STATUS OF ANAEROBIC DIGESTERS IN NEW YORK

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Currently in New York there are:

- 6 Operating digesters
- 4 Digesters down for cleanout or refurbishing
- 1 Digester in start-up *(duck manure)*
- 4 Digesters under construction
- 3 Centralized digesters in design/financing phase
- 9 Digester projects in various stages of contract negotiation, feasibility study or on hold

Summary: 11 built, 7 likely in the next 2-3 years.

27 TOTAL Possible in the next ~5 years
STATUS OF DIGESTERS IN NEW YORK
March 2006

Legend
- Green Circle: Operating Digesters
- Blue Star: Start-up
- Blue Triangle: Under Construction
- Red Circle: Down for Refurbishing

Created by Jianguo Ma, Cornell University, March 2006
“We are just at the beginning of the methanogenic era.”

Prof. William Jewell,
Dept. of Biological & Environmental Engineering
Cornell U. - Sept. ’04
FIRST GENERATION

1978 - 1985
Jewell 2-Cow Pilot Digester
1974-1978
Jewell Plug-Flow Digester
Harford, NY  1978-1986

- Innovation: earthen-supported unit with low-cost flexible liner
- Originally designed for 50 cows
Agway Farm Research Center
Tully, NY  1981-1998

• Sized for 150 cows
• Operated for 17 years, until farm was sold
• Dr. Stanley Weeks

Photo courtesy Dr. Stanley Weeks.
Cooperstown Holstein
1985 - 2004

• For odor control (close to town)
• Sold biogas to nearby nursing home for 10 yrs.
• Generated electricity for 1 yr., then had various engine problems
• After nearly 20 years of biogas production, roof developed a leak

“Metha-Store” mixed digester

Photo courtesy
Dr. Stanley Weeks.
SECOND GENERATION

1997 to Present
AA Dairy, Candor, NY
1997 to Present

- Plug-flow with flexible cover
- Sized for 1,000 cows
- Reduced cost by retrofitting used gen-set
Farber Farm, East Jewett, NY
2001-2005

- Fixed film digester 2001-2003 (corrugated plastic drainage pipe)
- Smaller digester to reduce capital costs; 100 cows
- Problem: calcite deposits → drainage pipe removed
- High-rate vertical flow digester 2003-2005
- Currently down for cleanout
Dairy Development International
Homer, NY  2001- Present

• Original plan was to generate electricity using microturbines (lower emissions, quieter)
• Learned a lot about gas management
• Current plan: Ingersoll Rand bringing in their own microturbines, will purchase the gas
Matlink Dairy 2002-2005
Ridgeline Farms 2005 to Present
Clymer, NY

• Complete mix digester
• Ted Mathews: food waste tipping fee “success story” (and greatly increased biogas production)
• Bob and Jenny Bell: challenge to re-establish food waste contracts
Noblehurst Farms
Pavilion, NY 2003 to Present

• “Twin” plug-flow hard-top digester with parallel tanks
• Some sealing issues initially
• Recent engine rebuild; challenge maintaining digester temperature during cold spells (heat exchanger problems)
Twin Birch Dairy
Skaneateles, NY  2003-2004

- Plug-flow hard-top with power plant on top
- Corrosion problems with microturbines and compressors
- Successful odor control. Currently refitting.
Spring Valley Farm
Castleton, NY  2003-2005

• Innovation: Retrofit an existing manure storage to capture biogas
• Made biogas for ~ 2 yrs.
• Problems: sealing cover; manure-sand separation
• Currently down for cleanout

Sand bedding
EL-VI Farms
Newark, NY  2004 to Present

• Initially built for odor control, not energy production, so separates pre-digestion
• Built with farm labor to control costs
• Some start-up difficulty, solved by recordkeeping and feeding the digester more frequently
Patterson Farms  
Auburn, NY  2005 to Present

- Complete mix digester, flat soft-top
- Manure mixed with whey waste (tipping fees)
- Separated manure solids used for bedding
Crescent Duck Farm
Aquebogue, NY – In Startup

• The first duck manure digester
• Actually a sequencing batch reactor, with both aerobic and anaerobic phases

Photo courtesy Diamond Kongoletos

Anaerobic tank
Digesters Under Construction

Morrisville State College  
Sheland Farms

Emerling Farms  
Sunny Knoll Farm
2006 - 2007
Three Centralized Digesters

- Cayuga Regional Digester, Auburn
- Global Common Digester, Auburn
- Perry Community Digester

These digesters will process the manure from multiple dairies.
Issues To Face Going Forward for Anaerobic Digestion of Dairy Manure

- Improving the financial climate for digesters
- Green power, carbon credits, how to credit offsets for methane destruction
- Potential for codigestion with food waste, and constraints due to nutrient imports
- Standards for monitoring and data collection to allow better comparisons between systems
- Improved separation and solids management
- **SAFETY**
Safety Around Manure Systems

**DANGER**
DEADLY MANURE GASES POSSIBLE

DEATH MAY BE IMMEDIATE!

ENTER PIT ONLY WITH:
* SELF-CONTAINED AIR SUPPLY
* VENTILATION
* RESCUE HARNESS, MECHANICAL LIFT, STAND-BY PERSON

**DANGER/Peligro**
CONFINED SPACE
ESPACIO LIMATADO

**DANGER**
LIQUID MANURE STORAGE
PELÍGRO
ALMACENAJE DE ESTIÉRCOL LÍQUIDO