

# Welcome to the Web Conference

---

## U.S. Dairy Industry's Report *National Market Value of Anaerobic Digester Products*

April 11, 2013

Sponsored by  
Innovation Center for U.S. Dairy in association with  
Informa Economics, American Biogas Council and  
Washington State University



# Today's Agenda

---



- **Introductions**
- **Market Potential Overview**
- **Sustainable Food System**
- **Eco System benefits**
- **Case Examples**
- **National Biogas Industry**

# Innovation Center for U.S. Dairy

- 34 CEOs or Chairmen of companies representing 80% of Milk
- 17 Farmer owned Companies + 6 Farmer Board Members
- 200 dairy companies and 800+ professionals
- 61,000+ hours of participation in 2011



# National research team

---

## Informa Economics

- Leader in agricultural commodities
- Defined revenue potentials for digester products



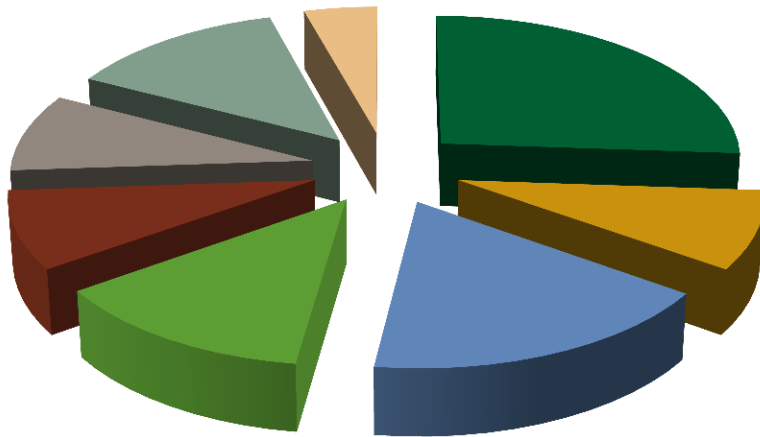
## Center for Advanced Energy Studies

- Idaho Universities and DoE Idaho National Laboratory
- MOU with IC for joint dairy industry research
- Technical support for the report and economic models



# National advisory committee

## Committee Membership



- Digester Developers
- Co-Products
- NGO
- Governmental
- Producers
- Research
- Financial
- Communications

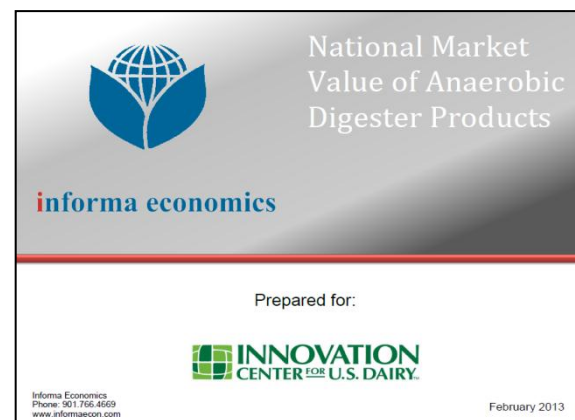


# Overview

---

*Report frames opportunities for dairies, food processors and retailers to create nearly a \$3 billion bioeconomy for food and agriculture while addressing current environmental concerns:*

- *Food waste repurposing*
- *Nutrient harvesting*
- *Environmental quality*

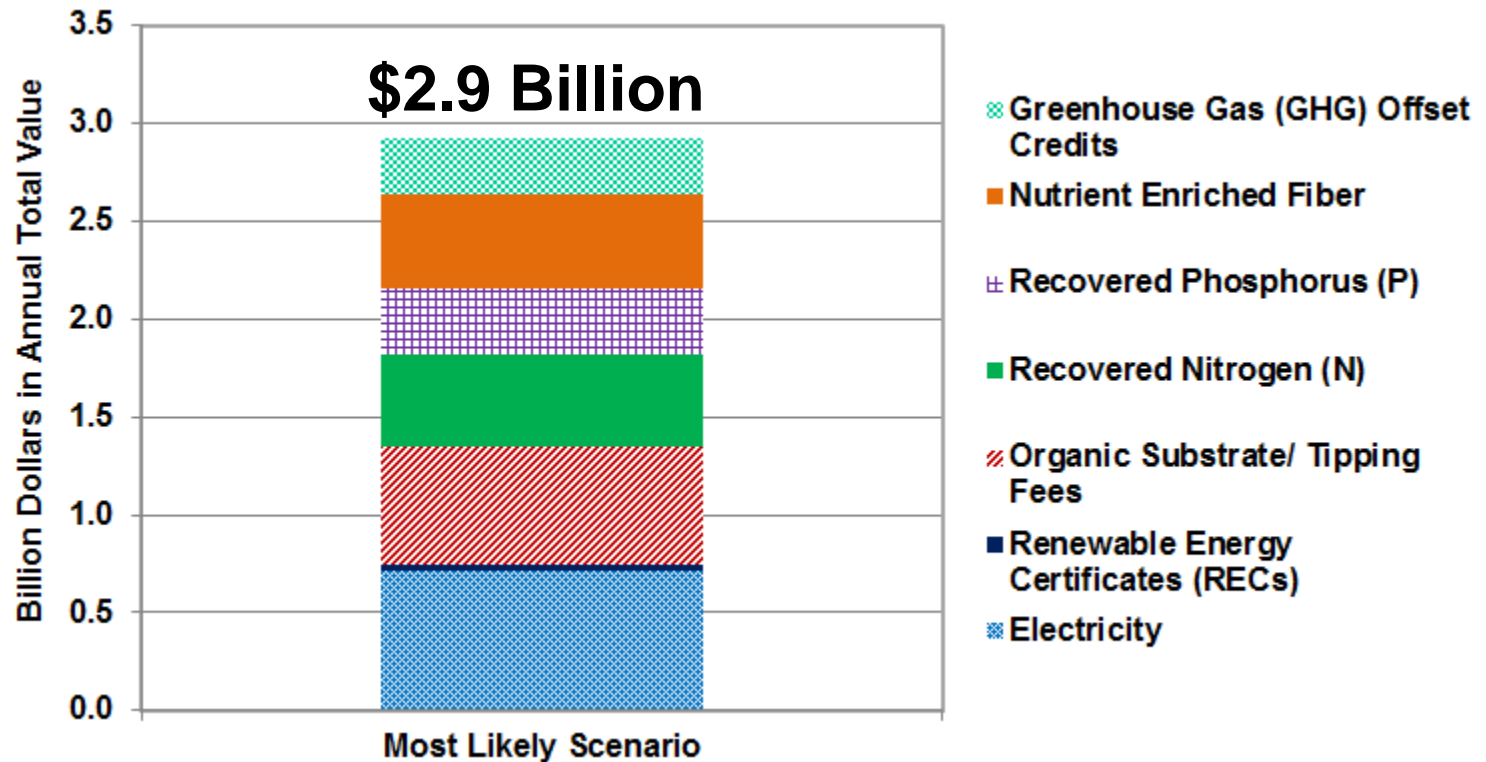


[www.USDairy.com](http://www.USDairy.com)

**Google: National Market Value of Anaerobic Digester Products**

---

# Digester products market potential

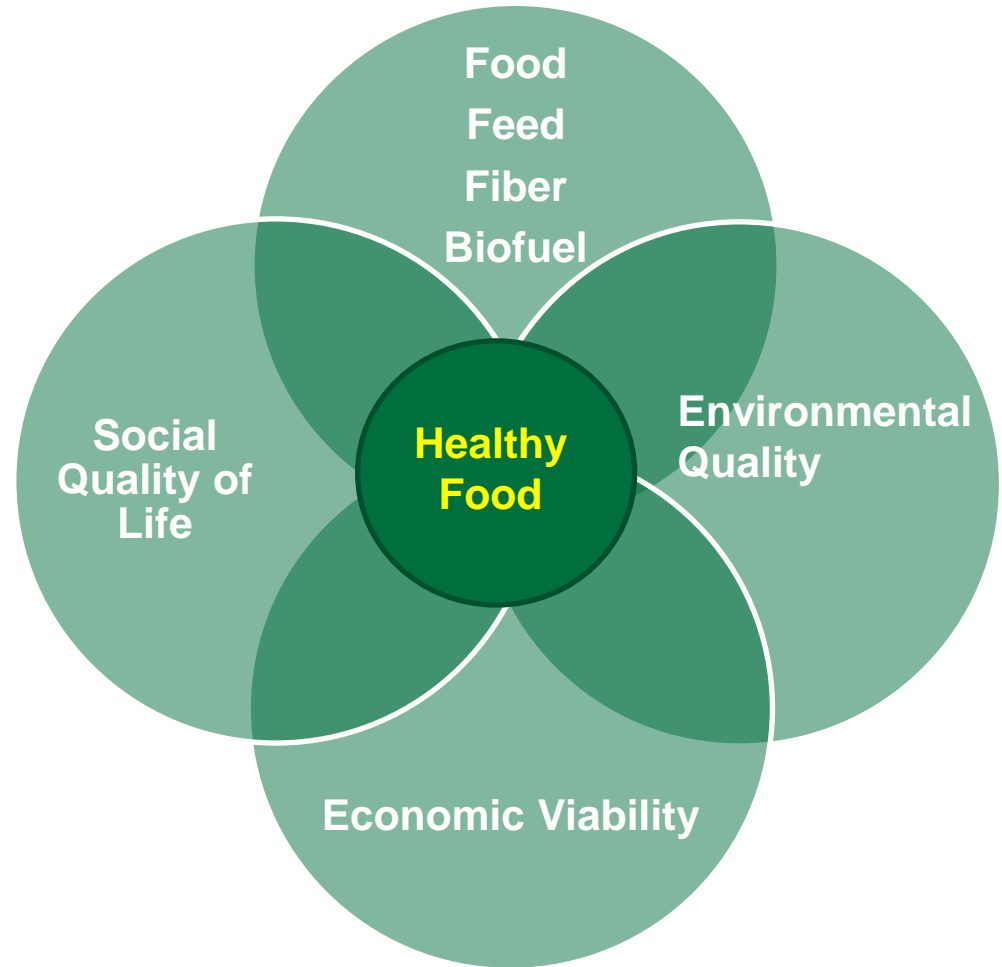


Dairy industry can generate value by repurposing food waste from landfills, converting into renewable energy and providing for ecosystem services; resulting in a business model that enables a 21st century bioeconomy for food and agriculture

# The need for a sustainable food system

---

- Satisfy human food, feed and fiber needs, and contribute to biofuel needs
- Enhance quality of life for farmers, farm workers and society as a whole
- Sustain economic viability of agriculture
- Enhance environmental quality and the **resource base (nutrients such as nitrogen and phosphorus)**

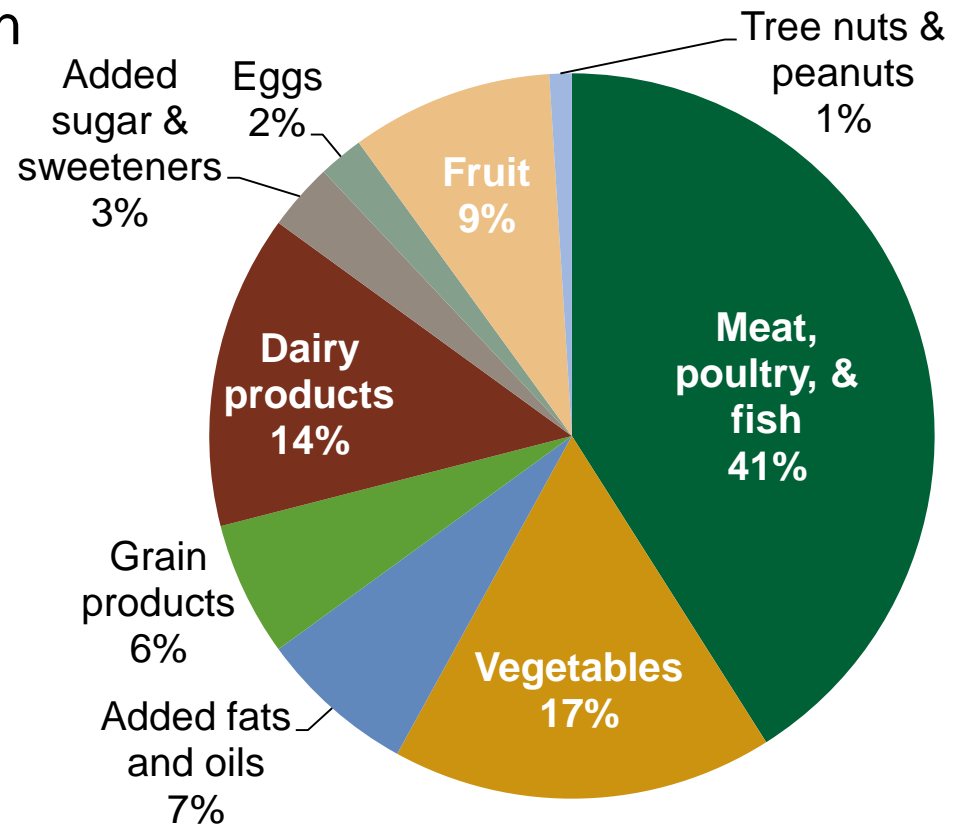




# One out of three food calories is wasted

- 29% of America's food supply was lost from human consumption
- Estimated total value at retail and consumer levels was \$165.6 billion
- 273 pounds of food per person
- Disposal costs add one billion dollars in local taxes annually

## Food waste by retail value (\$165.6B total)



# What if 2 tons/wk of food waste were repurposed?

---



**2 tons/week**



**Nutrients (N & P)**

- 17 tons Nitrogen
- 1.3 tons Phosphorus

(Annual Values)

# What if 2 tons/wk food waste added to manure digester?



**2 tons/week**

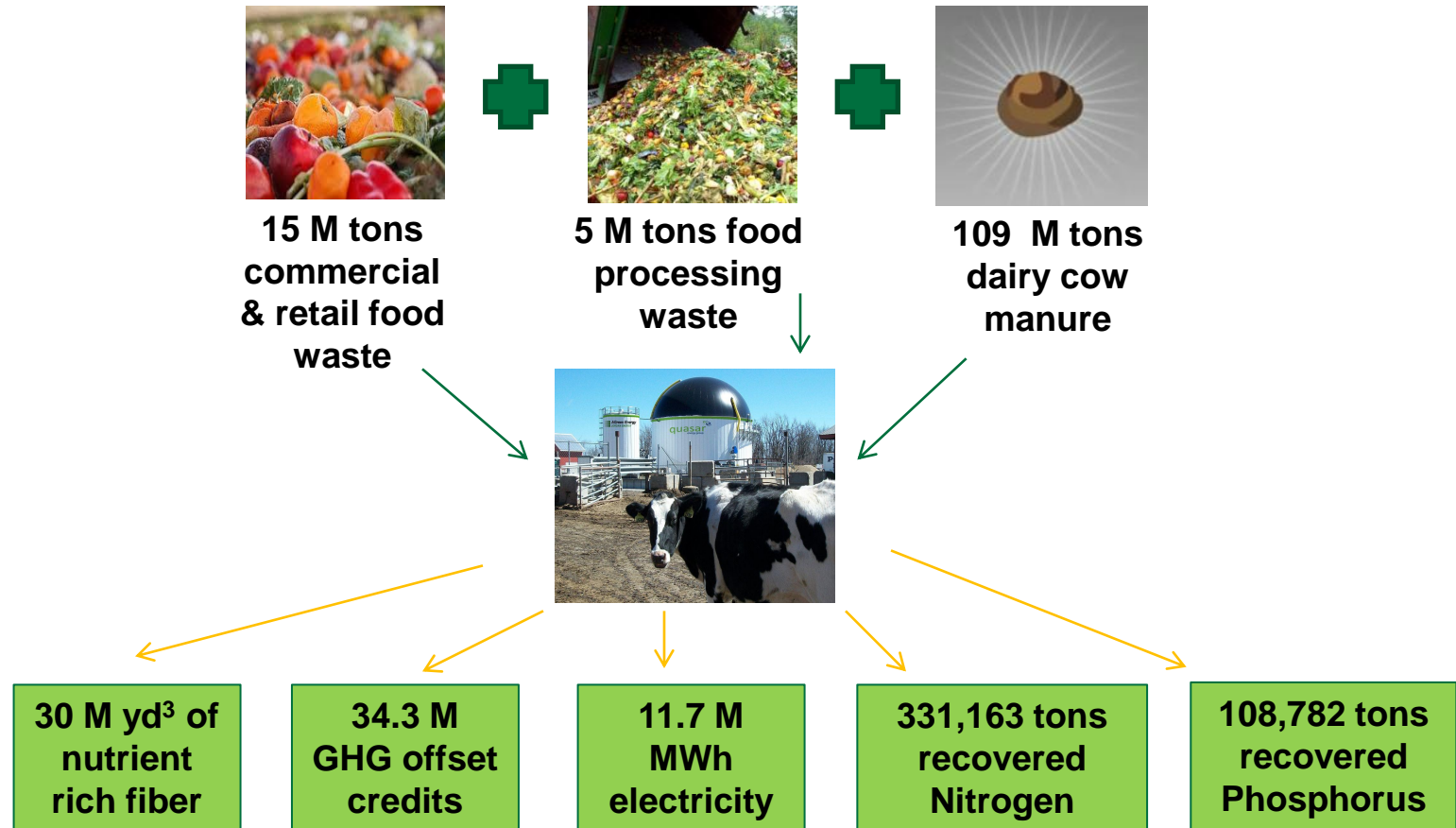


**Dairy digester  
(1,000 cows)**

- 226 tons Nitrogen
- 28 tons Phosphorus
- Green Power for 300 homes

(Annual Values)

# What if 70% of commercial food waste currently being thrown away was put back into the food system?



# Eco System benefits from repurposing food waste



15 M tons  
commercial  
& retail food  
waste



5 M tons food  
processing  
waste



109 M tons  
dairy cow  
manure



1.5 billion cubic  
foot bags of  
nutrient rich  
potting fiber

3.2 million  
cars off the  
road

Electricity  
for 1 million  
homes

331,163 tons  
avoided  
nitrogen  
fertilizer  
production

108,782 tons  
avoided  
phosphorus  
fertilizer  
production

# Transformational partnerships – dairies and retailers

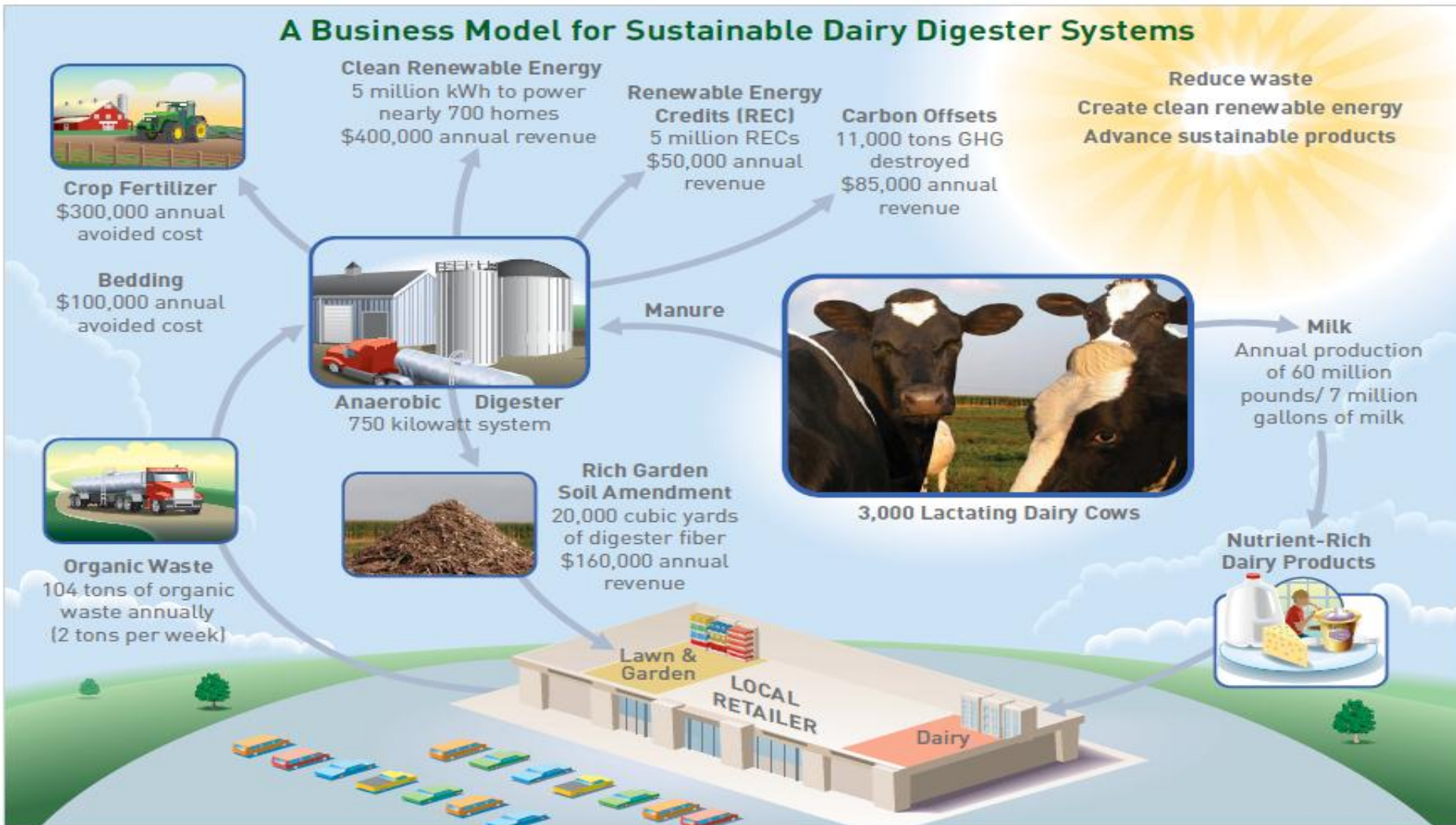
---

Retailers and farmers together are realizing the market opportunities and environmental benefits of repurposing manure and food waste to their highest values



# Case example - Big Sky West Dairy, ID (www.US Dairy.com)

## A Business Model for Sustainable Dairy Digester Systems





Manure collection

Manure slurry plus food  
waste supplied to the  
digester



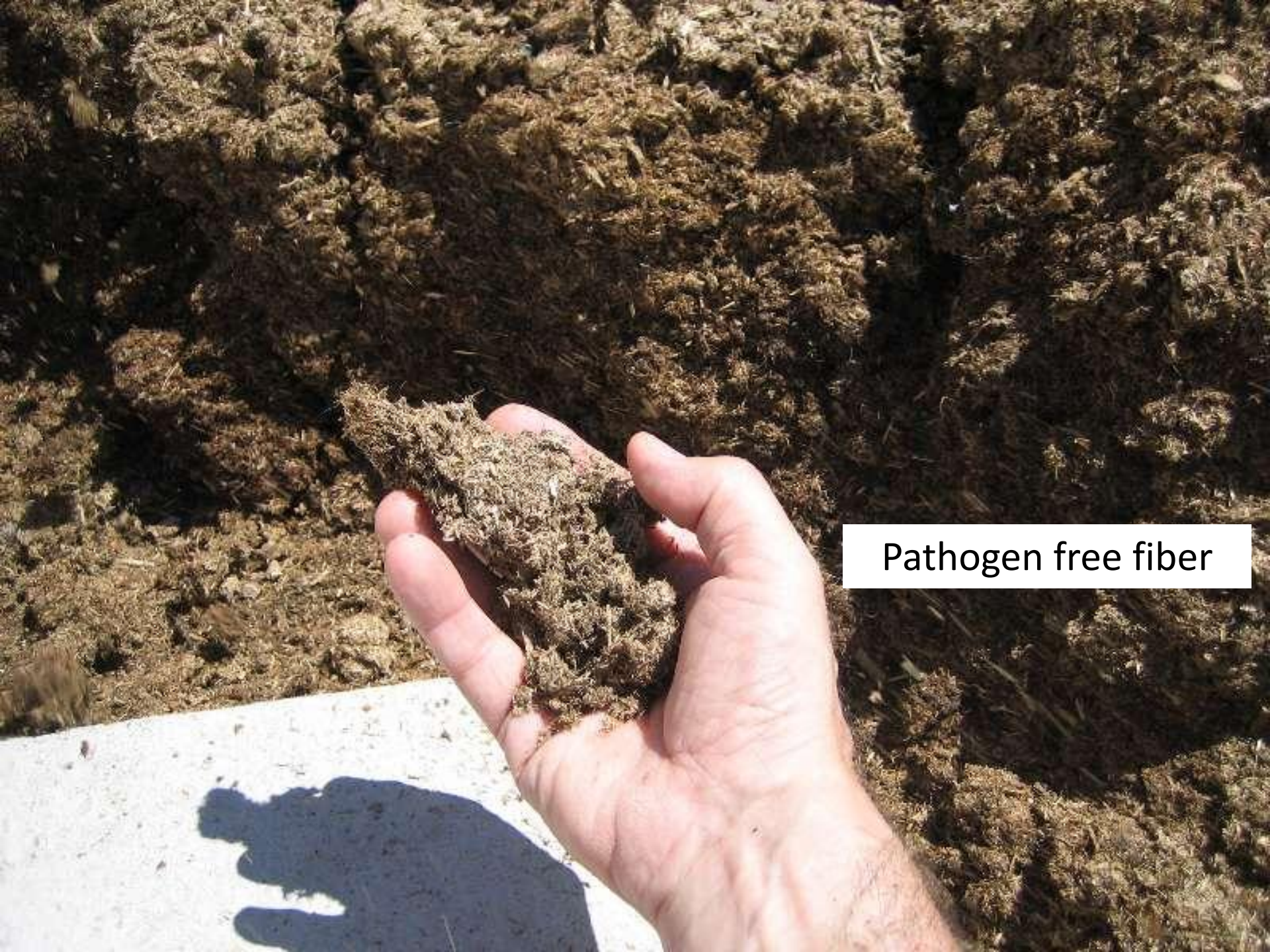




Electricity produced with CO2e credits and  
Renewable Energy Credits



Fiber extracted after digester



Pathogen free fiber



Fiber available for sale as high quality peat moss alternative



N & P can be separated from digester effluent (or from a lagoon with no digester)

# Nutrient fractionation

---

**Joe Somers**

Informa Economics

- Lagoon Only
- Lagoon with Digester
- Lagoon with Digester and Separation Technologies

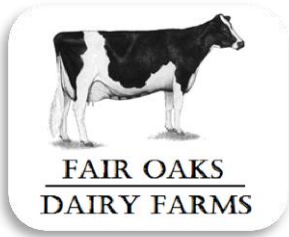
**Craig Frear, PhD**

Washington State University

- Separation Technologies



# Case Study - Fair Oaks Farm, IN ([www.USDairy.com](http://www.USDairy.com))



Digester



Biogas Cleaning



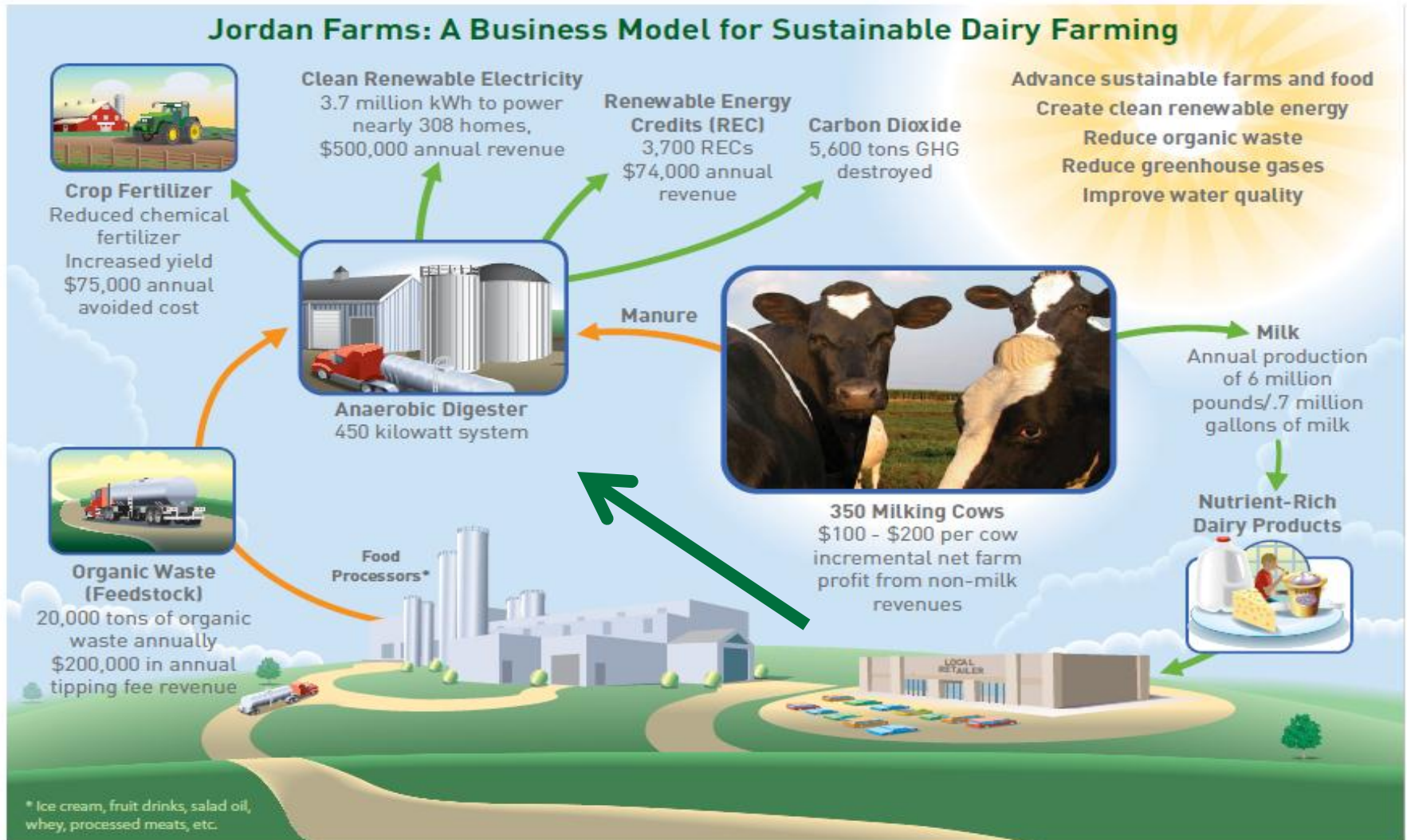
Fair Oaks  
Fuel Station



**Compressed Natural Gas  
(Bio-Methane)**

CNG fuel for 42  
long-haul milk  
trucks

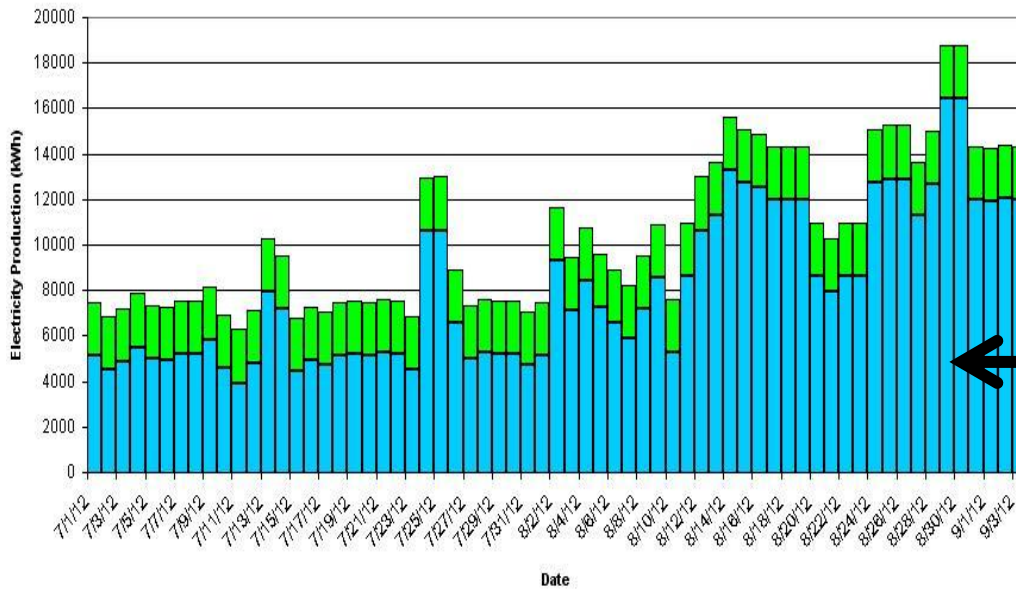
# Case Study - Jordan Dairy Farm, MA ([www.USDairy.com](http://www.USDairy.com))





# Electricity production using food waste and manure

Jordan Dairy Biogas Daily Electricity Production



70% of the electricity from food waste

# Thank You

---

## **Jerry Bingold**

Innovation Center for U.S. Dairy

[Jerry.bingold@rosedmi.com](mailto:Jerry.bingold@rosedmi.com)

[www.USDairy.com](http://www.USDairy.com)

## **Joseph Somers**

Director of Washington Consulting

Informa Economics

Tel: 703-891-6307

[joe.somers@informaecon.com](mailto:joe.somers@informaecon.com)

[www.informaecon.com](http://www.informaecon.com)

## **Craig Frear, PhD**

Assistant Professor

Center for Sustaining Agriculture and Natural Resources

Department of Biological Systems Engineering

Washington State University

[cfrear@wsu.edu](mailto:cfrear@wsu.edu)

# American Biogas Council

---

## Perspectives on Developing a National Biogas Industry

**Patrick Serfass**

Executive Director

American Biogas Council

Tel: (202) 475-0868

[pserfass@ttcorp.com](mailto:pserfass@ttcorp.com)

[www.americanbiogascouncil.org](http://www.americanbiogascouncil.org)



# 170 Companies and the Entire Biogas Supply Chain



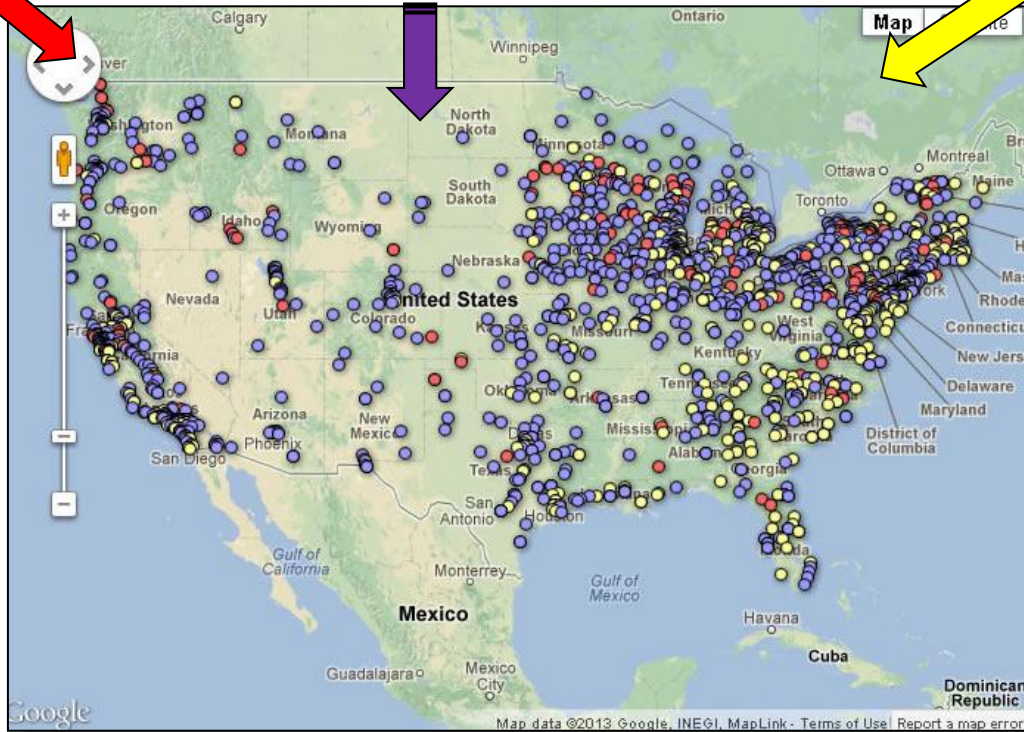
# U.S. Biogas Market – Current and Potential

192  
on Farm  
(Dairy AND Swine)

1,238  
Wastewater

594  
at Landfills

**2,000+**  
Operational  
Biogas  
Systems



**12,000+**  
Potential  
Biogas  
Systems

8,200  
on Farm  
(Dairy AND Swine)

4,200  
Wastewater

540  
at Landfills

# A Legislative and Regulatory Push

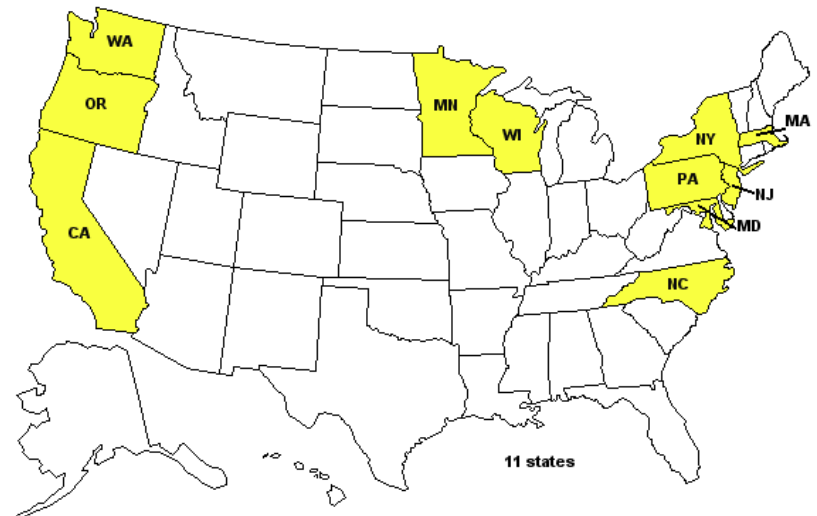
## ■ Federal Activities

- Farm Bill (elec.)
- Biogas ITC (gas)
- Tax Extenders (elec.)
- Renewable Fuel Standard (gas)
- Clean Energy Standard (elec.)
- USDA, EPA, DOE, DOD

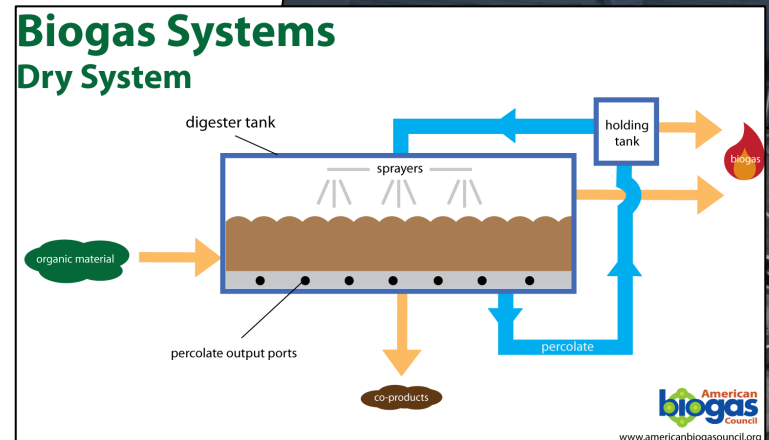
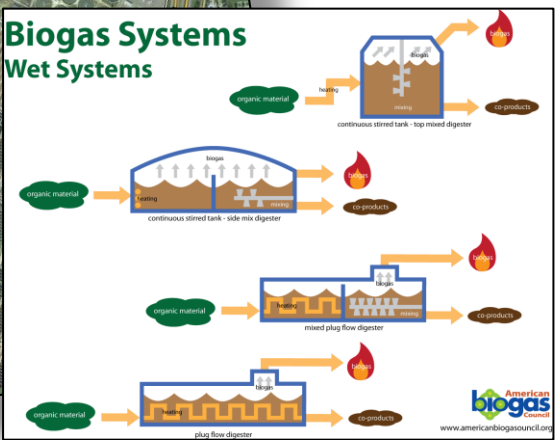
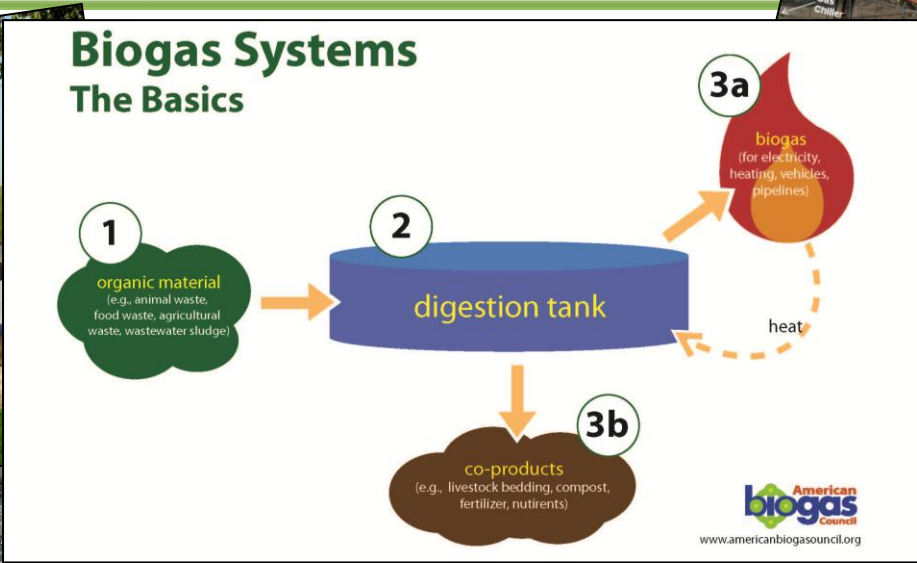
## ■ State Activities

- Organic Waste Plans: Top 11 States
- CA, WA, OR, WI, MN, NY, MA, PA, NJ, MD, NC

Organic Waste Plans-Top 11 States



# Increasing Education



---

# Thank you

Patrick Serfass  
American Biogas Council  
202.640.6595  
info@americanbiogascouncil.org

[www.AmericanBiogasCouncil.org](http://www.AmericanBiogasCouncil.org)