BIOFerm™ Energy Systems

Dry Fermentation Anaerobic Digestion: UW-Oshkosh

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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

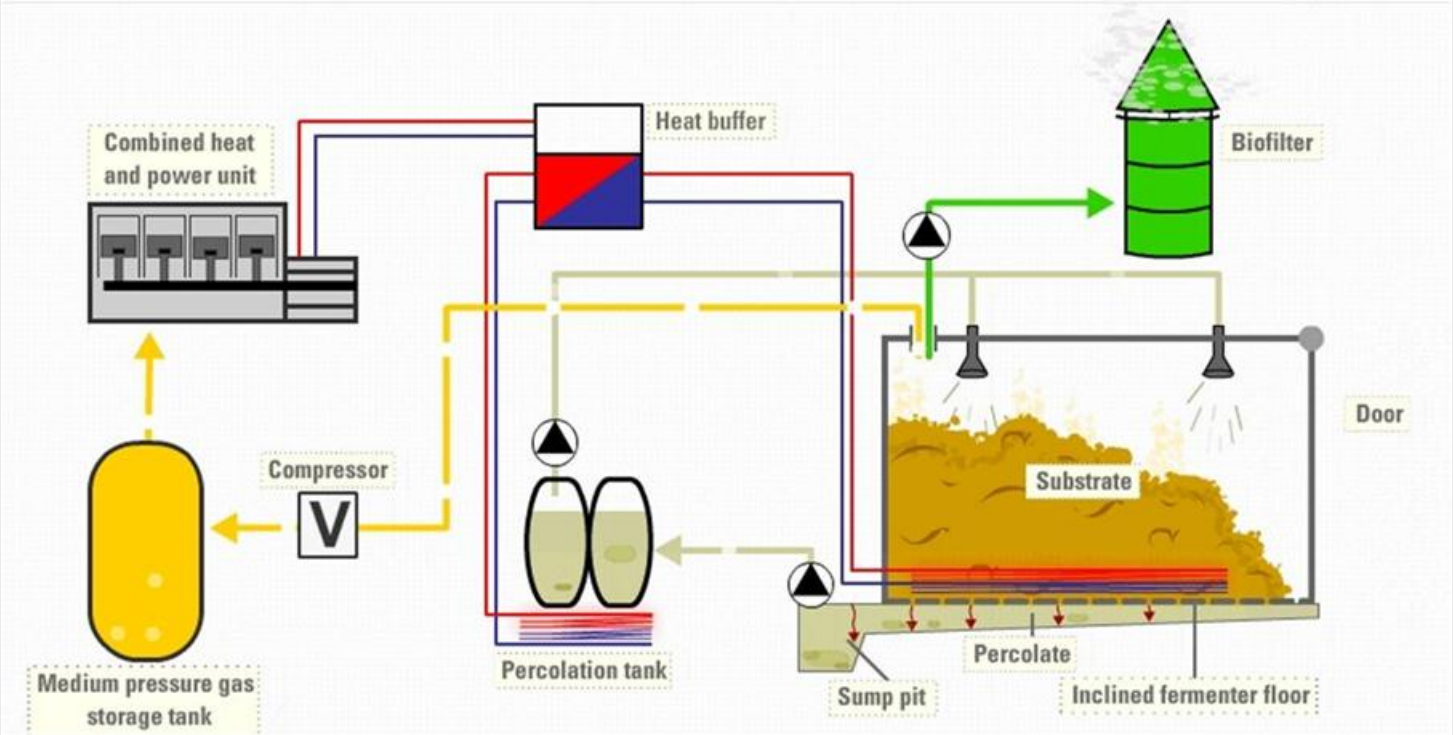
Mixed Wastes
e.g. liquid manure and energy crop

Liquid Waste
e.g. liquid manure

Mixed Wastes
e.g. liquid manure and energy crop

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: ag. waste/SSO	up to 8000 tons
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%)

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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

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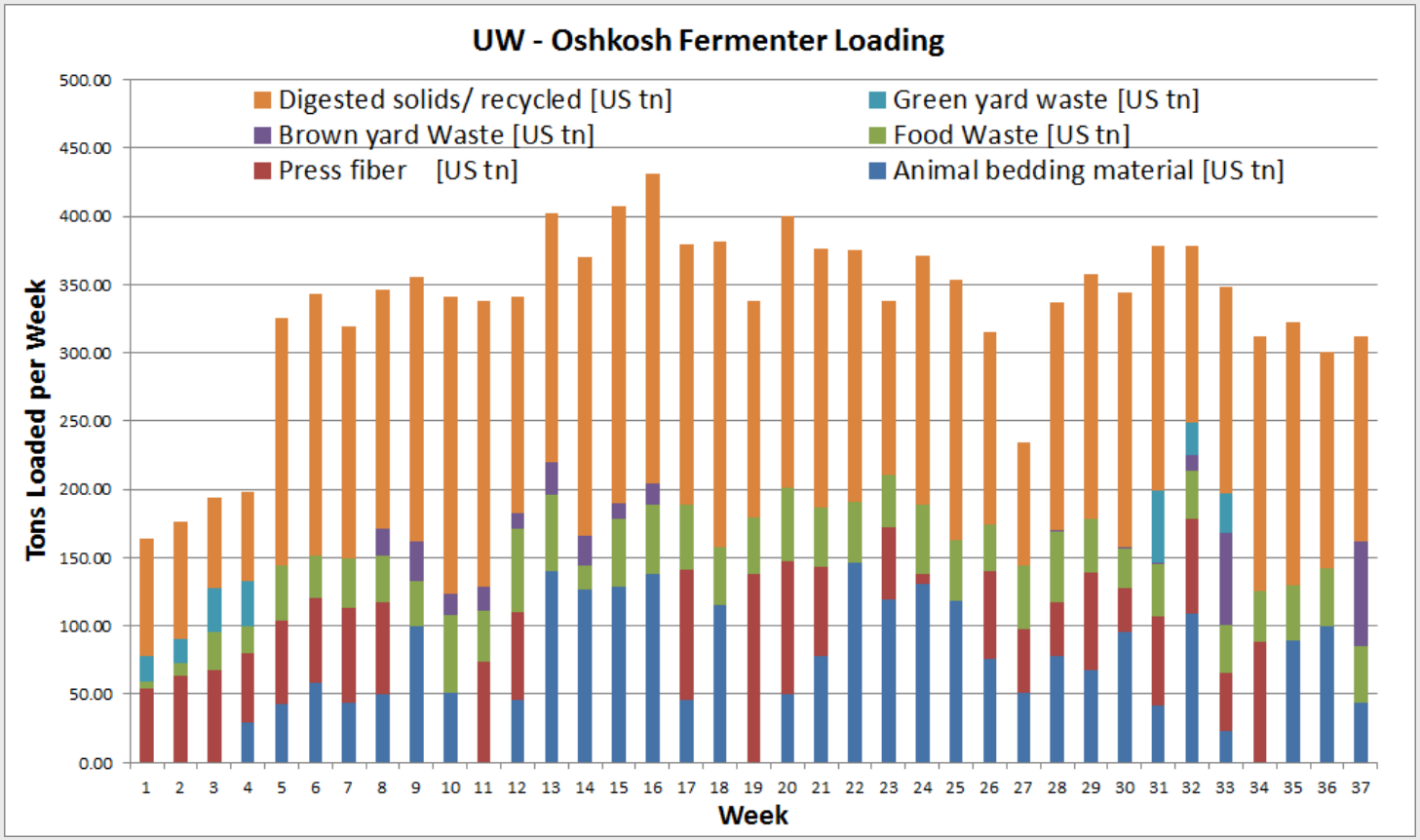
Continuous Monitoring

- 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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