ACCELERATING DAIRY SECTOR ENERGY SAVINGS AND PRODUCTION

Washington, DC  July 19, 2011
Improving Dairy Sector Sustainability
Bruce I Knight, Strategic Conservation Solutions, LLC

Sustainability

- No longer a philosophical movement – now a consumer response
- Pressure coming internationally in the marketplace
- Nearly every commodity check-off is making an investment in sustainability (life cycle analysis)
- Wine and Dairy appear to be the furthest along (perhaps due to proximity to their consumers)
Sustainability Definition

- UN in the mid 1980’s - “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”
- 1995 Farm Bill – A formal definition - too long for any slide.
- Today – It's still in the eye of the beholder.

Dairy Sustainability

- Driven by consumer demand
- 10 Projects that improve sustainability while decreasing costs
- Farm Energy Audit Program
- Dairy Power
- All projects must maintain or improve profitability
Dairy is energy intensive

- Fuel for crop production
- Electricity – livestock heating and cooling
- Natural gas and propane for irrigation and drying
- Fertilizer
- Transportation of products and impact on prices
- Cooling of product throughout the value chain

Controlling energy costs

- Advances in energy and production technology
- Renewable and alternatives
- Conservation/Energy audits
  - Farm
  - Processing
  - Handling
  - Transport
Farm Energy Audit Program –
Achieving 2011 Goals -- 600 Audits

- 3-Prong Strategy “Awareness – Education – Action”

1. Create awareness and demand for audits among producers
2. Provide easy access to a one-stop-shop, centralized and comprehensive energy resource
3. Launch a pilot campaign in 3 states:
   a) Creates grassroots support with key influencers
   b) Builds a scalable approach for generating sustained demand for audits and energy improvements for the coming years

Audits are a keystone in Sustainability
Dairy Power

- Goal: 1300 digesters nationwide by 2020
- “Digester a week” in 2011
- Building finance models
- Building partnerships
- Streamlining Programs
- Dependent upon USDA program support

Dairy/USDA – Progress

- Dairy Power Team identified key barriers REAP funding barriers:
  - ROI interpretation
  - Personal loan guarantees
  - Collateral requirements
  - Digester not treated as a system
  - Application scoring for REAP
- Interim Rules – Dairy Power Team Comments
  - Value-Added Producers Grant
  - Biorefinery Assistance Guaranteed Loan Program (9003)
  - REAP
- 21 Dairy digester applications received $12.5 Million in REAP awards out of $90 million in total awards
- “Stack” projects with multiple USDA programs (REAP, B&I, EQIP)
"Project Finance" Business Model

Feedstock Agreement
- Contract for Term of Debt Service
  - Manure Co-Substrates
  - Supply Contract for Term of Debt Service with Credit Worthy Supplier

Technology Agreement
- Digestor Performance Guarantee
  - Finance Options
    - USDA
    - Banks
    - Bonds
    - Grants
    - Mutual Funds
    - Private Equity
    - Other

Off-take Agreement
- Contract for Term of Debt Service
  - Electricity
  - Bio-Gas Sales
  - Fiber
  - Fertilizer
  - Carbon Credits
  - Compost
  - Waste Heat
  - Other

A Business Model for Sustainable Dairy Digester Systems

- Crop fertilizer
  - $300,000 annual avoided cost
  - $100,000 annual avoided cost

- Manure

- Aerobic Digestor System
  - 750 Nm³/day system

- Manure compost
  - 20,000 cubic yards of digester slurry
  - $160,000 annual revenue

- 3,000 Lactating Dairy Cows

- Clean Renewable Energy
  - $8 million with 5% power
  - $100,000 annual revenue

- Sustainable Energy
  - Current R&D
  - $150,000 annual revenue

- Carbon Credits
  - $100,000 annual revenue

- Recycle waste
  - Create clean renewable energy
  - Advance sustainable products

- Milk
  - Annual production of 40 million pounds
  - 7 million gallons of milk

Nutrient-Rich Dairy Products

For more information, see www.CaliforniaSustainability.com or contact InnovationCenter@Calpoly.edu

U.S. Dairy Sustainability Commitment

INNOVATION CENTER COMPOST