



Water

Getting to Clean & Plentiful





BION ENVIRONMENTAL TECHNOLOGIES: SETTING THE PACE FOR NUTRIENT REDUCTION AT THE SOURCE.

Dairy farms are a large source of nitrogen and phosphorous leaching into waterways. Fixing that problem at the farm, rather than waiting for it to travel downstream into municipal water systems, can save millions for financially stressed towns.

Bion's system captures valuable nutrients at the source, funneling farm waste through a high-tech and bio-tech system that extracts valuable cellulose and nutrients.

For the farmer, the benefits include three sources of revenue:

- **Cellulose**, which can be sold to pellet makers for use as a renewable fuel; or can be used at the farm for animal bedding, preserving more valuable crops such as hay.
- **Fertilizer**, which is safe and clean to store in the winter months for use in local or global growing seasons.
- **Verified nutrient reduction credits**, which can be sold to utilities, municipal wastewater treatment plants and industries to meet storm water and municipal waste regulations.

Manure

Separator

Cellulose
(Bedding
or Energy)

Bioreactor

Centrifuge

Dry
Fertilizer

Liquid
Fertilizer

Bion's Process:

Dr. Jeremy Rowland, COO, and Dominic Bassanti, CEO of Bion described Bion's process.

- Animal waste is moved along a rotor that brings it to a separator.
- At the separator, cellulose — woody product — is extracted.
- The remainder travels through a bioreactor that uses advanced microbial processes to break the product down, much like composting breaks down organic matter.
- The final product is then sent to a centrifuge that separates liquid from dry product to be used as fertilizer.

All along the way, a proprietary SCADA (supervisory control and data acquisition) system monitors and even remotely controls the process. As Mr. Bassanti, said, "We know if anything is out of balance."

By verifying actual inputs and outputs, Bion is able to provide farmers with verified nutrient credits, along with accurate predictions of outputs.



Jeremy Rowland remotely monitoring an on-site system.



**TO VIEW VIDEO: GO TO
YOUTUBE> TGEINK > FROM FARM TO
CITY, KEEPING WATER CLEAN**

[HTTP://WWW.YOUTUBE.COM/
WATCH?V=SG1LI1XFJWG](http://www.youtube.com/watch?v=SG1LI1XFJWG)



Being smarter about energy isn't turning out lights and using less.

It's **investing** in a smarter infrastructure:

- ▶ Cleaner
- ▶ Cheap and Abundant
- ▶ More Reliable
- ▶ Safer

That's what we do.

We find new companies with low-cost, high-return technologies that make existing energy systems cleaner, cheap and abundant, more reliable and safer. Given the scale of existing infrastructure, these technologies offer massive "bang for the buck." Many are hidden in plain sight, and just need the right injection of capital or entrepreneurial leadership to unleash their potential. Join us as we survey the exciting opportunities in the emerging world of digital energy.

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Kreider Farms in Lancaster, Pennsylvania, installed the Bion system and are delighted with the results. Ron Kreider, president and CEO and 3rd generation leader of Kreider Farms, said,

"We installed Bion Environmental Technologies' equipment to reduce nitrogen and phosphorous flowing into the watershed. This provides significant improvements to our local public health and quality of life, and stimulates economic activity in our communities."

The installation, featured in the TGEink video, has proved the case for Bion Environmental Technologies.

Summing up, Mr. Bassanti mused that the Chesapeake Bay is operating under regulations set in 1972, while the science has evolved. He added,

"There's almost a complete disconnect between science and what we're doing now to clean water."

He believes municipalities are paying a lot but getting very little in return. He adds,

"Put it [water quality] up for bid. The agriculture industry will step in when they see the opportunity to sell credits like anyone else would."



Cellulose from
Bion's Separator.



Kreider Farms
Groundbreaking

John Hines, Deputy Secretary and Russell Redding, Secretary of Ag at PA DEP; Jeremy Rowland of Bion; Ron Kreider, Mike Brubaker (R) State Senator 36th District, State Representative Tom Creighton, and Executive Director of PennVest Dr. Paul Marchetti.

NEXT:

THE ENERGY EFFICIENT BUILDING

Buildings are now storage devices, energy generators and resource hoarders. In the next issue, we feature companies that are helping other companies do much, much more with less.

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