

Overview of Value Added Products Advanced Technologies in Manure Management and the Chesapeake Bay

Chesapeake Goal Line 2025:
Opportunities for Enhancing Agricultural Conservation
October 6, 2010



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College of Agricultural Sciences

Charge

- Overview advanced technologies for the dairy, swine, and poultry industry that
 - reduce nutrients and
 - provide a value added product as a result of the conversion process.



Value Added Ag

USDA Rural Business Development defines as:

- A change in the physical state or form of the product (e.g. milling wheat into flour or making strawberries into jam).
- The production of a product in a manner that enhances its value, as demonstrated through a business plan (e.g. organically produced products).
- The physical segregation of an agricultural commodity or product in a manner that results in the enhancement of the value of that commodity or product (such as an identity preserved marketing system).
- **ADDITION:** Generation of farm-based renewable energy



Value-added ag continued...

- As a result of the change in physical state or the manner in which the agricultural commodity or product is produced and segregated
 - the customer base for the commodity or product is expanded and
 - a greater portion of revenue derived from the marketing, processing or physical segregation is made available to the producer of the commodity or product.



Projects that (a) reduce nutrients and (b) result in value added products

Adv Tech	Dairy	Poultry	Swine
Bion	✓	✓	
EnergyWorks	✓	✓	
CARD	✓	☑	
ElectroCell			✓
Cow Power	✓		
FibroWatt		✓	
TX Dairy Composting	✓		
Perdue AgriRecycle		✓	
CBF Composting	✓		



http://bionpa.com/

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Bion's Livestock Manure Waste Treatment Project at K...



Contact: Jeremy Roland, 303-733-4044

Welcome to the website for Bion's Nutrient Management Facility at the Kreider Dairy Farm

This site is designed to provide the stakeholder community of Pennsylvania's Susquehanna River watershed -- residents/taxpayers/ratepayers, government officials, members of environmental and other public interest groups, academics and interested parties-- an opportunity to learn about Bion's demonstrated and 3rd party reviewed livestock manure treatment technology as well as to pose questions and air views on the proposed project for all to see.

This website is managed by [Bion Environmental Technologies, Inc.](#)

The contents of this website includes forward-looking statements based on Bion's best current understanding. In this document, the word 'potential', 'will', 'proposed' and similar expressions identify certain forward-looking statements. These statements are made in reliance on the Private Securities Litigation Reform Act, Section 27A of the Securities act of

“a unique comprehensive treatment of livestock waste that achieves substantial reductions in nitrogen and phosphorus, ammonia, greenhouse and other gases, as well as pathogens, hormones, herbicides and pesticides. Bion's process simultaneously recovers cellulosic biomass from the waste stream to produce renewable energy.”

Bion Environmental Technologies and Bion PA1, LLC:

- Operation
 - Microaerobic biological reactor and combustion of the coarse solids and the export of all or a portion of the coarse solids out of the Chesapeake Bay Watershed.
- Nutrient reduction projected
 - 106,000 lbs N from dairy (certified credits) and 4,000,000 lbs N from four poultry operations (projected)
- Bion to demonstrate that there is a difference (compared to the manure currently used on Kreider Farm) in:
 1. N bioavailability occurring in the field as a result of the use of the effluent (liquid and fine solids) discharged from the reactor; and
 2. The level of denitrification occurring in the field as a result of the use of the effluent (liquid and fine solids) discharged from the reactor.





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For More Information

Contact:

Mike McCaskey

717.606.2794

Premium Attribute Nutrient Credits

Credits are generated by a special purpose Renewable Energy and Nutrient Recovery Facility

- Credits are certified for the Susquehanna River and Potomac River basins within Pennsylvania
- Credits available for the 2011 water year
- Credit generation facility is designed and constructed for a 30 year life
- Quantities sufficient to meet the long-term needs of large buyers
- Nutrient Credit Generation Process certified by the Pennsylvania of Environmental Protection in February 2010
- Real-time measurement and verification of Nitrogen and Phosphorous credits
- Bilateral sale/purchase agreement
- Quarterly delivery and settlement

Long-term credit supply agreements are tailored to enable private or public entities to optimize capital required to achieve and maintain NPDES permit compliance

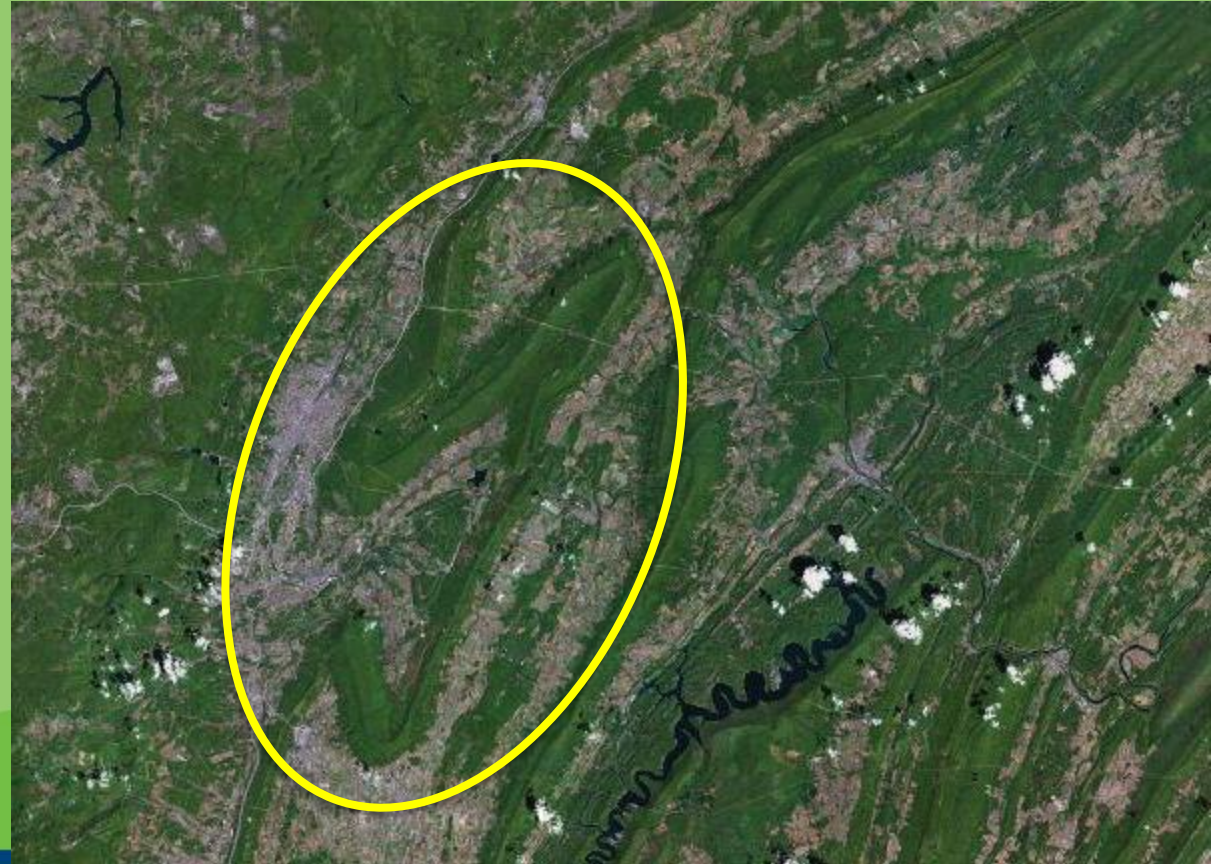
EnergyWorks BioPower, LLC

- Process poultry manure Adams Co farm
- Enclosed facility
 - Renewable energy
 - Nutrient credits
 - 1,051,570 lbs N; 53,853 lbs P
 - Ash by-product – fertilizer or feed supplement



Cove Area Regional Digester (CARD)

- Morrison's Cove
- 25,000 cows –
200
tons/day
0.170
MGD of raw
dairy manure



Cove Area Regional Digester (CARD)



– Process

- Egg-shaped digester (ESD) – anaerobic, 1.2 Mgal, residence time – 9 days
 - 1 mill cubic feet biogas produced per day, 2.2 Megawatts electricity
- Proprietary wastewater treatment with nutrient credit sales for N and P.
 - 628,000 lbs N and 36,000 lbs P
- By-product as fuel source for co-generation
 - Contact HRG Engineers: Chuck Wunz, 814-238-7117



ElectroCell - Swine

- “Green Cycle Ag Nutrient Credits™”
 - “Using the Patz OZY technology to provide treatments for manure storage tanks that has **resulted in significant reductions in nutrients such as P205 and Nitrogen.**”
 - System “...proprietary process using electroporation, killing pathogens, binding phosphorus, reducing volume.”
 - Snavelly Hog Farm, Elizabethtown, PA
 - Nutrient Credits - 3,318 lbs N, 462 lbs P

ECT PA Contact: Jake Strawb
215 651 9870
ECT US Contact: Buzz Hoerr
802 734 1621

Patz Oxy on Snavelly Farm pictured.





Central Vermont Public Service

ENERGIZING VERMONT FOR 75 YEARS



AEG

Agriculture & Environment Center

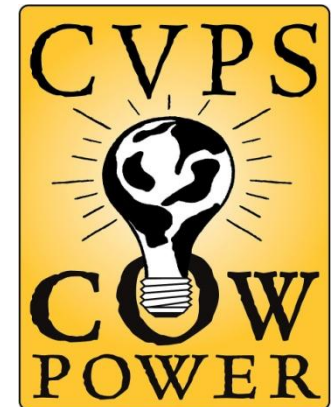
...connecting science with policy

Manure Du Jour

Linking Livestock and Renewable Energy

April 22, 2010

David J. Dunn
ddunn@cvps.com

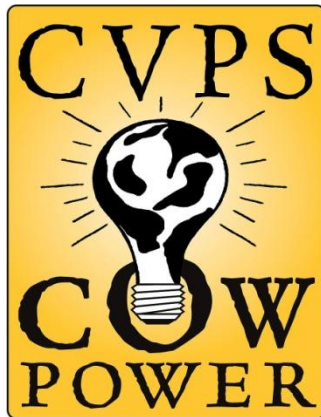


http://www.cvps.com/cowpower/cow_power_recut2009.wmv





CVPS Cow Power™



A renewable energy program directly linking electric customers with farms.

- Provides customers an energy **choice**.
- Provides farms with new **revenue**.
- Provides tools to **protect** environment.





Benefits to a 1,000 Cow Farm

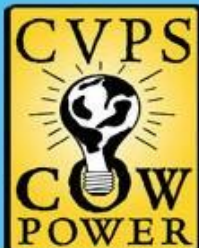
- Wholesale Power Purchase average **\$0.07/kWh** through December 2009. (**\$98,000 annual income**)
- 2010 Vermont Feed-In-Tariff, will provide new projects with **\$0.16/kWh**. (**\$224,000 annual income**)
- Cow Power premium provides additional **\$0.04/kWh** (**\$56,000 annual income**)
- Use of digested solids as a replacement for purchased bedding (**\$120,000 annual savings**)
- Waste Heat offsets fuel costs for hot water in dairy. (**\$15,000 annual savings**)
- Reduced Odor, pathogens and weed seeds





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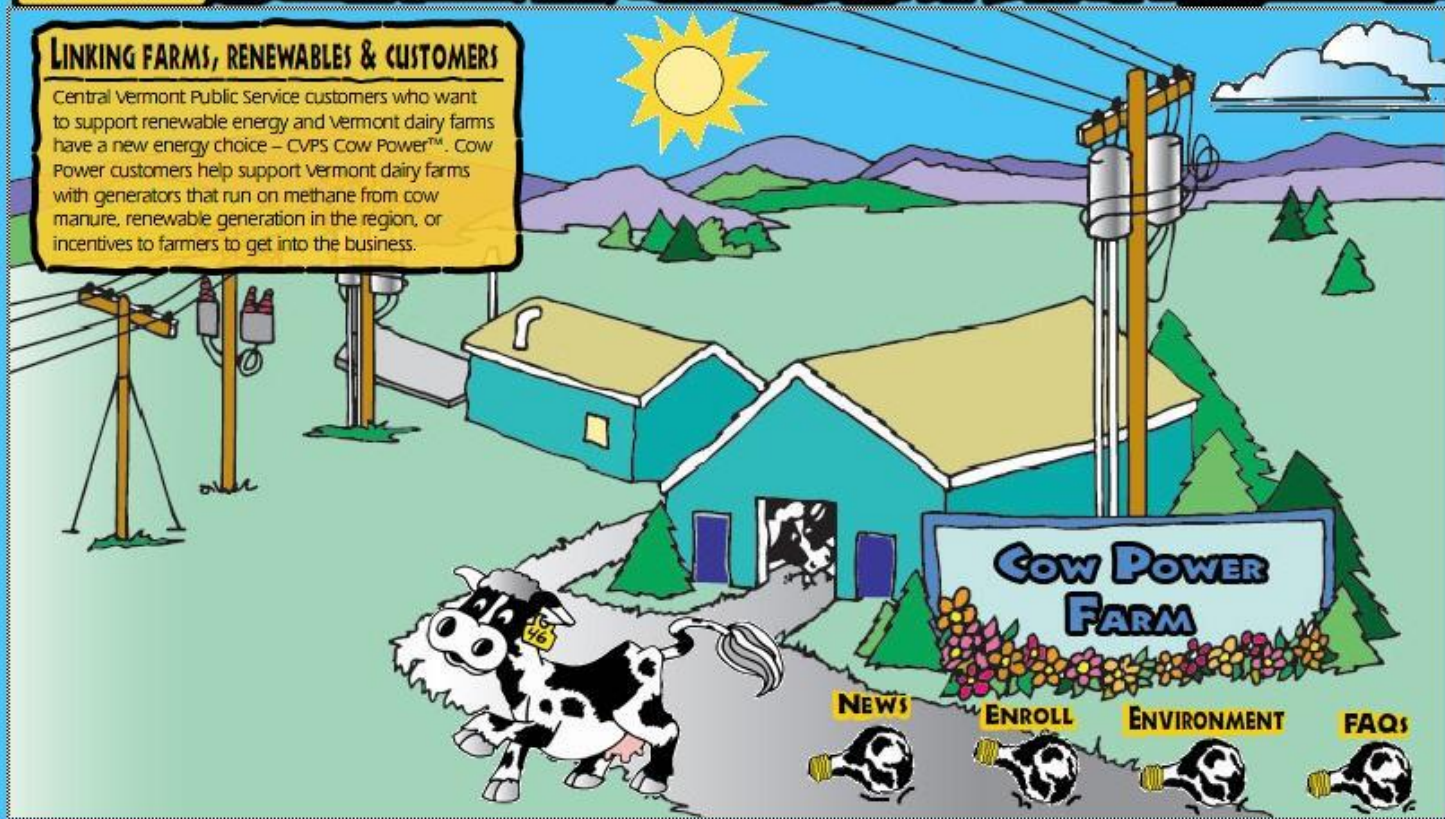
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providing renewable energy one cow at a time

LINKING FARMS, RENEWABLES & CUSTOMERS

Central Vermont Public Service customers who want to support renewable energy and Vermont dairy farms have a new energy choice – CVPS Cow Power™. Cow Power customers help support Vermont dairy farms with generators that run on methane from cow manure, renewable generation in the region, or incentives to farmers to get into the business.



CVPS Home | Copyright 2006 Central Vermont Public Service | 77 Grove St., Rutland, Vt. 05701 | Customer Information 800-649-2877 | Contact Cow Power

www.cvps.com



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Fibrowatt LLC is owned by [Homeland Renewable Energy](#) of Pennsylvania. Its management team is the only one in the world that has experience developing and operating poultry-litter fueled power plants.

This proven technology is now being introduced to select poultry-producing communities in the United States.

[Fibrominn](#), the nation's first poultry-litter fueled power plant, opened in Benson, Minnesota, in 2007.

[Fibrowatt Announces Presence on Three Social Networks](#)

Read the latest Email News Update announcing Fibrowatt's presence on three social networks: [Facebook](#), [Twitter](#), and [LinkedIn](#).

Read or download the full update [Fibrowatt Announces Presence on Three Social Networks](#). 

About Fibrowatt

Fibrowatt LLC was founded in 2000 by the same management team that built the world's first three poultry-litter fueled power plants in the United Kingdom in the 1990s. These plants, which were built in response to the poultry industry's need for a litter disposal alternative, generate homegrown renewable energy.

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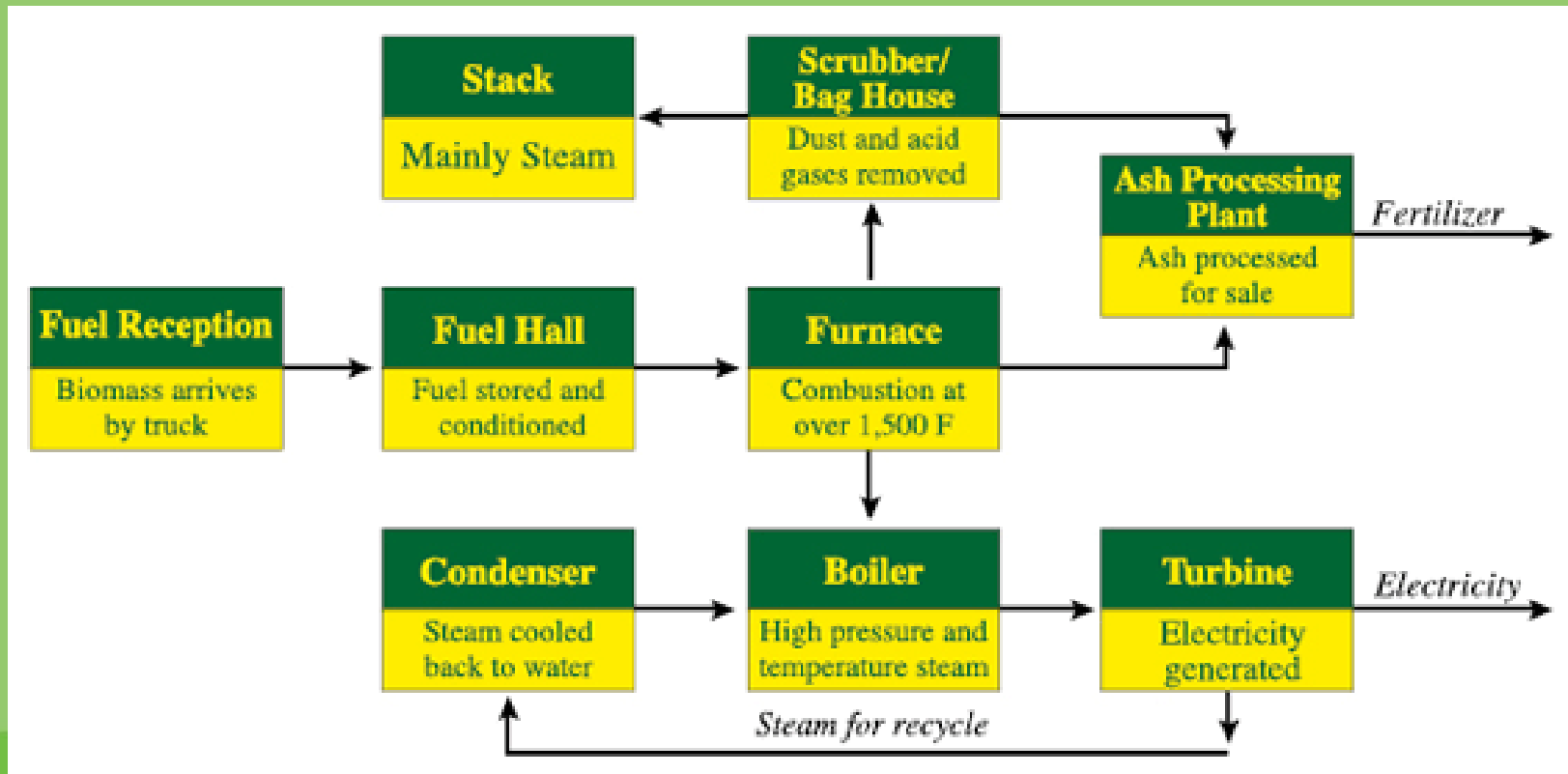


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Fibrowatt



Texas Dairy Composting



- Dairy Manure Export Support (DMES)
 - Processed 5 to 45,000 tons manure/mo
- Compost Manure Incentive Program (CMIP)
 - Reimburse compost costs for public entities (i.e. TX DOT) to stimulate creation of sustainable market
- **CONTACT:** Texas State Soil and Water Conservation Board (TSSWCB): TJ Helton at the TSSWCB at 254-773-2250, ext. 234, or thelton@tsswcb.state.tx.us.



Mark your calendar

2011 National Value-Added Agriculture Conference

June 26 - 28, 2011

Pittsburgh, PA

For more info RE: this presentation on ***Value Added Products and Alternative Manure Technologies in the Chesapeake Bay*** - contact Kristen Saacke Blunk, Penn State Ag & Environment Center, Cooperative Extension, kls386@psu.edu, 814-863-8756



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