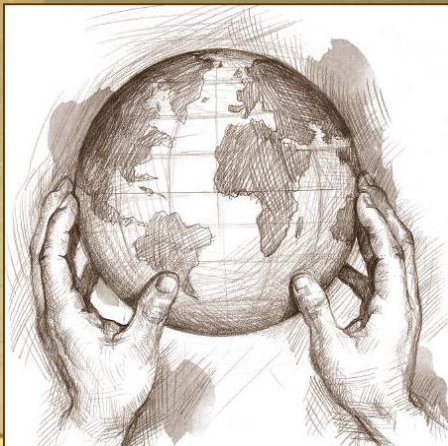
Organic
Diversion
food and organics recycling

RE-VISIONING THE U. S. ENERGY INDUSTRY – SUSTAINABLE ENERGY NOW



IS ZERO WASTE A PRACTICAL REALITY?

*IF SO, WHAT IS THE POTENTIAL ROLE FOR:
THE COMMUNITIES OF NEW JERSEY?*



2016 SUSTAINABILITY SUMMIT
The College of New Jersey – June 15, 2016

INEOS New Planet BioEnergy – Waste to Energy

Organic Waste to Ethanol & Power:



COMMISSIONED – JULY, 2013.

Integrated BioEnergy Complex

Operational Design:



IBC
Landlord & Infrastructure

INTEGRATED BIOENERGY COMPLEX

PHASE 1 TECHNOLOGIES
(Waste Stream Processing Center)

PHASE 2 TECHNOLOGIES
(Thermal Conversion Processing Center)

**Waterway
Recycling**
120,000
T/Y
C&D

**Creating
RDF**
**(Adv
BioFuels, GTL
& Plasma)**
-
100,000 T/Y

Red Text = Waste Streams from a 'sister' technology(ies) as a feedstock.

WATERWAY

CONSTRUCTION
WASTE RECYCLING



© 2016 Google

Google earth

1990

36°45'38.99" N 76°17'47.66" W elev 51 ft eye alt 432 ft

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Waterway
Recycling
120,000
T/Y
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Creating
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(Adv
BioFuels, GTL
& Plasma)
-
100,000 T/Y

PHASE 2 TECHNOLOGIES (Thermal Conversion Processing Center)

Waterway
Materials
120,000
T/Y
Aggregate

Concrete,
Brick/Block &
Asphalt
(Plasma)
-
120,000 T/Y

Red Text = Waste Streams from a 'sister' technology(ies) as a feedstock.

Waterway Materials

Brick, Block, Concrete & Asphalt:



Integrated BioEnergy Complex

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INTEGRATED BIOENERGY COMPLEX

PHASE 1 TECHNOLOGIES (Waste Stream Processing Center)

**RePower
South**
350,000
T/Y RDF

MSW,
Scrubbers &
Sorbents
(E-Recycle &
Transfer
Station)

-
200,000 T/Y

**Waterway
Recycling**
120,000
T/Y
C&D

Creating
RDF
(Adv
BioFuels, GTL
& Plasma)

-
100,000 T/Y

**Waterway
Materials**
120,000
T/Y
Aggregate

Concrete,
Brick/Block &
Asphalt
(Plasma)

-
120,000 T/Y

PHASE 2 TECHNOLOGIES (Thermal Conversion Processing Center)

Red Text = Waste Streams from a 'sister' technology(ies) as a feedstock.

RePower South - Chesapeake



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INTEGRATED BIOENERGY COMPLEX

PHASE 1 TECHNOLOGIES (Waste Stream Processing Center)

PHASE 2 TECHNOLOGIES (Thermal Conversion Processing Center)

**RePower
South**
350,000
T/Y RDF

**E-
Recycling**
60,000 T/Y
Metals

**Waterway
Recycling**
120,000
T/Y
C&D

**Waterway
Materials**
120,000
T/Y
Aggregate

MSW,
Scrubbers &
Sorbents
**(E-Recycle &
Transfer
Station)**
-
200,000 T/Y

Electronics,
Washers,
Dryers, TV's
**(Adv BioFuels
& GTL)**
-
100,000 T/Y

Creating
RDF
**(Adv
BioFuels, GTL
& Plasma)**
-
100,000 T/Y

Concrete,
Brick/Block &
Asphalt
(Plasma)
-
120,000 T/Y

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Operational Design:

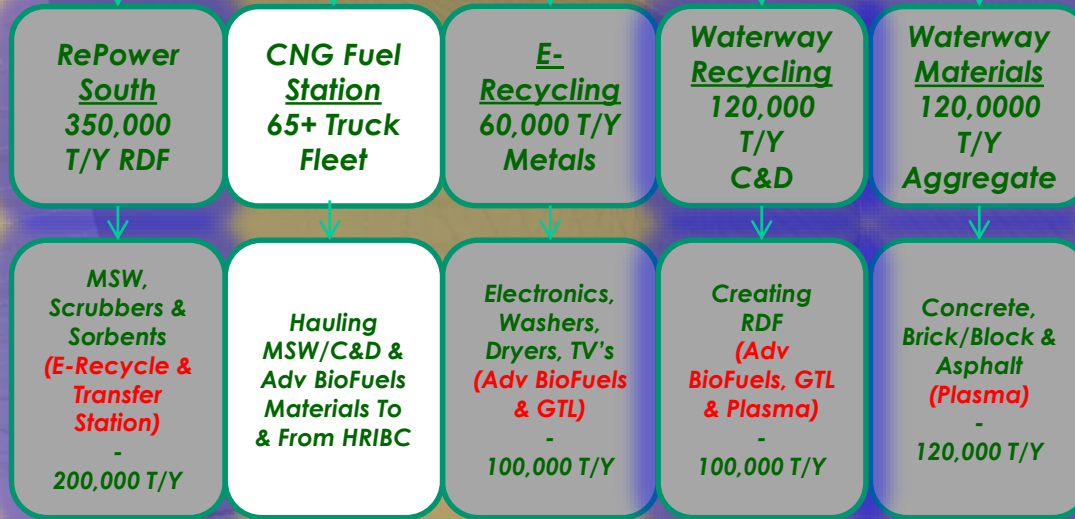


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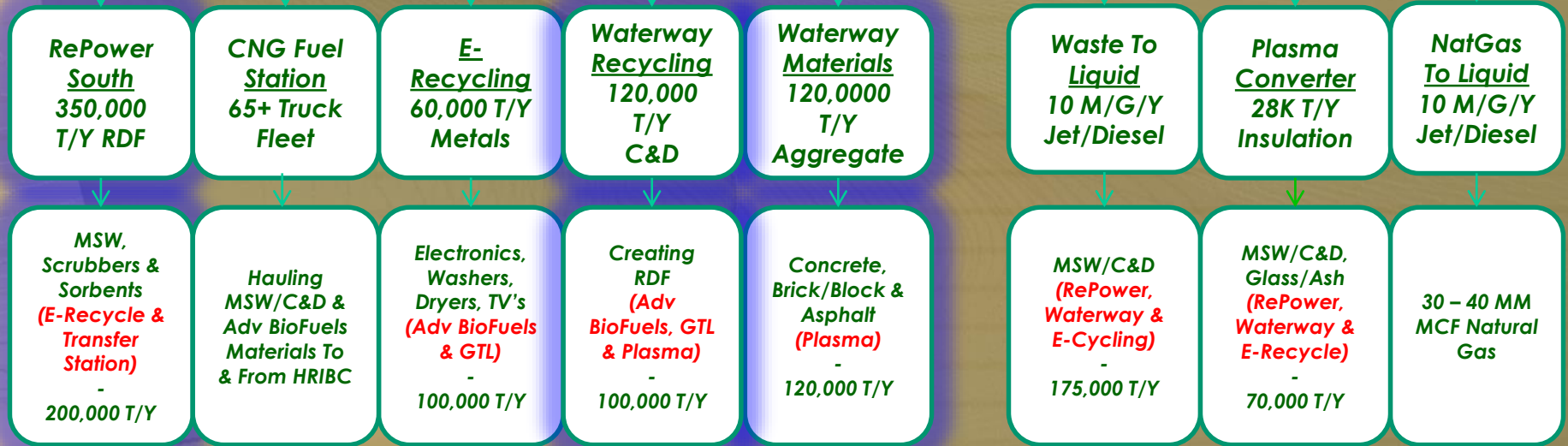


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Regional Impact:



Integrated BioEnergy Complex

Estimated Annual Regional Impact:



- **Waste Materials Processed – ~895,000 tons/year:**
 - ✓ ~120,000 tons/year of C&D waste;
 - ✓ ~120,000 tons/year of aggregate;
 - ✓ ~350,000 tons/year of municipal solid waste;
 - ✓ ~ 60,000 tons/year of electronic waste;
 - ✓ ~175,000 tons/year of IBC organic by-product waste;
 - ✓ ~ 70,000 tons/year of IBC inorganic by-product waste.

- **Environmental Impact – (500,000+) tons/year CO₂ equivalents:**
 - ✓ Each of the technologies have a negative carbon footprint;
 - ✓ RePower South's MSW process = eliminating ~50,000 cars/year;
 - ✓ All systems will use best of class environmental practices.

- **Annual Total Revenue Stream - ~\$85,000,000:**
 - ✓ ~120,000 tons/year of recycled metals, plastics, etc.
 - ✓ ~200,000 tons/year of organic RDF;
 - ✓ ~120,000 tons/year of reclaimed aggregate;
 - ✓ ~175,000 tons/year of BioFuel for coal power plants;
 - ✓ ~20 million gallons of green liquid fuels;
 - ✓ ~ 28,000 tons/year of fire retardant insulation.

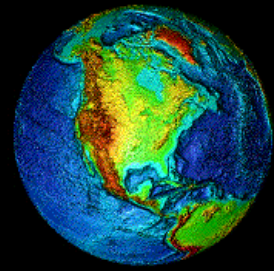
Integrated BioEnergy Complex

Estimated Regional Impact:



ESTIMATED REGIONAL ECONOMIC DEVELOPMENT BENEFITS

	<u>2016 & 17</u>	<u>2020</u>	<u>5 Year Total</u>	<u>10 Year Total</u>
DIRECT				
Payroll (~400 Employees – Total)	\$ 4,000,000	\$ 16,000,000	\$ 55,000,000	\$ 135,000,000
Property Tax (at 1% CapEx)	\$ 100,000	\$ 5,000,000	\$ 11,000,000	\$ 37,000,000
Construction Payroll	\$ 7,500,000	\$ 1,000,000	\$ 27,500,000	\$ 50,000,000
Sub-Total	\$ 11,600,000	\$ 22,000,000	\$ 93,500,000	\$ 222,000,000
INDIRECT				
Potential Peripheral Employment	\$ 2,000,000	\$ 60,000,000	\$ 200,000,000	\$ 540,000,000
Total	\$ 13,600,000	\$ 82,000,000	\$ 293,500,000	\$ 762,000,000

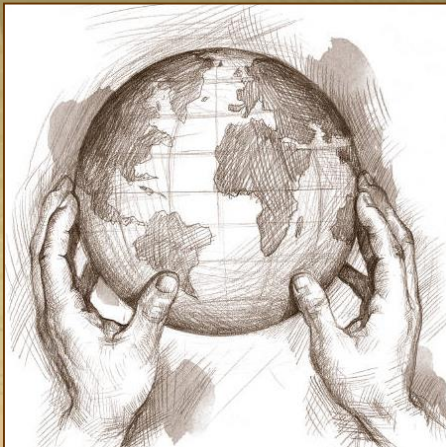


INTEGRATED BIOENERGY COMPLEX

for the

Hampton Roads, Virginia Region

Energy Independence Through World Class Technologies®



Ray Crabbs, President & CEO
VISION Associates

(202) 253-5953 – Cell
vsnasoc@cox.net