

# Creating Energy & Protecting the Environment

Division Director of Programs, Chris Rice  
Maryland Energy Administration



Maryland  
Energy  
Administration

# SMALL AGENCY WITH A LARGE MISSION

The mission of the Maryland Energy Administration is to promote affordable, reliable, cleaner energy for the benefit of all Marylanders.

# ANIMAL WASTE TO ENERGY



**Why Pursue Animal  
Waste to Energy  
Technology in Maryland?**

**The impact of agriculture on Maryland's economy amounts to \$8.25 billion annually. Approximately half of this amount is due to livestock production.**



The Potential for Nutrient  
Runoff From Animal  
Operations Can be  
Curtailed While Providing  
an Alternate Revenue  
Source for the Farmer



Maryland  
Energy  
Administration

A brown cow with horns stands in a lush green field, looking directly at the camera. The cow has a white face and a yellow ear tag with the number '0022'.

# WHY NOW?

# DRIVERS



Maryland  
Energy  
Administration

An aerial photograph of a river winding through a rural landscape with agricultural fields and some buildings. The text 'TOTAL MAXIMUM DAILY LOAD' is written in a smaller font above 'TMDL', which is written in a much larger font.

# TOTAL MAXIMUM DAILY LOAD TMDL

# The Phosphorus Management Tool PMT

# The Renewable Energy Portfolio Standard RPS



**The Energy  
Administration  
Works with The  
Department of  
Agriculture to Help  
Accomplish This Goal**



Maryland  
Energy  
Administration

# The MEA Animal Waste to Energy Program



**In Fiscal Year 2019 MEA has Made up  
to \$6M dollars Available to Assist in  
the Development of New On-Farm and  
Community Facilities**

# MEA has Currently Funded Five Projects in the State

PASSION LED US HERE

# Case Study

## Planet Found Energy Development, LLC



Maryland  
Energy  
Administration



## The Host Farm – Millennium Farm Worcester County, MD



## The AD + NCS Facility



# PFED's Patent-Pending Combined AD + NCS Process



## Introduction of Material

PFED's Combined AD + NCS fundamentally alters traditional manure management practices after poultry litter is delivered to covered storage. As opposed to allowing a slow composting process, PFED's system undertakes daily removal, energy production, and nutrient capture on the stockpiled litter.



## Automation & Verification



## Products

### Biogas

Biogas is captured as part of the anaerobic digestion process. It is the result of microbial processes and is primarily composed of methane, the chief constituent of natural gas. Like natural gas, it can be used to produce electricity, heat and refrigeration, or it can be upgraded to serve as a renewable fuel equivalent to compressed natural gas (CNG).



# Products

## High N:P Field Amendment

PFED's Field Amendment is a stable, peat-like mulch with a 4:1 – 6:1 nitrogen to phosphorus ratio. It is designed for application onto farm fields, and can be broadcast in exactly the same way (and with the same equipment) as poultry litter.

### Advantages

- High N:P Ratio compared to poultry litter (5:1 instead of 1:1)
- Very low odor (comparable to finished compost)
- Minimal nitrogen loss due to volatilization
- Low pathogenicity



# Products



## High N:P Potting Soil

PFED's potting soil is a stable, ultra-absorbent organic mix with an 8:1 – 10:1 nitrogen to phosphorus ratio. It can be used as a standalone media or mixed into mulch or existing soils to provide additional nutrients and water holding capacity.

## Advantages

**High 9:1 N:P Ratio.** Better suited to plant nutrient needs than general 1:1:1 N:P:K plant food and fertilizers.

**Water retention**

**Earthy odor**

**High levels of micronutrients important to plants such as sulphur and calcium**



# Products

## Phosphorus Fertilizer

PFED's phosphorus fertilizer was designed to be competitive with traditional P-based products on the market. It is 6% total phosphorus by dry weight, which is complemented by lower levels of plant-available nitrogen, potassium and other essential micronutrients.

### Advantages

Low moisture content

Equals or exceeds other P-based fertilizer products





# Maryland Energy Administration

[Energy.Maryland.gov](http://Energy.Maryland.gov)



Maryland  
Energy  
Administration