

# BIOFerm™ Energy Systems

## Dry Fermentation Anaerobic Digestion: UW-Oshkosh



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June 20, 2012

Anaerobic Digestion for Organic Wastes

Albany, New York

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# BIOFerm™ Energy Systems

## A Company of the Viessmann Group



VISSMANN 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



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# Offering AD Systems for Most Organic Materials

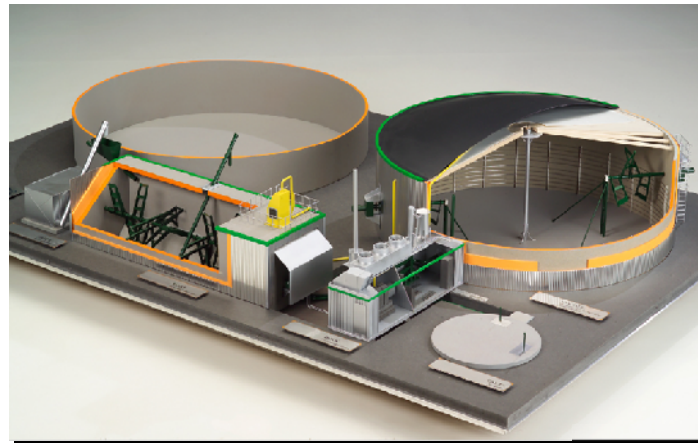
Solid Waste Products  
E.g. municipal organic waste,  
food waste



Liquid Waste  
e.g. liquid manure

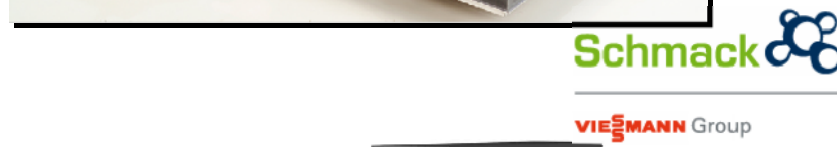
Energy Crops  
e.g. corn and grass silage

Mixed Wastes  
e.g. liquid manure and energy crop



Liquid Waste  
e.g. liquid manure

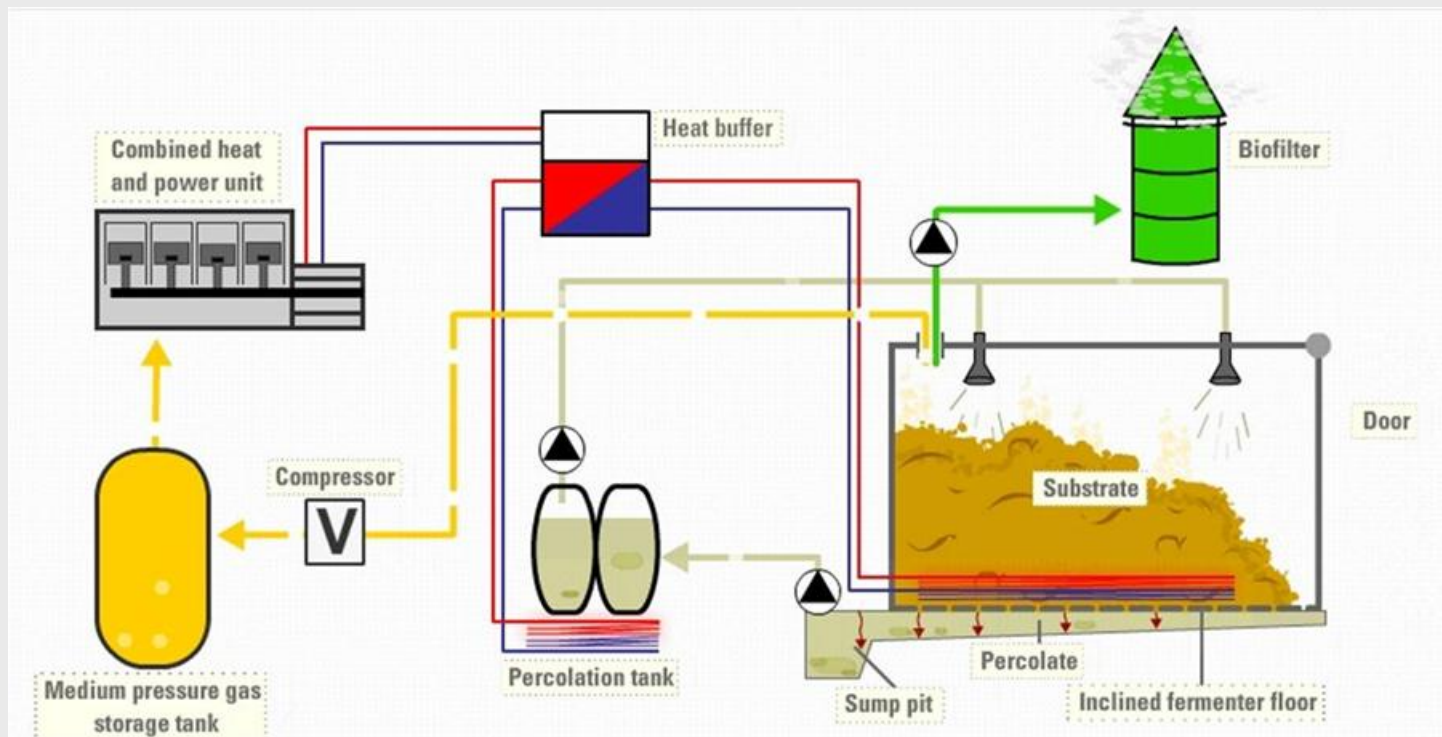
Mixed Wastes  
e.g. liquid manure and energy crop



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# Anaerobic Digestion – Dry Fermentation

## Dry Fermentation Process Layout



## University of Wisconsin – Oshkosh

### Plant Parameters

Technology: Dry Fermentation

Electrical capacity: 370 kW

Thermal capacity: 495 kW

Input material: up to 8000 tons  
ag. waste/SSO

Fermenters: 4

Length x Width x Height: 65' x 23' x 13'

Construction start date: September  
2010

Beginning of operations: Fall 2011



## UW-Oshkosh – Dry Fermentation



### 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%)



## UW-Oshkosh – Dry Fermentation



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



## UW-Oshkosh – Dry Fermentation



Biogas Storage Bag

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

Biofilter

- Scrubs Indoor Emissions
- Eliminates Odors
- Biological with Lava Rock Media



## UW-Oshkosh – Dry Fermentation

### Combined Heat & Power



- 2G Cenergy Container
- 370 KW<sub>e</sub> / 495 KW<sub>th</sub> MAN Engine
- Moisture Removal & Carbon Filtration Unit
- Equipped with Emergency Flare

## UW-Oshkosh – Dry Fermentation

### Start-Up Challenges

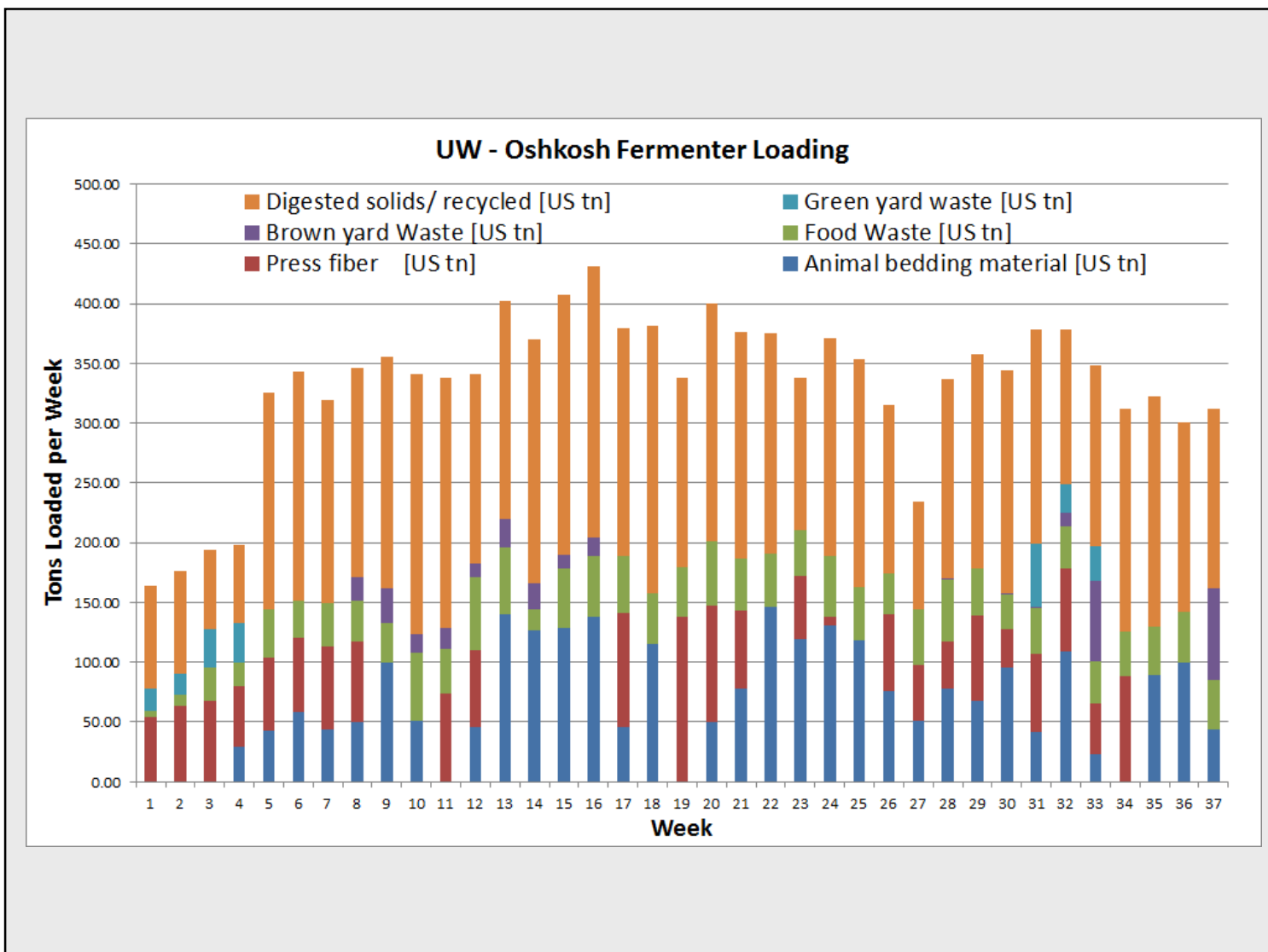
- Securing Adequate Feedstock
  - Contracts
  - Ideal Structure and Characteristics
- Permitting Challenges
  - Air
  - Solid Waste
  - Construction
- Operator Handover and Training
  - New Technology

## UW-Oshkosh – Dry Fermentation

### 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

# UW-Oshkosh – Dry Fermentation



**Thank you!**



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