



Expanding Biogas and Digestate Use at Water Resource Recovery Plants

Patrick Serfass - American Biogas Council

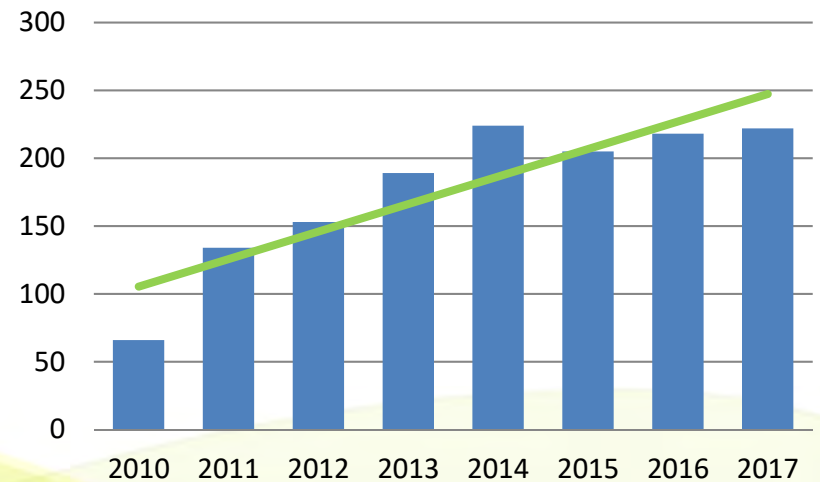
Wastecon | ISWA World Congress
27 September 2017 | Baltimore, MD USA



American Biogas Council: The Voice of the US Biogas Industry

- The **only** U.S. organization representing the biogas and anaerobic digestion industry
- **Over 200+ Organizations** from the U.S., Germany, Italy, Canada, Sweden, Belgium and the UK
- **All Industry Sectors Represented:**
 - project developers/owners
 - anaerobic digestion designers
 - equipment dealers
 - waste managers
 - waste water companies
 - farms
 - utilities
 - consultants and EPCs
 - financiers, accountants, lawyers and engineers
 - Non-profits, universities and government agencies

ABC Membership



○ **Join Us!** www.AmericanBiogasCouncil.org



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American Biogas Council

americanbiogascouncil.org



U.S. Biogas Market – Current and Potential

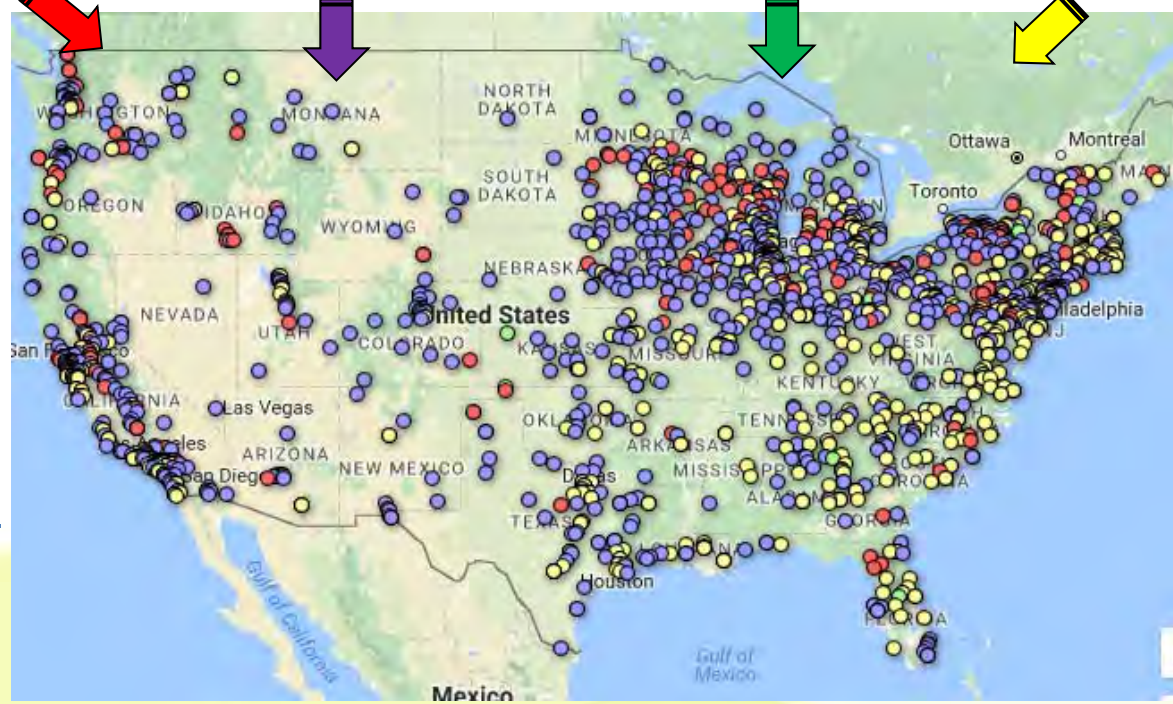
247
on Farm
(dairy, swine only)

1,269
Water
(860 using their biogas)

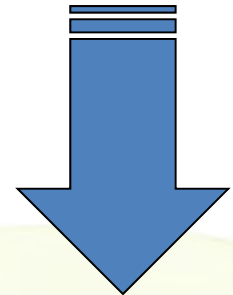
39
Food Scrap

645
at Landfills


2,200+
Operational
Biogas
Systems



13,500+
Potential
New Biogas
Systems



8,241
on Farm
(dairy, swine only)

3,888
Water
(incl. 380 not using their biogas)

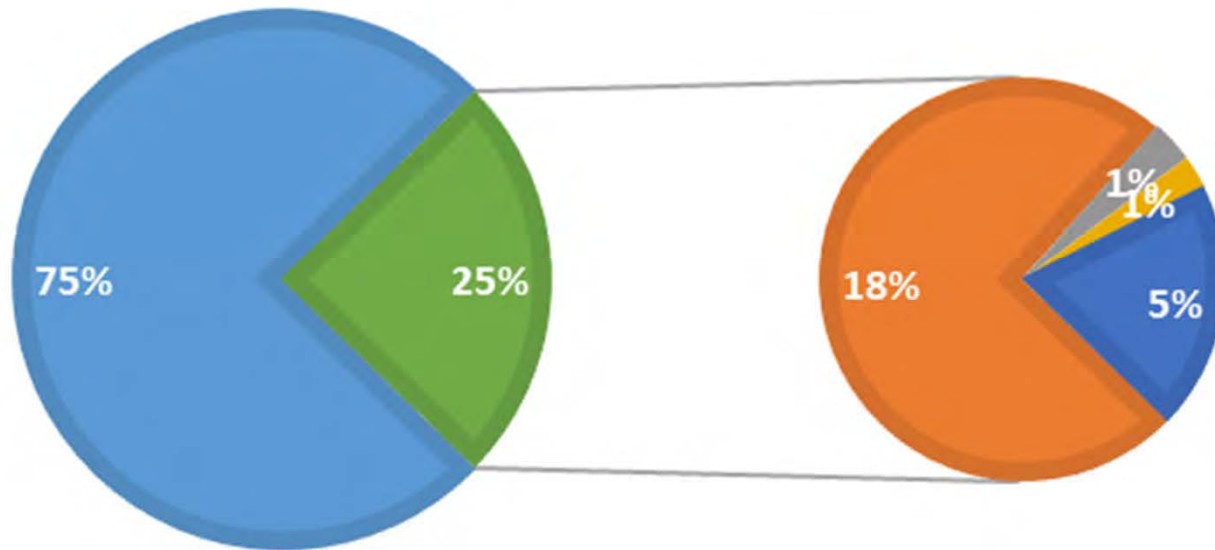
931
Food Scrap

440
at Landfills

Market Opportunity & Digester Types

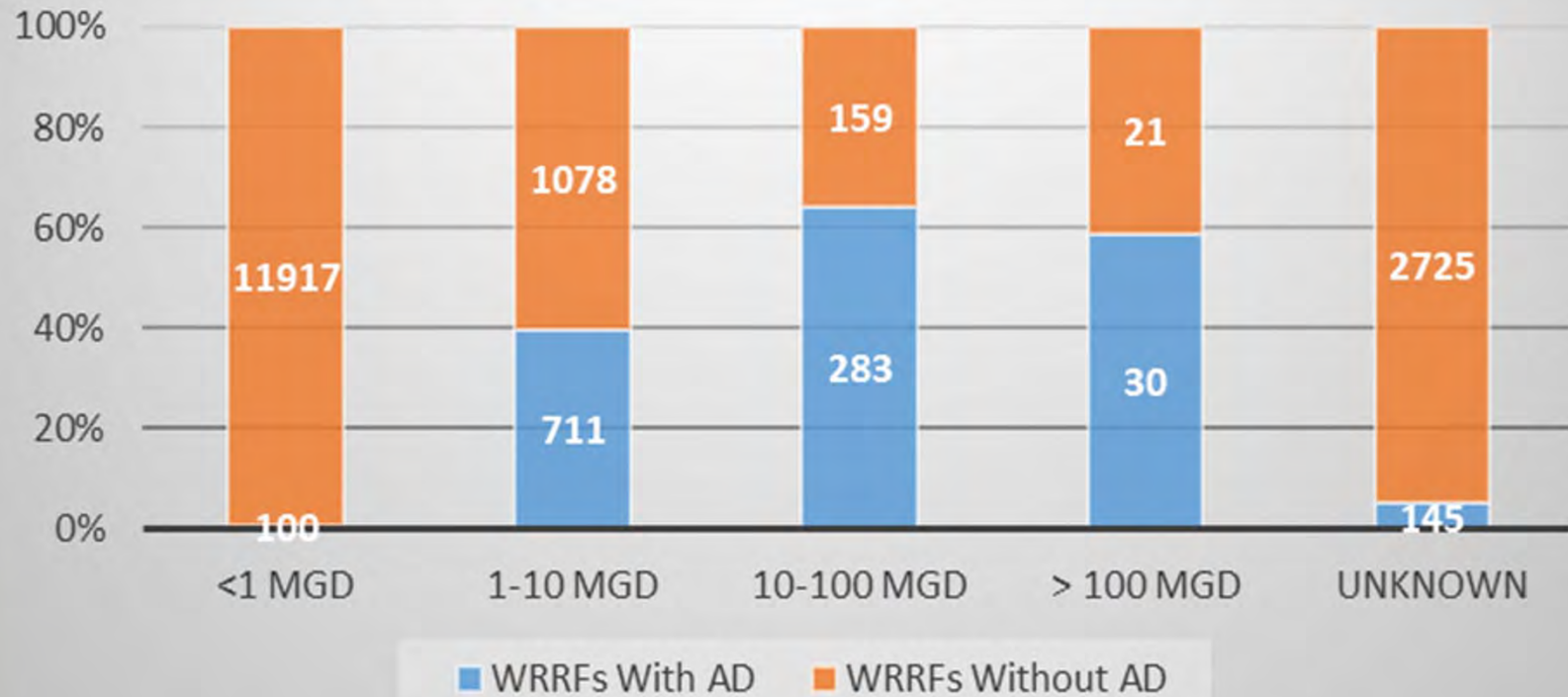
WRRFS \geq 1MGD WITH BIOGAS SYSTEMS AND TYPES - NATIONAL

- NO Biogas System
- Biogas-Mesophilic
- Biogas-Thermophilic
- Biogas-Both
- Biogas-Unknown Type

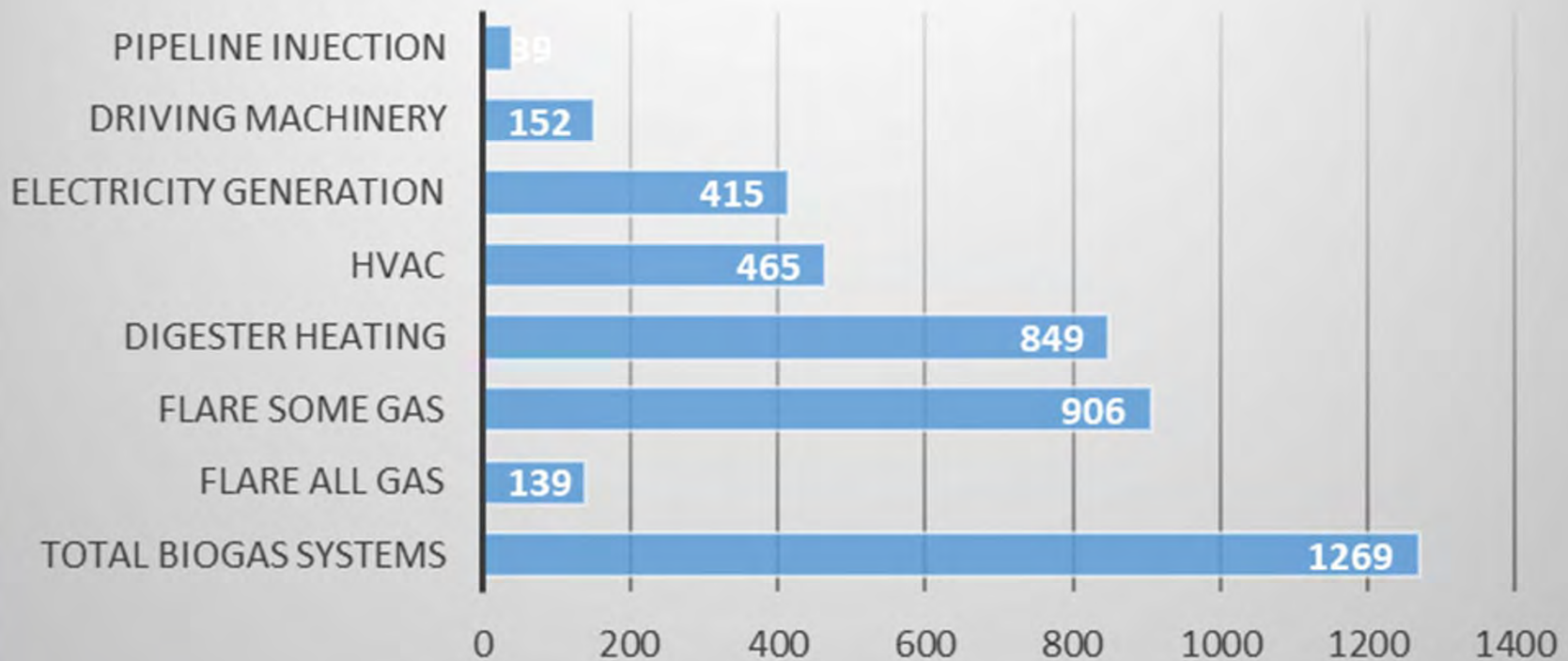


Biogas System Penetration

Biogas System Development Potential by Size of WRRF



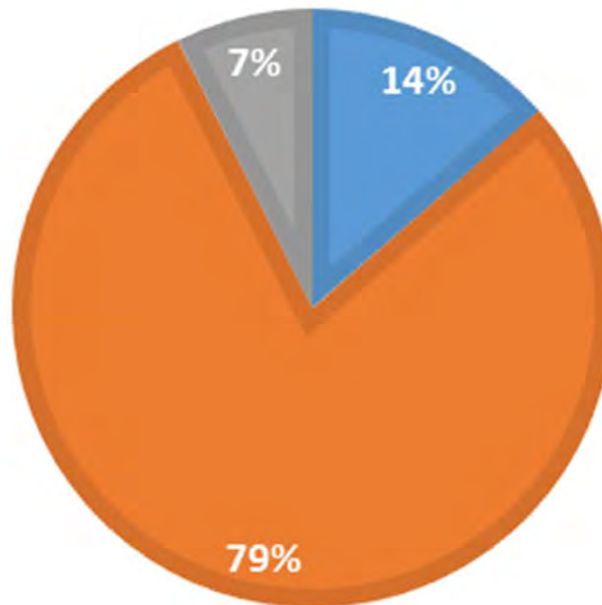
Biogas Utilization at WRRFs with Anaerobic Digesters



Additional Substrates?

WRRFS THAT ACCEPT ADDITIONAL ORGANIC MATERIAL

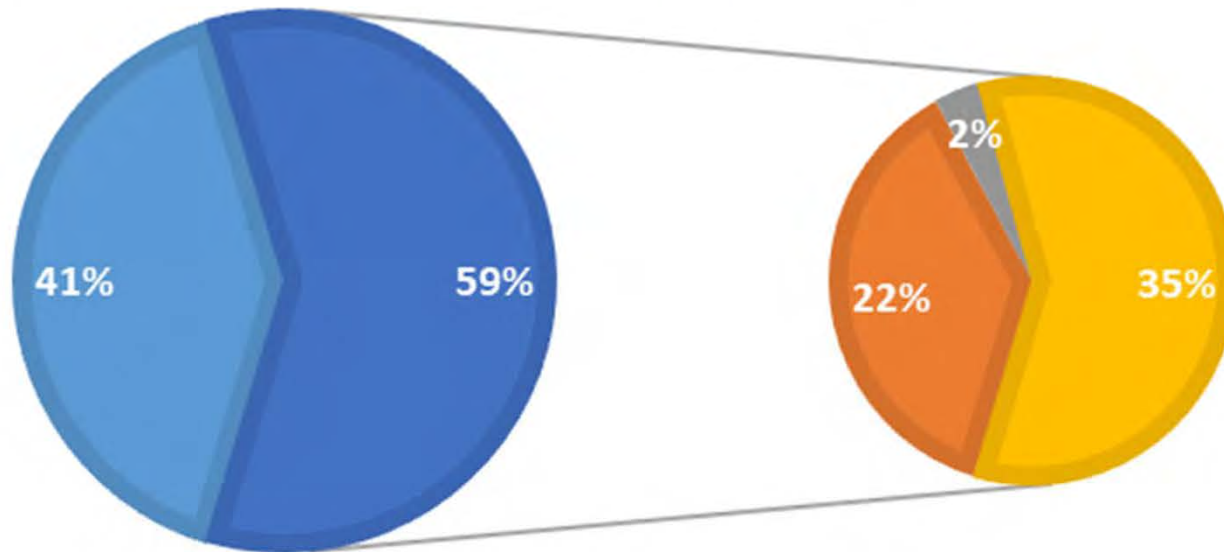
■ Additional Organics Added ■ No Organics Added ■ Unknown



Biosolids/Digestate Use

BENEFICIAL USE OF BIOSOLIDS - NATIONAL

- Biosolids Not Beneficially Reused
- Distributed to Consumers
- Sold to Consumers
- Unknown Use



WRRF Opportunities

- Use ALL of the biogas
 - 70% flare some biogas
- Add food waste
 - Add 10% food waste, get 2-5x more biogas
- Upgrade biogas to RNG
 - RNG = \$3/MMBTU; RIN credits = \$40/MMBTU
- Sell the digestate
 - Certify it at www.Digestate.org

Digestate



Digestate Challenge

- Too often, digestate is a cost, even when given away for free
- What if it could generate just a little bit of revenue/ton?

Annual Digestate Production (Tons/year)	\$ 1.00	\$ 3.00	\$ 5.00	\$ 10.00	\$ 20.00
5,000	\$ 5,000	\$ 15,000	\$ 25,000	\$ 50,000	\$ 100,000
50,000	\$ 50,000	\$ 150,000	\$ 250,000	\$ 500,000	\$ 1,000,000
100,000	\$ 100,000	\$ 300,000	\$ 500,000	\$ 1,000,000	\$ 2,000,000
250,000	\$ 250,000	\$ 750,000	\$ 1,250,000	\$ 2,500,000	\$ 5,000,000
500,000	\$ 500,000	\$ 1,500,000	\$ 2,500,000	\$ 5,000,000	\$ 10,000,000
1,000,000	\$ 1,000,000	\$ 3,000,000	\$ 5,000,000	\$ 10,000,000	\$ 20,000,000

Reference projects:

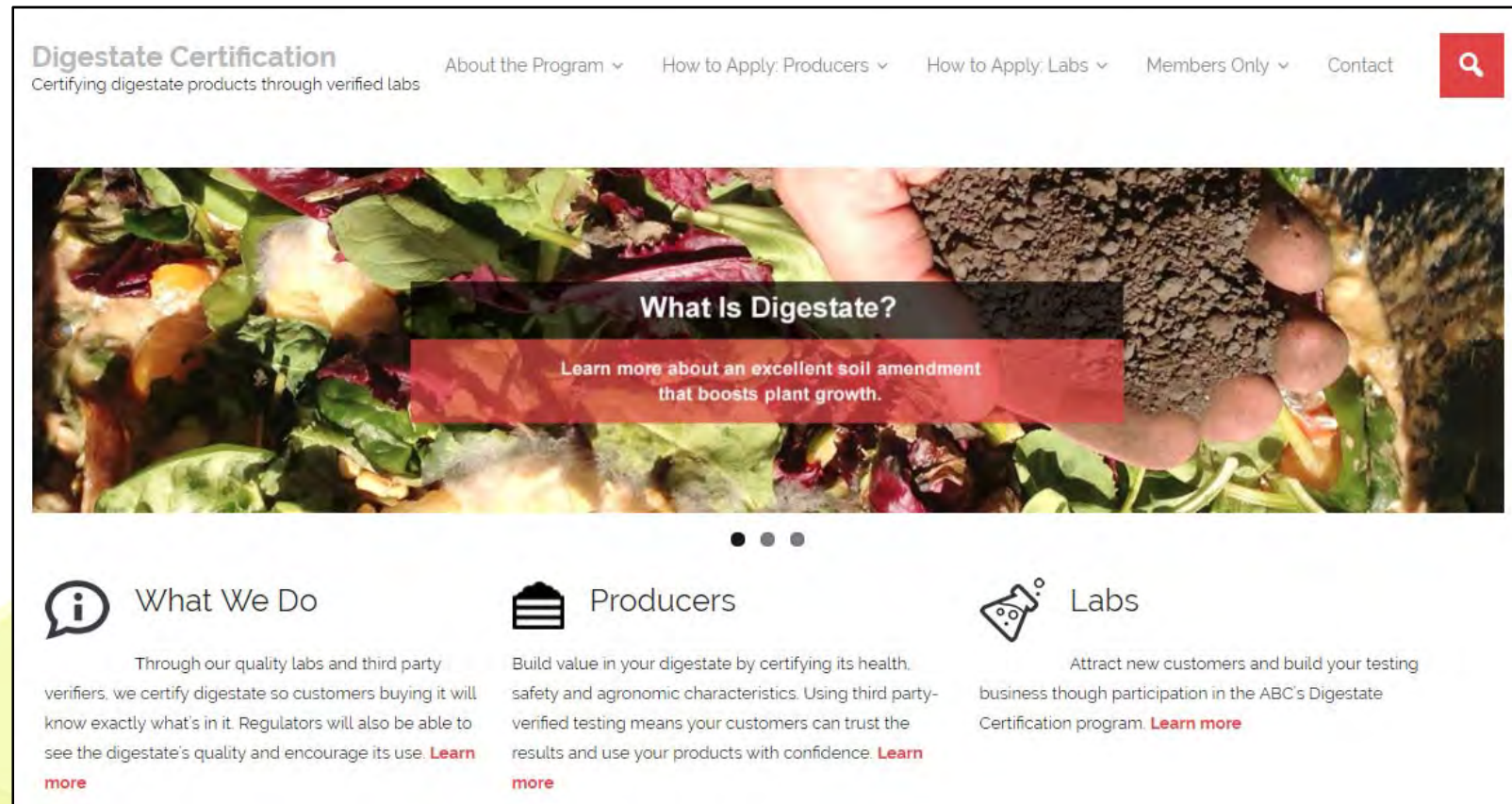
- College campus food and yard waste = 10,000 tpy
- 1,000 cows = 50,000 tpy | 15,000 cows = 800,000 tpy

How do we get digestate customers to pay?


Convince them the product is safe to use, comes from a good source (a digester), and has the nutrients the producers says it does.


New US Digestate Standard

www.Digestate.org






Digestate Certification
Certifying digestate products through verified labs

About the Program ▾ How to Apply: Producers ▾ How to Apply: Labs ▾ Members Only ▾ Contact 



What Is Digestate?
Learn more about an excellent soil amendment that boosts plant growth.

• • •

-  **What We Do**
Through our quality labs and third party verifiers, we certify digestate so customers buying it will know exactly what's in it. Regulators will also be able to see the digestate's quality and encourage its use. [Learn more](#)
-  **Producers**
Build value in your digestate by certifying its health, safety and agronomic characteristics. Using third party-verified testing means your customers can trust the results and use your products with confidence. [Learn more](#)
-  **Labs**
Attract new customers and build your testing business through participation in the ABC's Digestate Certification program. [Learn more](#)

Testing Packages

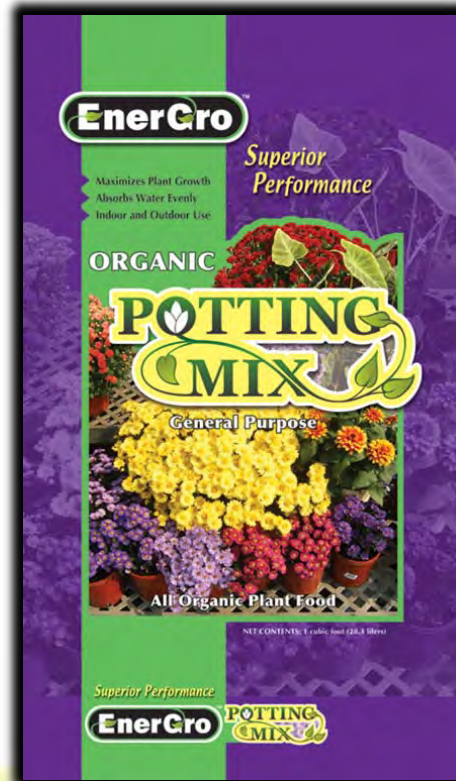
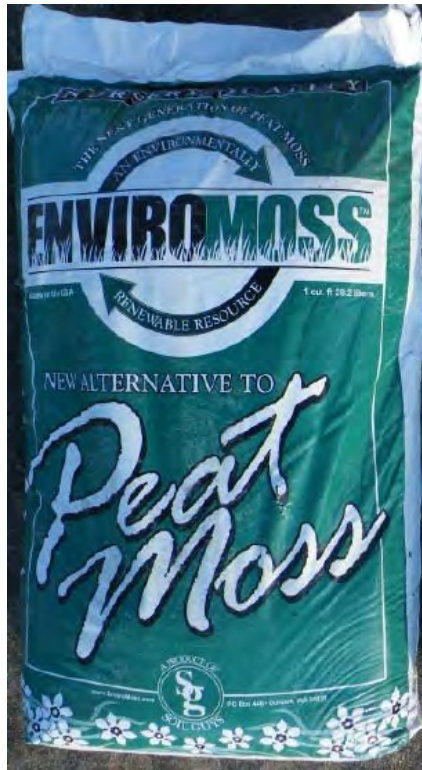
Table 1: Required testing for Digestate End Use Classifications

These tests provide the minimum information required to determine appropriate use. Digestate users may require additional testing parameters prior to acceptance.

Possible Digestate End Use	Generally Unrestricted Bulk Sales or Land Application	Restricted Land Application
→ Fecal Coliform or Salmonella	X	X
Total N, P, K	X	X
Organic Ammonia and Nitrate Forms	X	X
Secondary and Micro-Nutrient Assay	X	
pH	X	
Total Solids and Moisture Content	X	X
Volatile Solids	X	
→ Metals	X	X
Physical contamination	X	X
Soluble Salts	X	
Stability (VFA or CO ₂ Respiration)	X	X

- For Digestate Producers:
 - Increased revenue
 - Increased marketability
- For Digestate Buyers:
 - Product meets high health and safety requirements
 - Can trust nutrient label

Digestate Products





Thank You!

- **Learn More**
 - Sign up for the **FREE Biogas News**
 - www.AmericanBiogasCouncil.org
- **Become a Member**
 - Application online, or contact us

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