

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



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

- **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



MD WIP to 2017	FibroShore
<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 N₂**

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

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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