



**VIESSMANN** Group

# Maximizing Digestate Product Value for Full-Benefit Wastewater Treatment Plant Anaerobic Digestion

## NEBRA

Christine McKiernan  
VP Technology and Development  
BIOFerm™ Energy Systems



# BIOFerm™ Energy Systems – Viessmann Group Member

## North American Anaerobic Digestion and Gas Upgrading

Expertise



Turnkey anaerobic digestion & gas upgrading systems

---

Commitment



System performance guarantee

---

Experience



450+ anaerobic digestion & 60+ gas upgrading installations

---

Reputation



High repeat business

---

## Case Study - KB BioEnergy at Akron, OH's WWTP

### Current Operations

- **Processes 100% of City of Akron's biosolids**
  - 12 MGY of 5%TS biosolids slurry (~44,000 wet tons/year 29-30%TS) from primary sludge gravity thickener + secondary sludge belt filter thickening
  - Currently processes ~15,000 tons/year dried biosolids

- Biosolids pumped to AD facility for belt press thickening prior to feeding digesters (~200,000 gpd at 5-8%TS)



# Case Study - KB BioEnergy at Akron, OH's WWTP

## Current Operations

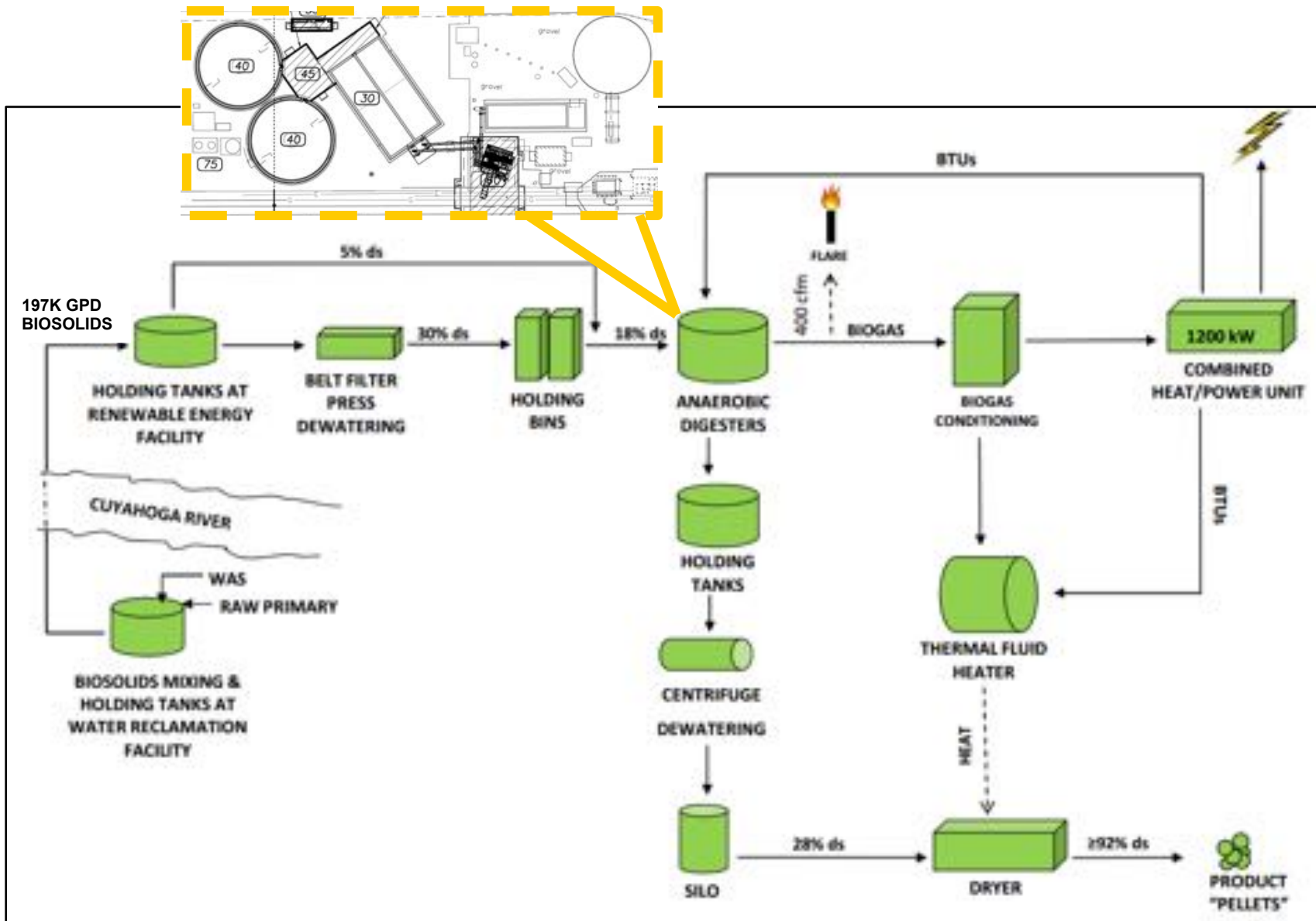


Enough electricity to power nearly 1,600 homes

- **Phase I:** 1 COCCUS® CSTR tank + 1 EUCO® plug-flow digester; 330 kW<sub>el</sub> capacity
- **Phase II:** 2 COCCUS® CSTR tanks + 2 EUCO® plug-flow digesters; 1.8 MW<sub>el</sub> capacity
- 1 All-in-One (AIO) technical container, 3 additional 600 kW MWM engine
- Facility uses 10% of energy created from biogas
- Other 90% used to power Akron public service buildings

# Case Study - KB BioEnergy at Akron, OH's WWTP

## Current Operations



PFD Courtesy of [www.kbbioenergy.com](http://www.kbbioenergy.com)

# Case Study - KB BioEnergy at Akron, OH's WWTP

## Two Step Digestion - Step One EUCO®



### EUCO® - Mixed plug flow anaerobic digester

- Blended feed 5% + 28% solids - ~18%-20% TS
- Initial hydrolysis through methanogenesis
- ~50% biogas production

# Case Study - KB BioEnergy at Akron, OH's WWTP

## Two Step Digestion - Step Two COCCUS®



### COCCUS® – complete mix CSTR anaerobic digester

- Input from EUCO®, 12-15%TS
- Complete digestion
- ~50% biogas production

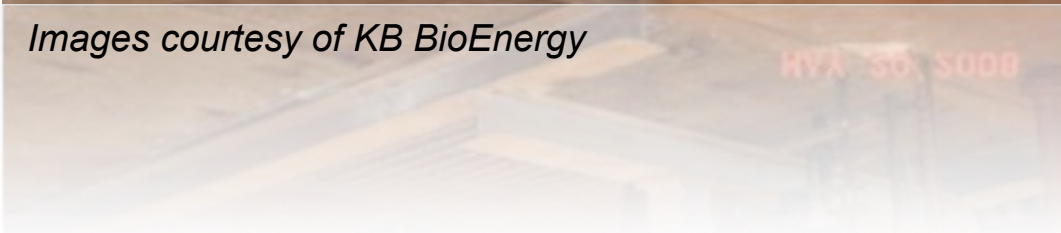
## Case Study - KB BioEnergy at Akron, OH's WWTP

### Dewatering Digestate



*Images courtesy of KB BioEnergy*

- COCCUS® – digestate discharge ~10%TS
- 3 D5LL Andritz centrifuges
- 2,500 dry lb/hr per centrifuge
- Cake - ~28-30%TS





# Case Study - KB BioEnergy at Akron, OH's WWTP

## Drying Digestate Cake



- Paddle dryer – Komline
- 10,000 wet lb/hr feeding
- Product solids - ~92%TS
- Class A Exceptional Quality
- 10,0000 yd<sup>3</sup>/yr



*Images courtesy of KB BioEnergy*

# Case Study - KB BioEnergy at Akron, OH's WWTP

## Regulatory Compliance

	Average	Regulatory Limit
Arsenic	9.99	41
Cadmium	3.87	39
Copper	353	1500
Mercury	.263	17
Molybdenum	9.74	18
Nickel	25.5	420
Lead	50.8	300
Selenium	.903	100
Zinc	1560	2800

- Heavy metals – meets EQ status
- Pathogen reduction - particles >80C
- Vector attraction – dry solids >90%
- Fecal coliform - <1,000 MPN

# Case Study - KB BioEnergy at Akron, OH's WWTP

## Product Use!



*Images courtesy of KB BioEnergy*



- Twinsburg School System – athletic fields
- Turf plot tests on OARDC grounds – greening due to micronutrients
- TechnaGro Advanced – 11,063 yd<sup>3</sup> sold!

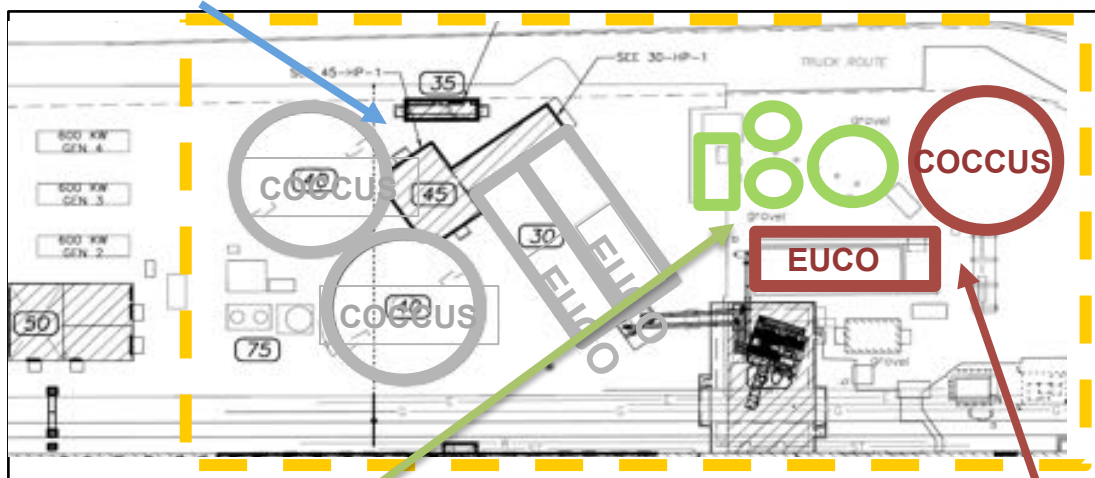
# Case Study - KB BioEnergy at Akron, OH's WWTP

## Next Steps

- Continued product testing
- Food waste co-digestion to be incorporated



### Phase II Anaerobic Digesters



**New food waste receiving/prep  
& storage tanks**

**Phase I Anaerobic Digesters**

# Case Study - KB BioEnergy at Akron, OH's WWTP

## Summary



- **Phase 1:** \$7 million capitol investment
  - Partially offset by City of Akron's investment: \$835,000, funded by annual compost sales of \$250,000
- **Phase 2:** \$32 million total capitol investment, including complete facility upgrades
- Produces pelletized fertilizer for use in the City's garden program

## Our Purpose

Redefining “Waste”



At BIOFerm™ we see our role as “re-definers” of waste. We hope to provide the tools for industries to make the most of the resources within their reach—

*nothing is waste until you waste it.*

# Copyright

©2016 BIOFerm™ USA, Inc.

All materials in this presentation are the property of BIOFerm™ Energy Systems unless otherwise specified. Without BIOFerm™ Energy Systems' prior written permission, you may not copy, modify, display, or prepare derivative works based upon the materials in this presentation. The BIOFerm™ logo, and other trademarks are registered trademarks of BIOFerm™. Other BIOFerm™ graphics, logos, page headers, button icons, and scripts are trademarks or trade dress of BIOFerm™. Other brand and product names mentioned herein may be registered or unregistered trademarks of their respective owners and are annotated.

BIOFerm™ Energy Systems  
440 Science Drive, Suite 300  
Madison, WI 53711

608-467-5523

[www.BIOFermEnergy.com](http://www.BIOFermEnergy.com)  
[info@BIOFermEnergy.com](mailto:info@BIOFermEnergy.com)