

Energy Production from Anaerobic Digestion of Dairy Manure

The Madison Concourse Hotel

Madison, WI

September 28 & 29, 2009

Monday - September 28, 2009

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| 7:30 – 8:00 a.m. | Course Registration |
| 8:00 – 8:10 a.m. | Welcome & Course Introduction
Robert Burns, Ph.D., P.E.
Iowa State University |
| 8:10 – 8:45 a.m. | Current Status of Manure Anaerobic Digestion in the US and Beyond
Robert Burns, Ph.D., P.E.
Iowa State University <ul style="list-style-type: none">• Manure digester trends in the United States• Manure digester trends in Europe, Asia and South America• Continuing challenges• Current opportunities |
| 8:45 – 9:30 a.m. | Energy Use and Production on US Dairy Farms
Curt Gooch, P.E.
Cornell University <ul style="list-style-type: none">• Overview of energy use on dairy farms• Electrical demand of dairy farms• Biogas production potential• Conversion of biogas to electrical energy• Comparison of farm electrical use vs. electricity production• Data review from monitored New York farms |
| 9:30 – 10:15 a.m. | Using Biochemical Methane Potentials and Anaerobic Toxicity Assays
Lara Moody, P.E.
Iowa State University <ul style="list-style-type: none">• Description of BMPs and ATAs• Utilization of assays in the planning process• Assay process• Interpretation of the results |
| 10:15 – 10:45 a.m. | Break – In Exhibitor Area |
| 10:45 – 11:30 a.m. | Sand-Manure Separation Pre-Anaerobic Digestion
Andrew Wedel
McLanahan Corporation <ul style="list-style-type: none">• Key elements of successful sand removal systems• Dilution requirements• Limits of sand separation• Characterization of bypass sand |
| 11:30 – 12:15 a.m. | Geosynthetic Biogas Collection Covers
Andrew Mills
Layfield Geosynthetics and Industrial Fabrics Ltd. <ul style="list-style-type: none">• Types of covers• Materials used for covers• Installation and maintenance• Adapting covers for tanks• Cover costs |
| 12:15. – 1:15 p.m. | Lunch – Provided on Site |
| 1:15 – 1:45 pm. | Case Study - Manure Digester HDPE Biogas Collection Cover
Van Dobbs
Plastic Fusion Fabricators |

- 1:45 – 2:15 pm. Case Study - Manure Digester EPDM Biogas Collection Covers
Jeff PanKonie
Firestone Specialty Products
- 2:15 – 3:00 p.m. Dairy Derived Biomethane Gas Cleaning Options and Costs
Curt Gooch, P.E.
Cornell University
- Composition of biogas
 - Overview of biogas clean up options
 - Matching clean up options to biomethane end use
 - Economics of applicable biogas clean up system options
- 3:00 – 3:30 p.m. Break – In Exhibitor Area
- 3:30 – 4:15 p.m. Biogas Utilization Options
Jeff Van Voorhis
Symbiont
- Biogas collection
 - Safety and design standards
 - Common biogas utilization methods
 - Emerging biogas utilization methods
- 4:15 – 5:00 p.m. Selection and Operation of Biogas Engine Generators
Thomas Elsenbruch
GE Energy
- Digester biogas engine characteristics
 - Factors for high efficiency and reliability
 - Criteria for reciprocating engines in biogas plants
 - Solutions to avoid biogas impurity issues
 - Engine service to optimize costs and plant availability
- 5:00 – 5:30 p.m. Dairy Engine Generator Electrical Production Case Study
Dan Nemke – General Manager
Clear Horizons
- 5:30 – 6:30 p.m. Reception – In Exhibitor Area

Tuesday - September 29, 2009

- 8:00 – 8:45 p.m. Connecting to the Electrical Grid
Alliant Energy
Mark Kingland
- Connection to an electrical grid
 - Necessary agreements
 - Information needed by utility for interconnection
 - Steps for connecting to the grid
 - “Net Metering” vs. “Avoided Cost”
- 8:45 – 9:30 a.m. Direct Use of Biogas on the Farm
Norma McDonald – Operating Manager
Phase 3 Renewable
- Assessing conventional energy use
 - Estimating system parasitic load
 - Replacing conventional heat, power and fuel
- 9:30 – 10:15 a.m. Marketing Biogas off the Farm
Brandon Moffat
StormFisher Biogas
- Direct injection in the pipeline
 - Co-location near a biogas consumer
 - Benefits and challenges

- 10:15 – 10:45 a.m. Break – In Exhibitor Area
- 10:45 – 11:30 a.m. Marketing Biogas off the Farm and Direct Use – Case Studies
Norma McDonald – Operating Manager
Phase 3 Renewable
- 11:30 – 12:15 Marketing Carbon Credits
Scot Subler
Environmental Credit Corp.
- Carbon markets – voluntary, pre-compliance, compliance
 - Offset project protocols and programs
 - Monitoring, verification, and registration of credits
 - Aggregators and transaction costs
 - Contract types and marketing strategies
- 12:15 – 1:15 p.m. Lunch – Provided on Site
- 1:15 – 2:00 p.m. Economic Evaluation of Digester Implementation on Dairy Farms
William Lazarus, Ph.D.
University of Minnesota
- Spreadsheet-based digester economic calculators
 - Using the calculators to examine factors affecting profitability
 - Considering the options: construction delay and future expansion
- 2:00 – 2:45 p.m. US EPA AgStar Program Resources
Chris Voell
U.S. Environmental Protection Agency
- Determining good candidates for digester projects
 - AgSTAR resources to enable project development
 - Overview of FarmWare - software for digester project feasibility
 - National overview of project development
 - Options for biogas capture and use
 - Value-added aspects of digester projects
- 2:45 – 3:00 p.m. Break – In Exhibitor Area
- 3:00 – 3:45 p.m. Federal Cost Sharing Opportunities for Dairy Anaerobic Digester Systems
Barry Kintzer, P.E.
- Environmental Quality Incentive Program (EQIP)
 - Tax Credits
 - American Recovery and Reinvestment Act
 - USDA Renewable Energy & Energy Efficiency Improvements Program
 - Department of Energy Grants and Loans
- 3:45: – 4:30p.m State Cost Sharing Opportunities for Dairy Anaerobic Digester Systems
Larry Krom
Wisconsin Focus on Energy
- Overview of Wisconsin's biogas program
 - Summary of other state programs
 - Performance measurement of WI funded biogas projects
 - Incentive structure for WI biogas projects
 - Achievable biogas potential and installation goals for WI