BIOFerm™ Energy Systems

Dry Fermentation Anaerobic Digestion: UW-Oshkosh

Christine McKiernan
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Anaerobic Digestion for Organic Wastes
Albany, New York
BIOFerm™ Energy Systems
A Company of the Viessmann Group

- BIOFerm™ is a wholly owned subsidiary of the Viessmann Group, which was founded in 1917
- Comprehensive product range of heating and climate control technology
- $2 billion worldwide company

- North American HQ in Madison, WI since 2007
- Designs and builds biogas plants
- Over 330 installations worldwide
Offering AD Systems for Most Organic Materials

Solid Waste Products
E.g. municipal organic waste, food waste

Liquid Waste
E.g. liquid manure

Energy Crops
E.g. corn and grass silage

Mixed Wastes
E.g. liquid manure and energy crop

Liquid Waste
E.g. liquid manure

Mixed Wastes
E.g. liquid manure and energy crop

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Anaerobic Digestion – Dry Fermentation

Dry Fermentation Process Layout
### Plant Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology</td>
<td>Dry Fermentation</td>
</tr>
<tr>
<td>Electrical capacity</td>
<td>370 kW</td>
</tr>
<tr>
<td>Thermal capacity</td>
<td>495 kW</td>
</tr>
<tr>
<td>Input material</td>
<td>up to 8000 tons ag. waste/SSO</td>
</tr>
<tr>
<td>Fermenters</td>
<td>4</td>
</tr>
<tr>
<td>Length x Width x Height</td>
<td>65’ x 23’ x 13’</td>
</tr>
<tr>
<td>Construction start date</td>
<td>September 2010</td>
</tr>
<tr>
<td>Beginning of operations</td>
<td>Fall 2011</td>
</tr>
</tbody>
</table>
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Pre-Consumer Food Waste
- Roughly ~15% of Feedstock
- Total Solids ~22%
- Minimal Contamination

Additional Feedstocks
- Agricultural Bedding Waste
- City Yard Waste
- Good Structure
- Higher Total Solids (>25%)
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Mixing Lobby

- Contained Emissions
- Substrates & Digestate Mixed
- Protected from Elements

Fermentation Chambers

- 70’ x 23’ x 15’
- Internal Percolation System
- Biogas Collection/Sampling
- 28-day retention time
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**Biogas Storage Bag**

- Collection from PST & Fermenters
- Temporary Storage
- Fed to CHP

**Biofilter**

- Scrubs Indoor Emissions
- Eliminates Odors
- Biological with Lava Rock Media
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Combined Heat & Power

- 2G Cenergy Container
- 370 KW_e / 495 KW_th MAN Engine
- Moisture Removal & Carbon Filtration Unit
- Equipped with Emergency Flare
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Start-Up Challenges

• Securing Adequate Feedstock Contracts
  Ideal Structure and Characteristics

• Permitting Challenges
  Air
  Solid Waste
  Construction

• Operator Handover and Training
  New Technology
Continuous Monitoring

- Feedstock Amount & Type

- Sensors
  - Temperature
  - Pressure
  - Flows
  - Biogas Quality

- Laboratory Analysis of Percolate/Feedstock/Digestate
  - pH/TS/VS/porosity/density

- CHP Stability and Performance

- Daily Walkthrough & Maintenance
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**UW - Oshkosh Fermenter Loading**

- Digested solids/recycled [US tn]
- Brown yard waste [US tn]
- Press fiber [US tn]
- Green yard waste [US tn]
- Food Waste [US tn]
- Animal bedding material [US tn]

**Tons Loaded per Week**

**Week**

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37

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Thank you!

BIOFerm™ Energy Systems
617 N. Segoe Road, Suite 202
PO Box 5408
Madison, WI 53705
Tel (608) 467-5523

www.biofermenergy.com/us
info@biofermenergy.com
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