Methane to Markets

Agriculture Subcommittee Report to Steering Committee

Jeremy Eppel

Department for Environment, Food and Rural Affairs- DEFRA (U.K.)

Jorge Hilbert

Instituto Nacional de Tecnologia Agropecuaria- INTA (Argentina)

28 January 2009

Monterrey, Mexico

Methane to Markets

Overview

- Sector Action Plan Summary
- Activities since the 2007 Beijing Meeting
  - Recent Subcommittee meeting
  - Selected Subcommittee Achievements
  - Example Activities by Country
- Next Steps

Methane to Markets

Background

- Sources of methane in the agriculture sector include:
  - ***Livestock manure management***
  - Livestock enteric fermentation
  - Rice cultivation
  - Agricultural waste burning
- The Agriculture Subcommittee has focused on methane from livestock manure management and utilization of anaerobic digesters.
  - Livestock manure management offers the most viable, short-term opportunities for methane recovery and utilization.
  - These opportunities can be realized using currently available technology and offer benefits in terms of improved environmental quality.
- The Agriculture Subcommittee last year included AD projects utilizing agri-food waste

Methane to Markets

Action Plan Overview

- The key obstacles to project development in this sector can be categorized into the following 6 key themes:
  - National capacity
  - Technology
  - Financial and Economic
  - Policy
  - Awareness
  - Project Identification and Development
- The Action Plan includes types of activities that can overcome these obstacles, as presented in the following table.

Methane to Markets

Sector Action Plan Overview (continued)

Obstacle to Project Development	Examples of Current Action Plan Items to Address Obstacles
National capacity	▪Promote capacity building in governments ▪Provide AD experts in the Ag Country Profiles
Technology	▪Support technology demonstrations ▪Bring together technology developers in the Project Network
Financial and Economic	▪Each country to identify and support investment opportunities ▪Include possible financiers in the Project Network
Policy	▪Share lessons learned from policy development ▪Analyze differences in policy portions of Country Profiles
Awareness	▪Keep up-to-date information on the M2M Web site ▪Hold international seminars on ag methane recovery and use
Project Identification and Development	▪Track on-going projects in the M2M project database ▪Present projects at the Expo

Subcommittee Achievements since November 2007

- **Subcommittee Meeting and Workshop on Overcoming the Barriers for the Implementation of Anaerobic Digestion in the Agricultural Sector – 22 to 24 April 2008, Morelia, Mexico**
  - 25 attendees at the Subcommittee Meeting
  - Approximately 80 participants in the Workshop
  - Countries represented: Argentina, Australia, Canada, India, Mexico, Thailand, United Kingdom, United States
  - Subcommittee meeting participants provided input on the next steps for the Subcommittee
  - Workshop attendees shared anaerobic digestion information and participated in a site visit to a swine farm

Methane to Markets

Subcommittee Activities since November 2007 (continued)

- Country representatives have developed country strategic plans which include information on:
  - International cooperation
  - Country strategy for promoting AD
  - Government Structures
  - Country Contacts
  - Conclusions an observations
  - References and Source
- ASG developed a paper to summarize the methane emission mitigation options associated with enteric fermentation and rice cultivation
- The U.S. EPA developed a draft international protocol for determining the performance of anaerobic digestion systems
  - The Subcommittee has recommended experts for review of the document
- The U.S. EPA investigated data available on anaerobic digestion of various types of food wastes
  - This information will assist project development for AD systems utilizing food processing wastes
- The U.S. EPA summarized available information on leakage from anaerobic digestion systems

Methane to Markets

Example Activities by Country

- **Argentina**
  - AD projects are being conducted at the Instituto Nacional de Tecnología Agropecuaria (INTA) Research Center.
  - INTA has also created a new bioenergy program, under which AD will be supported as a bioenergy source.
  - INTA is conducting GIS studies and has initiated three postgraduate studies to research AD.
  - More than 10 AD projects have been created in Argentina over the past year.
  - U.S. EPA is collaborating with INTA to develop a country assessment. A field mission has been accomplished and final report delivered. Future work will include pre-feasibility studies and demonstration project.
  - Several meetings and a national white paper have been developed in order to create M2M Argentina. Several secretaries of state universities research institutions and private firms are included.

- **Australia**
  - The Australian Government has pledged to use 20 percent renewable energy by the year 2020 and is in the process of establishing a mandatory GHG trading scheme.
  - The Australian government and industry research organizations have invested approximately $2 million towards the research and development of methane capture and use technology in the Australian intensive livestock industries.

- **Canada**
  - Canada currently has 10 farms operating AD systems in several provinces.
  - Several provinces have adopted policies to increase the use of renewable energy and decrease GHG emissions.
  - Canadian scientists have been conducting research on field measurements of

Methane to Markets

Example Activities by Country (continued)

- **China**
  - The Chinese Ministry of Agriculture is partnering with EPA on a number of initiatives to expand improved village- scale digesters and technical training in rural areas.
  - A market assessment of methane recovery and use opportunities in the livestock and agro-industrial waste sector was completeing and shows that the most potential for projects and methane reduction is in the southeastern region particularly in medium to large farms in Hunan.
  - The World Bank has provided funding to develop affordable pollution control methods for livestock waste management. This now includes a demonstration projects in Guangzhou ($7M) and Shanghai ($5M)
  - Small farm initiative going in China in Northern China and Szechuan

- **Colombia**
  - Country resource assessment under way
  - U.S. EPA providing funding for a pre-feasibility study for a slaughterhouse facility and processing plant.

- **India**
  - Currently, 4 million household AD systems utilize the biogas produced from cattle manure.
  - There are also approximately 2,000 larger scale biogas systems in operation at large farms. Some of these plants use commingled waste streams including manure and food waste or slaughterhouse waste.
  - Indian authorities are working with the United States to expand the Indian AgSTAR program from the dairy sector to distillery and winery sectors.

Methane to Markets

Example Activities by Country (continued)

- **Mexico**
  - There are currently 449 AD systems in Mexico that include 89 AD projects registered under the Kyoto Protocol's Clean Development Mechanism (CDM).
    - The projects account for GHG emission reductions of 2,566 tons of carbon dioxide (CO_2).
  - SEMARNAT has corroborated with the U.S. to develop a series of commercial-scale demonstration farms at various swine farms to raise awareness and technical capability within Mexico.
  - USEPA is assisting SEMARNAT to implement the next phase to advance the capability of the Mexican anaerobic digester industry.

- **Philippines**
  - US EPA is collaborating to develop a country assessment

- **Thailand**
  - The swine sector has the greatest potential for AD development because cattle farms are small and generally pasture based.
  - At large and medium scale swine farms, there is the potential to produce 2.2 million tons of CO_2 equivalents of methane each year in Thailand.
  - Currently 600,000 tons of CO_2 equivalents of methane are captured from swine waste; the goal is to capture 2 million tons by the year 2012.
  - In 2008, Thailand began working with M2M to reduce methane from swine farms in three provinces located near Bangkok.

Methane to Markets

Example Activities by Country

- **United Kingdom**
  - The U.K. Government is developing with stakeholders a shared Vision Statement and Implementation Plan for AD.
  - The Energy Act 2008 provides financial incentives for renewable energy through ROCs (Renewable Obligation Certificates). AD is amongst the technologies receiving the highest level of support at 2 ROCs/MWh.
  - The U.K. Waste Resources and Action Program (WRAP) is developing a standard for AD digestate. The aim is to have a certification scheme in place by May 2009.
  - There is also financial support available for AD projects and research through new U.K. grant programmes, including:
    - Bio-energy Capital Grants Scheme,
    - Rural Development Programme for England, and
    - WRAP's Organics Capital Grant Programme.
  - The U.K. government has funded a 10 million pound demonstration programme to show the different benefits of the 'state of the art' use of AD.

- **United States**
  - The AgSTAR Program develops awareness of AD systems in the U.S. and provides technical support to system developers and operators. EPA has been supporting the domestic biogas use programs through its AgSTAR program for the past 15 years.
  - There are approximately 120 AD systems operating in the United States, mostly at dairy operations. These AD systems produce 215 million kilowatt hour equivalent of electricity per year. Another 20 AD projects are planned.

Methane to Markets

Example Activities by Country

- **United States (continued)**
  - The U.S. Farm Bill is the largest project financing system for AD systems, with $2 million available for AD systems.
  - Research is also being conducted by the U.S. Department of Agriculture (USDA) into nutrient removal from waste streams through digestion, co-digestion of various waste streams, and energy use from AD systems.
  - EPA is currently developing a GHG reporting system. This system will require U.S. entities with large GHG emissions to report their emissions to EPA.
  - Internationally, EPA has provided grant money for projects related to M2M and issued a grant solicitation in December 2007. Multiple grants were awarded in the agriculture sector, totaling $1.2 million.

- **Vietnam**
  - The World Bank has provided funding to develop affordable pollution control methods for livestock waste management, while EPA has provided technical assistance necessary to implement these projects.
  - Through the deployment of anaerobic digestion technologies, the program mitigates water pollution from confined swine production and promotes institutional capacity building and policy development and implementation. In addition, the program includes support for pollution reduction quantification.

Methane to Markets

Next Steps

- **Next Subcommittee Meeting**
  - **Fall 2009**
  - **Location to be determined**
- **Next Steps**
  - **Review of international protocol for evaluating the performance of anaerobic digestion systems by selected international experts.**
  - **Preparations for 2010 M2M Expo**
  - **Response to other steering committee charges**
  - **Country assessments studies on Thailand, Philippines, Vietnam, and Argentina are being finished and demonstration plants will be implemented.**
  - **Begin new studies on Colombia, Brazil, Ecuador**