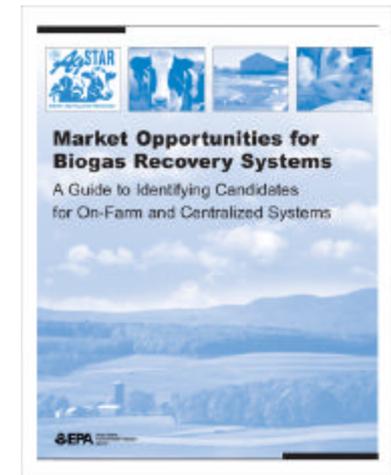
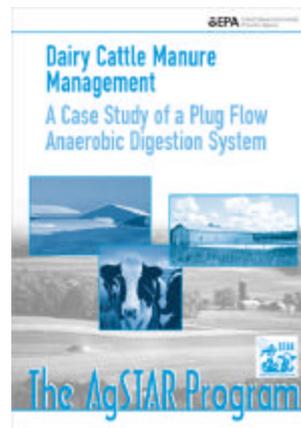
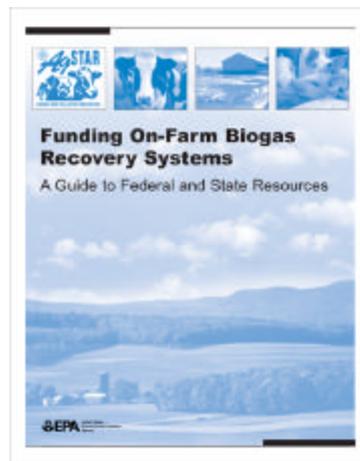
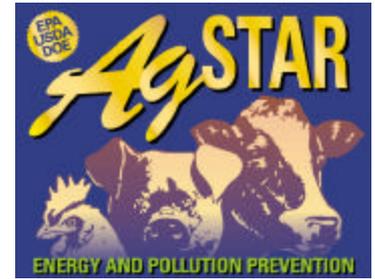




AgSTAR Resources

Kurt Roos
AgSTAR Program
U.S. Environmental Protection Agency





Introduction

AgSTAR Program Components

- Farm Bill and USDA Collaboration
- State program collaboration
- Informational Products
 - General
 - Technical
 - Supported by Measurement and Evaluation program
 - Compares economic and environmental performance of various waste management options
 - Project Development Tools
- Outreach and Extension
 - Conferences, workshops, field days, and tradeshow events
 - Website - WWW.EPA.GOV/AGSTAR
 - Toll free hotline 1-800-952-4782 (from 9-5pm EST)

General Informational Products

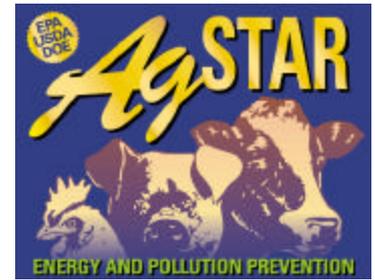


- AgSTAR Digest - Annual report
 - Highlights the year in Animal Waste Digestion
 - Technologies, funding, national project listings
 - Next edition Fall 2004



- Managing Manure with Biogas Recovery Systems
 - Introductory brochure on digester technology, costs, and environmental performance





Technical Products

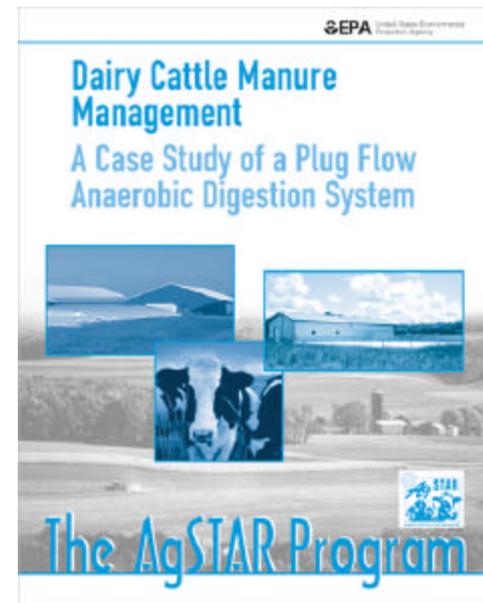
- Mass Balance Waste Management Evaluations (under way)
 - Economic and environmental process comparisons for pigs and dairy
 - Processes include storage, separation, heated digesters, unheated digesters, combined treatment storage lagoons, partial aeration, deep pits





Technical Products

- Technical Series (*under development)
 - *Dairy Case Study Scrape Manure
 - *Pig Case Study Flush Manure
 - *Other Digester system reports
 - In 2005 Dairy Case Study Flush Manure

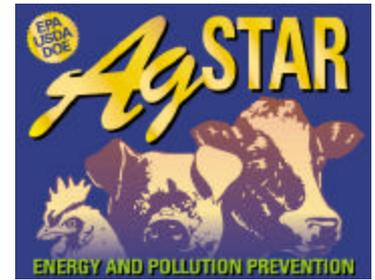


Project Development Tools



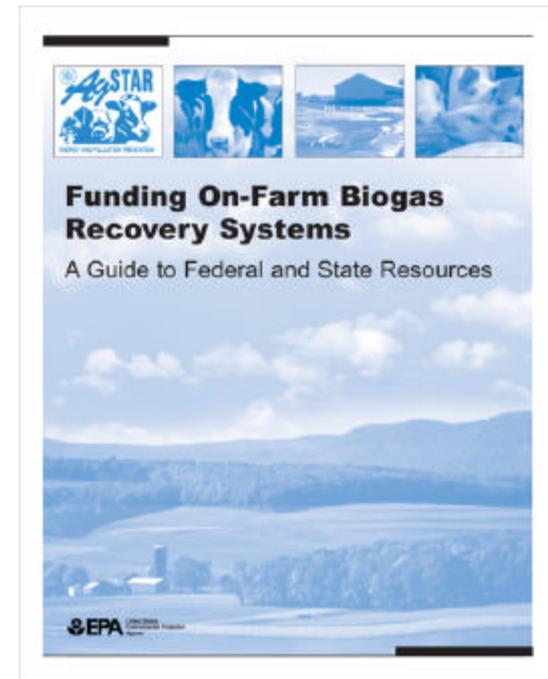
- Second Edition AgSTAR Handbook - *A Manual for Developing Biogas Systems at Commercial Farms in the United States.*
- FarmWare - develops project specific feasibility assessments
 - technology type, energy, environmental, and cost/benefit.
- Industry Directory
 - Lists and provides description of designers, equipment suppliers, and consultant services.

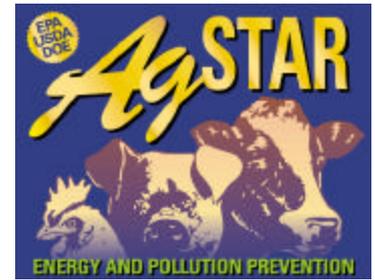




Project Development Tools

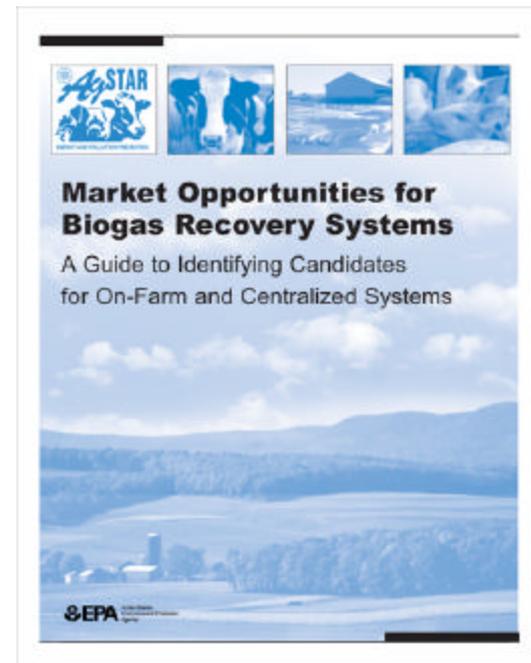
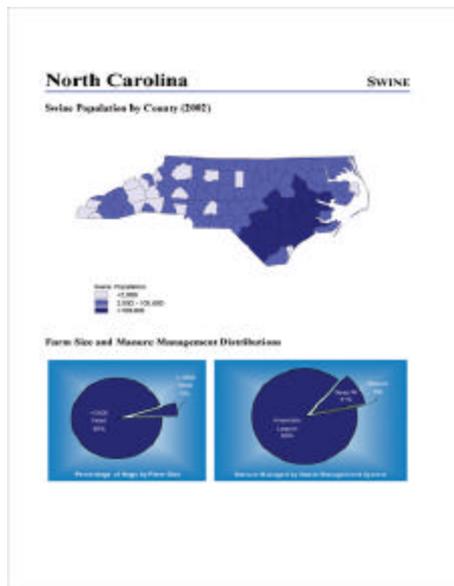
- Funding Guide for Federal and State Resources
 - Summarizes federal and state animal waste digestion funding assistance
 - Grants, loans, energy production incentives
 - For each program type provides:
 - Program description
 - Eligibility requirements
 - Contacts

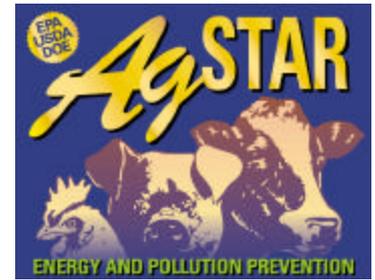




Project Development Tools

- Market Opportunities for Biogas Recovery Systems
 - Provides state-by-state profiles of numbers of farm candidates, renewable energy potential, and methane emission reductions.
 - Provides a summary of the national energy and digestion market potential





National Market Synopsis

National Market Opportunity

Candidate Dairy Farms	2,500
Candidate Swine Farms	4,000
Average Cost Farm	\$500,000
Potential Market	\$3,250,000,000

Notes:

Analysis is ongoing and numbers are preliminary

Market may be overestimated due to:

Swine includes all deep pit operations

Animal population data is for 2002.

At this time analysis does not include energy prices across states

National Energy Opportunity

	Million kWh/year	MW
Swine	2,634	301
Dairy	2,245	256
Total	4,879	557



Top States and Opportunities

Table 2. Top States for Electricity Production from Anaerobic Digestion of Swine Manure (2002)

State	Number of Candidate Farms	Total State Emissions (1000 Tons)	Emissions from Candidate Systems (1000 Tons)	Methane Production Potential (1000 Tons)	Electricity Production Potential (million kWh/year)
NORTH CAROLINA	1,271	258	242	243	765
IOWA	999	228	87	153	481
OKLAHOMA	74	58	53	62	195
MINNESOTA	416	72	30	57	178
MISSOURI	279	71	47	50	159
ILLINOIS	299	67	26	42	133
INDIANA	218	51	20	34	106
NEBRASKA	160	44	16	28	87
KANSAS	95	36	23	28	87
TEXAS	21	24	17	19	61
Remaining 40 States	476	188	99	136	429
Total US	4,308	1,097	660	852	2,681

Notes:

Analysis is ongoing and numbers are preliminary

Market may be overestimated due to:

Swine includes all deep pit operations

Animal population data is for 2002.

At this time analysis does not include energy prices across states

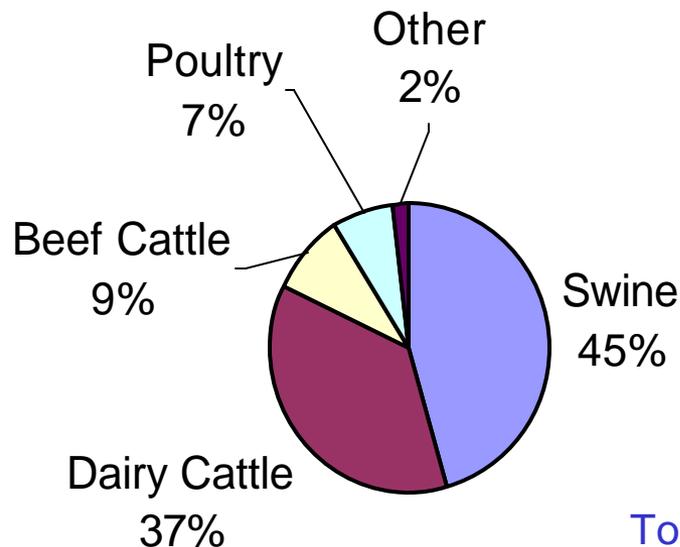
Table 3. Top States for Electricity Production from Anaerobic Digestion of Dairy Manure (2002)

State	Number of Candidate Farms	Total State Methane Emissions (1000 Tons)	Emissions from Candidate Systems (1000 Tons)	Methane Production Potential (1000 Tons)	Electricity Production Potential (million kWh/year)
CALIFORNIA	986	301	250	361	1,137
NEW MEXICO	134	63	62	76	238
IDAHO	161	69	42	61	192
FLORIDA	90	21	19	37	115
ARIZONA	85	36	34	35	111
TEXAS	143	50	21	35	110
WASHINGTON	125	33	15	31	97
NEW YORK	129	21	2	20	62
COLORADO	45	13	7	14	43
OREGON	40	12	3	7	23
Remaining 40 States St	586	186	12	37	117
Total US	2,524	805	467	714	2,245

National Methane Reduction Potential



Manure Management Methane by Animal Type



	Million kWh/year	MT Methane
Swine	2,634	660,000
Dairy	2,245	466,500
Total	4,879	1,126,500

Energy production does not equal methane reduction

Total Year 2000 CH₄ Emissions = 1.8 Tg