

# FibroShore: Policy Solutions for Large Scale Manure to Energy Projects



Manure to Energy Summit  
September 2011

# Track Record: UK Plants



## Eye

**Commissioned: 1992**

**Design Output: 12.7MW**

**Feedstock: poultry litter & biomass**

**Fuel Usage: 170,000 t/yr**



## Glanford

**Commissioned: 1993**

**Design Output: 13.5MW**

**Feedstock: Poultry litter and biomass**

**1999 converted to combust MBM**



## Thetford

**Commissioned: 1998**

**Design Output: 38.5MW**

**Feedstock: poultry litter & biomass**

**Fuel Usage: 500,000 tons/yr**

## Fibrominn Biomass Power Plant



<b>Commissioned:</b>	<b>October 2007</b>
<b>Design Output:</b>	<b>55MW</b>
<b>Feedstock:</b>	<b>Poultry Litter &amp; Woody Biomass</b>
<b>Fuel Usage:</b>	<b>&gt; 600,000 Ton/Yr</b>

- **Fibrowatt LLC**

- a Pennsylvania-based developer, builder and operator of electrical power plants fueled by poultry litter and other agricultural biomass
- First 3 units in the world were developed by Fibrowatt in the UK, with latest being developed by Fibrowatt in Benson, MN

- **Proven Technology**

- Over 20 years of designing, building and operating poultry litter fueled power plants, during which we have:
  - combusted 8 million tons of agricultural biomass
  - produced over 4 million megawatt-hours
  - sold over 800,000 tons of ash fertilizer
  - complied with both US and UK regulatory requirements
    - including emissions, safety, biosecurity etc

## Anaerobic Digesters

- Developers of large scale co-digestion AD systems
- HBE provides development, permitting, construction, operations and maintenance services for AD projects
- HBE also provides substrate procurement services



Five Star Dairy Facility - Elk Mound, WI



Norswiss Dairy Facility - Rice Lake, WI

# FibroShore Project Description



- **Design Rating: 55 MW**
- **Total Expected Capital: \$300 million**
- **Fuel Requirements:**
  - Up to 465,000 tons litter per year
  - 80,000 tons wood waste per year
- **Ash Fertilizer Generation**
  - 72,000 tons of ash generated
- **Employment**
  - Plant Operations: 32 personnel
  - Ash Fertilizer Operations: 5 personnel



## **Operation of FibroShore will result in:**

- Significant Nitrogen and Phosphorous loading reduction to the Bay from poultry litter
- Significant reductions of GHG emissions and PM 2.5 emissions
- Supporting Maryland's capacity to achieve its short term and long term Bay Compliance Goals
- Improved nutrient management on the Eastern Shore
- Sustainability of the poultry industry and preservation of Ag-sector job
- Production of low cost renewable energy on the Eastern Shore

# Nutrient Reduction Analysis



<b>MD WIP to 2017</b>	<b>FibroShore</b>
<u>Reduction Goal</u>	<u>MD Reduction Achieved</u>
8.029 Million N lb/yr	4.817 Million N lb/yr
0.410 Million P lb/yr	1.757 Million P lb/yr



# Total N and P Mitigation



**Fibrowatt Removes 465,000  
Tons of Litter Per Year**

**Nitrogen in Litter  
32.7 million lbs/yr**

**Phosphorous in Litter  
12.1 million lbs/yr**

**32.3 million lbs/yr N  
converted to N<sub>2</sub>**

**12.1 million lbs/yr  
preserved in ash and  
removed from Bay  
Watershed**

# MD WIP 2017 Compliance Cost



## MD WIP 2017 Compliance Cost

Sector	Cost
<b>TOTAL (2017)</b>	<b>\$10,703,508,000</b>
<b>Point Sources/Urban Storm Water</b>	<b>\$7,432,000,000</b>
<b>Septics</b>	<b>\$474,400,000</b>
<b>Agriculture - Managing the Land to Improve Water Quality</b>	<b>\$209,695,000</b>
<b>Agriculture - Managing Animal Wastes and Phosphorus</b>	<b>\$19,140,000</b>
<b>Agriculture - Managing Fertilizer and Manure Applications</b>	<b>\$42,810,000</b>
<b>Natural Filters on Public Land</b>	<b>\$24,663,422</b>
<b>Air</b>	<b>\$2,600,800,000</b>

**Fibrowatt projects will succeed when long-term predictable cash flows are guaranteed; this is dependant on policy solutions that address:**

- Regulatory consensus on the magnitude of our environmental benefits (N and P reduction);
- Consensus with State and Federal authorities on the \$ value of pollution control achieved with our facilities;
- Monetizing the environmental benefits of our project and/or monetizing our supply of renewable power; and
- Securing long term pollution control services agreement or long term power purchase agreement

## **Bay States should require utilities to purchase power under long-term power purchase agreements including the following basic requirements:**

- Supply of renewable energy,
- Provision of significant pollution control services (N and P reductions),
- Limited to application of commercially proven technologies,
- Incorporation of structural mechanisms (within the PPA) allowing for viable project financing,
  - Precise Allocation of Cost and Revenues
  - Effective Management of Fuel Risk
- Modification to CPCN regulations allowing for approval based on “monetary benefit externalities”

# Contact Information



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