

Agriculture and Forestry Technical Work Group

Draft Policy Option: A1. Manure Digesters

1. Policy Description:

- a. Lay description of proposed policy action: Reduce CH₄ emissions from livestock manure through the use of manure digesters installed at dairies. Gas captured from the manure digesters is used to create heat or electricity, which offsets fossil fuel-based energy production and associated CO₂ and black carbon emissions.
- b. Policy Design Parameters:
 - i. Implementation level(s) beyond BAU: Existing manure digester operations in NM, including the number of head of dairy cattle.
 1. Total cows (2004-excluding calves) in New Mexico: **780,000 (455,000 beef, 325,000 dairy)** 2003 NMDA/ USDA NM Ag Statistics http://www.nass.usda.gov/nm/nmbulletin/30_03.pdf
 2. Total head of dairy cattle in New Mexico: 325,000, creating 925,275 thousand tons of dry manure/yr (DM estimates from DPNM Biomass Project 2005, Kyle Hoodenpyle).
 3. Emissions Estimate: 149 candidate farms for electricity production in NM, 63,000 tons total CH₄, 77,000 tons CH₄ production potential (Methane to Markets-Animal Waste Report-full citation pending).
 4. Existing manure digesters installed in New Mexico: **0**
 5. Pending/ Pilot Projects:
 - a. The Dairy Producers of NM with the Pecos Valley Biomass Coop have submitted permit application to the Chaves County Commission and received a \$250,000 grant from the State for a centralized digester for 25,000 head outside of Roswell, piping methane into PNM's main trunk line.
 - b. La Mesa Digester Pilot Project with NMSU to process 5,000 tons of manure/year (1,500 kWh/yr), implementing bi-phasic digester technology for dry climate/ open corral facilities.
http://www.nmsu.edu/~ucomm/Releases/2004/February/Samani_grant.html
<http://www.emnrd.state.nm.us/emnrd/ecmd/Press/documents/STACGrantAward.pdf>

- c. Microgy has submitted a permit application to the Chavez Co. Commission for a 12,000 head digester project.
<http://co.chaves.nm.us/agendas/2005/cc102005.pdf>
- d. An area on the outskirts of Roswell has been zoned to accommodate large digester operations.

By 2050, **75% of the dairy and feedlot population** shall be participating in either an on-site manure digester/generator facility or as part of a centralized digester/generator facility located in high density CAFO regions of the state, i.e. Mesquite, Portales, Roswell, Las Cruces, Clayton, Clovis, Hobbs/ Lovington, Artesia, Albuquerque/Belen/Socorro.

- ii. Timing of implementation: *Head of dairy and feedlot cattle affected from 2006-2020, including head of cattle affected in 2010 and 2020. Number in 2050, based on projected growth rate of 1.2% per year.*
 - 1. **2010 – 15% of total dairy cows (~52,000 out of 345,000)**
 - 2. **2020 – 35% of total dairy cows (~139,000 out of 398,000)**
 - 3. **2050 – 75% of total dairy cows (~417,000 out of 556,000)**
 - iii. Implementing parties: NM Environment Department (currently regulates NM dairy impacts on air and water—nitrate saturation), NM Energy Minerals and Natural Resources Department for incentives for biomass energy production, New Mexico State Engineer, NM Department of Agriculture (current regulatory role?).
 - iv. Other
- c. Implementation Mechanism(s): Indicate which mechanisms are to be used, and describe the specific approach that is proposed
- i. Information and education – YES, materials and talks throughout state from EMNRD/ NMDA/ NMED on opportunities for farmers
 - ii. Technical assistance – YES, technology/ implementation assistance from EMNRD (1 FTE)
 - iii. Funding mechanisms and or incentives – YES – (with market based mechanisms vi.), increase eligible equipment to receive tax compensating tax deduction, gross receipts tax deduction for biomass related equipment, agricultural grant program for clean energy development
 - iv. Voluntary and or negotiated agreements – YES, commitments from NM agricultural leaders, partnerships between dairies and utilities
 - v. Codes and standards – YES, air standards and permitting for GHG emissions (NMED)
 - vi. Market based mechanisms (above)

- vii. Pilots and demos – YES, memorial/ state funding for partnerships between universities and industry
- viii. Research and development – YES, necessary R&D for dry waste/ open corral feedlots, thermophilic plug flow digesters in southwest
- ix. Reporting – YES, as a NM industry generating GHGs
- x. Registry
- xi. Regulatory – YES, net-metering, interconnection standards, special buy-back rates for biomass kWh or biomass RECs

2. BAU Policies/Programs, if applicable:

- a. NM Clean Energy Grants Through NMEMNR, no monies appropriated in 2006, though seeking recurring revenue stream beginning 2007
- b. NM Biomass Equipment and Materials Compensating Tax Deduction: offsets state compensating (sales) tax on equipment and materials for landfill gas, biomass, municipal solid waste, CHP/Cogeneration, hydrogen, anaerobic digestion, ethanol, methanol, biodiesel, and microturbines.
- c. **Federal:** State Technologies Advancement Collaborative, Value-Added Grants Program, USDA Renewable Energy and Energy Efficiency Section 9006 Grants, USDA NRCS and EQIP Grants, CIG Awards.

3. Types(s) of GHG Benefit(s):

- a. CO₂: *Use of methane captured in manure digesters to generate electricity displaces fossil fuel use and associated CO₂.*
- b. CH₄: *Manure digesters collect and combust the CH₄ produced from anaerobic decomposition during manure storage.*
- c. N₂O
- d. HFC's, SFC's
- e. Black Carbon: *Use of methane captured in manure digesters to generate electricity displaces fossil fuel use and associated BC emissions.*

4. Types of Ancillary Benefits and or Costs, if applicable:

- a. Produces electricity and/or heat production for on-site use on farm or opportunity to sell energy, keeping energy dollars within that community if farm is locally owned,

- b. Reduces water quality problems and provides solution for managing nutrients (nitrate saturation occurs in many areas with high dairy density), VOC emissions,
 - c. Provides odor control, particularly for facilities near urban areas (Portales, Las Cruces, Roswell, Albuquerque Area),
 - d. Turns a waste product that is costly to dispose of into a value added product such as bedding, compost and energy,
 - e. Reduces of fossil fuel-based energy consumption, and
 - f. Reduces pathogen load, controls flies, reduces fine dust and reduces the spread of weed seeds.
5. Estimated GHG Savings and Costs Per MMTCO₂e:
- a. Summary Table of:
 - i. GHG reduction potential in 2012, 2020, 2050
 - ii. Net Cost per MMTCO₂e in 2012, 2020, 2050
 - b. Insert Excel Worksheet showing summary GHG reduction potential and net cost
6. Data Sources, Methods and Assumptions:
- a. Data Sources
 - b. Quantification Methods
 - c. Key Assumptions
7. Key Uncertainties if applicable:
- a. Benefits
 - b. Costs
8. Description of Ancillary Benefits and Costs, if applicable:
- a. Description of issue #1
 - b. Description issue #2
 - c. Etc.
9. Description of Feasibility Issues, if applicable:
- a. Description of issue #1

- b. Description of issue #2
- c. Etc.

10. Status of Group Approval:

- a. Pending
- b. Completed

11. Level of Group Support:

- a. Unanimous Consent
- b. Supermajority
- c. Majority
- d. Minority

12. Barriers to consensus, if applicable (less than unanimous consent):

- a. Description of barrier #1
- b. Description of barrier #2
- c. Etc.