

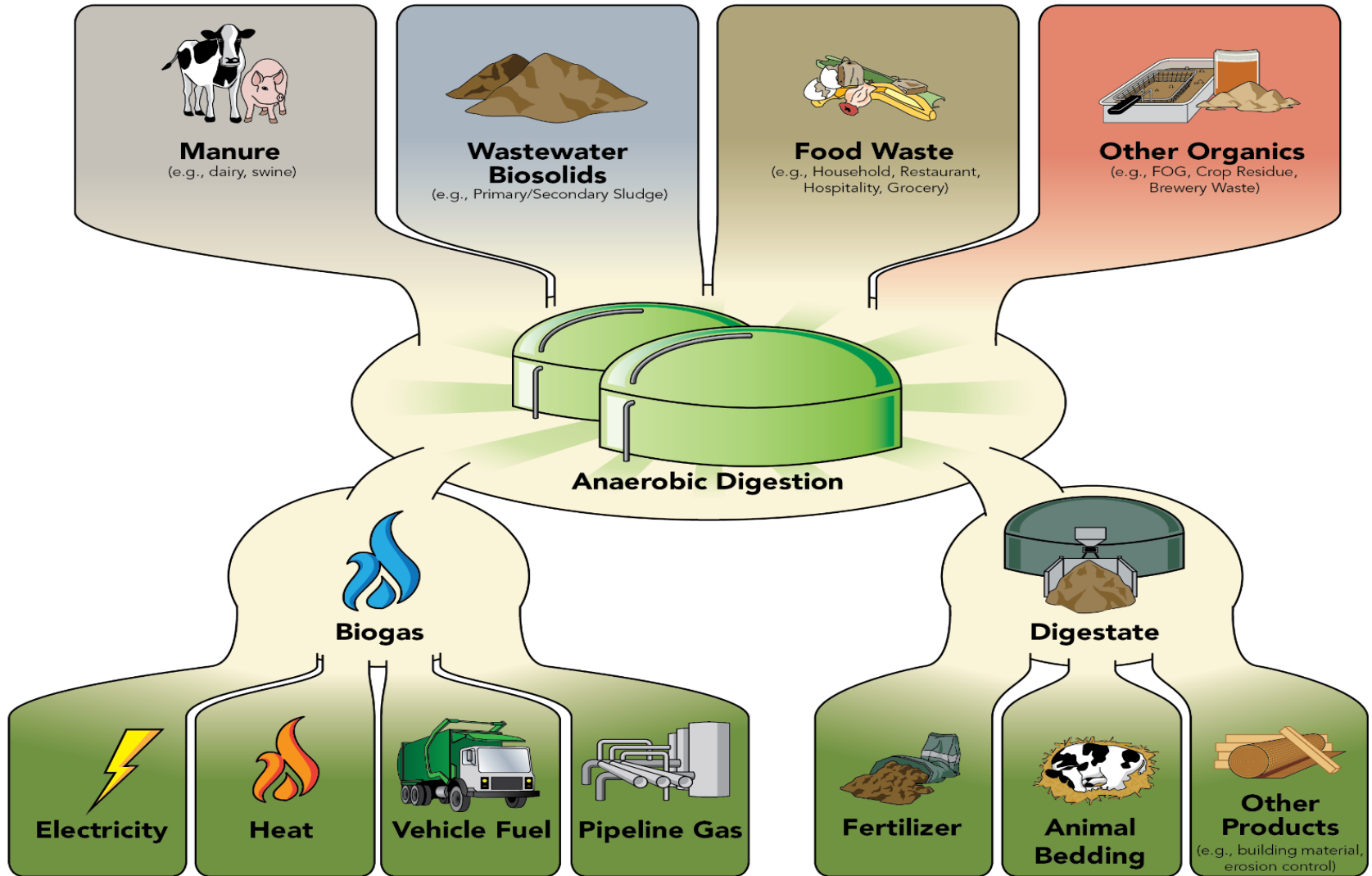


Biogas as a Waste Management Solution

Turning “Waste” into Resources

Patrick Serfass | Executive Director
May 23, 2018 | 340 Cannon HOB

How Biogas Systems Work



U.S. Biogas Market – Current and Potential

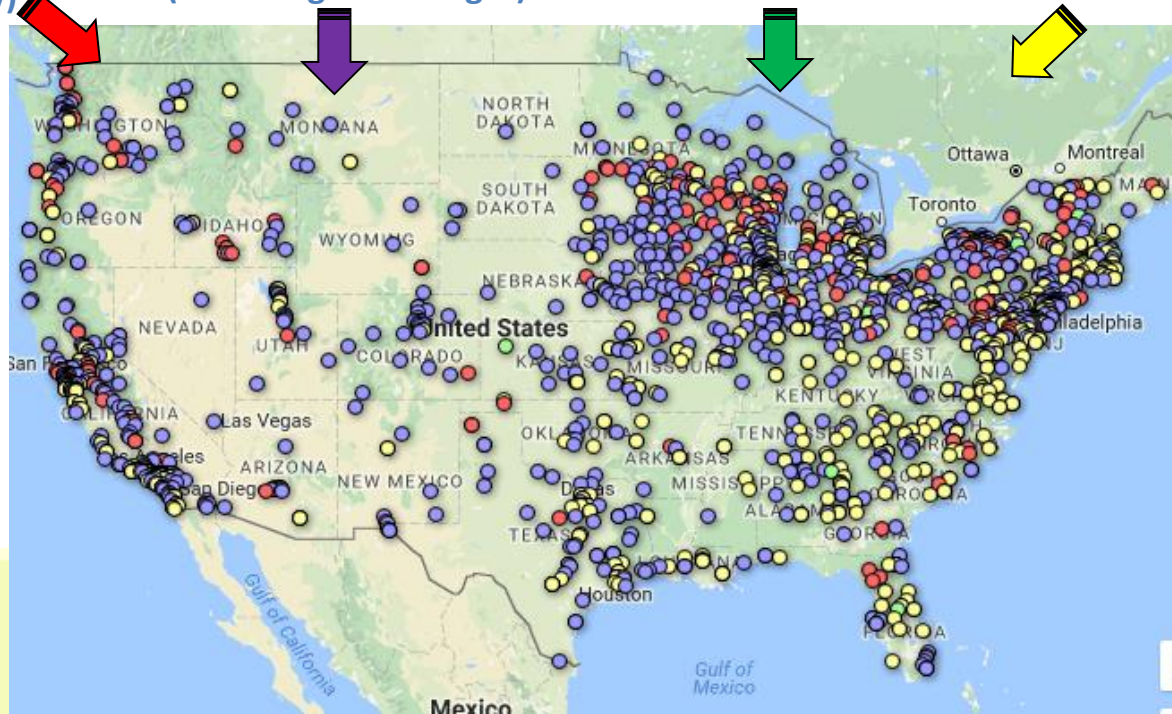
253
on Farm
(dairy, swine only)

1,269
Water
(860 using their biogas)

66
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

AD vs. Solar/Wind

Biogas/AD Systems Are Worth It

- **Capacity factor:**

- Solar: 17% ([EIA, NJ](#)) CapEx x 5.6
- Wind: 22% (average worldwide) CapEx x 4.3
- Biogas/AD: 95% (DOE, [UW](#)) CapEx x 1.1

- **How much are the non-energy benefits:**

- Organic material management
- Odor reduction
- Nutrient recycling
- Reduced or negative GHGs
- Watershed protection
- More jobs
- Ongoing supply chain activity

Don't care about supporting renewable energy?

- **With what infrastructure will we manage:**
 - 66,500,000 TONS of food waste each year
 - The sludge from 31 BILLION gallons of wastewater EVERY DAY
 - The manure AND NUTRIENTS from 8 BILLION cows, chicken, turkey and pigs
- **Where will the nutrients for US agriculture come from?**
 - 12,840,000 short TONS of nitrogen (N) needed
 - 4,321,000 short TONS of phosphate (P_2O_5) needed
 - Nitrogen is mostly made from ammonia using fossil fuels
 - Phosphorus mining in the US creates radioactive waste—or we import it
- **13,500 US Biogas Systems =**
 - \$40 billion in capital deployment
 - 335,000 short-term construction jobs and 23,000 permanent jobs

Let's work together to develop better policy

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