

Whole Cycle Tuesday

Key Takeaway

Anaerobic digestion is more than just waste treatment, it's a circular economy solution.

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"The environment is where we all meet; where we all have a mutual interest; it is the one thing all of us share." — Lady Bird Johnson

Anaerobic Digestion: Turning Waste Into Renewable Energy

Anaerobic digestion (AD) is a natural process with big potential for managing organic waste while creating renewable energy. It happens when microorganisms break down organic material, such as food scraps, manure, or wastewater sludge within an oxygen-free environment. The result? Biogas and nutrient-rich digestate.

How It Works

1. **Feedstock Input:** Organic materials are placed into a sealed tank, called a digester.
2. **Microbial Breakdown:** Bacteria consume the material, producing methane (CH₄) and carbon dioxide (CO₂).
3. **Biogas Capture:** This biogas can be burned for heat, used to generate electricity, or upgraded into renewable natural gas (RNG).
4. **Digestate Production:** What's left behind is a nutrient-rich substance that can be applied as a fertilizer or soil amendment.

- **Waste Management:** Provides a sustainable alternative to landfilling and incineration.
- **Nutrient Recycling:** Returns valuable nitrogen, phosphorus, and potassium back to soils.
- **Odor & Pathogen Reduction:** Helps stabilize organic waste streams and improves air quality around farms and facilities.

Applications

- Municipalities use AD to treat wastewater sludge.
- Farms process manure and crop residues for energy and fertilizer.
- Food processors and grocery chains divert organics away from landfills into digesters

Key Benefits

- **Renewable Energy Source:** Replaces fossil fuels and helps reduce greenhouse gas emissions.

