Flow
Water Advocates

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The hidden costs of anaerobic digesters and biogas.

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What are anaerobic digesters?

Anaerobic digesters are facilities that decompose organic waste, separating biogas from a sludge called "digestate." Biogas can be used on-site, paired with a facility like a livestock confinement, or processed into purified pipeline-grade biomethane for electricity or transportation. While biogas can be part of a sustainable farm operation, it has many potential shortfalls that must be evaluated carefully to protect the public interest.

On concentrated animal feeding operations (CAFOs), a digester may be a cover on a cesspit. After the methane is captured, CAFO operators spread untreated digestate — which may contain biological hazards like thermotolerant, antibiotic-resistant E. coli bacteria — onto farm fields as "fertilizer." Digesters fed by sources like municipal food waste may produce digestate that is contaminated by high levels of heavy metals and toxic compounds like PFAS and PFOS, which may then be sold or given away to spread on fields.

COVER: Swine feed at a factory farm operation. Photo Credit: CivilEats.

RIGHT: A worker walks through the chicken warehouse at a factory farm operation.

How to regulate anaerobic digesters.

To uphold Michigan's constitutional and statutory environmental protections, regulation must address all environmental impacts of biogas/biomethane production, including economic incentives to expand CAFOs, safe digestate disposal, and potential soil contamination and leaching to groundwater. Biogas emission calculations must at minimum include emissions from:

- Livestock operations that produce the waste fueling digesters,
- The anaerobic digester itself,
- Upgrading biogas to biomethane,
- Biogas transit, and
- Combustion of the final biomethane product.

The State must closely monitor the highly concentrated toxins discharged with digestate from anaerobic digesters. These pollutants contaminate water and threaten public and environmental health if left unchecked.

Finally, CAFO siting in rural communities and CAFO expansion enabled by enhanced local oversight and digester subsidies require environmental justice analysis.

RIGHT: Cows stand confined in narrow metal stalls, ankle-deep in filth, as a worker moves through the dim, grim conditions of a factory farm. Photo credit: CivilEats

10M

cows live in the state of Michigan, which is greater than the human population.

81M

Michigan CAFOs produce livestock waste equivalent to 81 million people, annually.

2.25M

Huron County (pop. 31,000) has livestock waste equivalent to 2.25 million humans.

When digester incentives go wrong.

A 2021 California Legislative Analyst's Office Report cast significant doubt on greenhouse gas (GHG) reduction claims by California's Dairy Digester Research and Development Program, which funds new digesters on dairy operations. Multiple departments in California's government claimed full credit for biogas emissions reductions, leading to double- and triple-counting. GHG reduction numbers also ignored emissions from biomethane combustion and the biomethane trucking fleet.

Given these uncertainties about the actual environmental benefits, Michigan should exercise caution in modeling its program on California's.

How should Michigan address anaerobic digesters co-located with CAFOs?

Michigan must pay close attention to unintended consequences caused by digester subsidies. Taxpayer-subsidized biomethane may perpetuate rather than reduce traditional fuel-based heavy-duty trucking – with negative climate and air quality impacts. Due to economies of scale, only very large CAFOs can take advantage of digester subsidies, disadvantaging small family farmers and further consolidating the meat and dairy industry. Partnerships between CAFOs and the fossil fuel industry can turn CAFOs into manure biogas producers that also happen to sell meat or dairy.

Such effects are not purely theoretical: A Battle Creek (MI) CAFO recently avoided liquidation by shifting its business model to focus on energy production, including a digester. To achieve genuine climate progress and accountability, Michigan's anaerobic digester policy should prioritize food health and security, animal welfare, and protecting our land and water.

Anaerobic Digester Terminology.

Aerobic digestion: The aerobic (oxygen-using) process of breaking down organic waste, and leaving behind water and dense solid waste (compost), can be a key part of an efficient, sustainable waste management system.

Anaerobic digestion: Systems that break down organic waste without oxygen, using microbes to turn it into biogas (mostly methane) and fertilizer.

Biogas: A mix of various greenhouse gasses (including methane and carbon dioxide) and other impurities. Typically not pipeline quality; instead used for on-site power needs.

Biomethane: Purified biogas, with all carbon dioxide, water, and non-methane impurities removed (that is, emitted through a conversion process).

Pipeline quality: often sent off-site from the original digestion location.

Digestate: The sludge and solid waste remaining after anaerobic digestion. Often applied to crops, eventually making its way to water bodies through runoff, drainage, and groundwater flows.

Flow Water Advocates is an independent 501(c)(3) nonprofit. Our mission is to ensure the waters of the Great Lakes Basin are healthy, public, and protected for all. With a staff of legal and policy experts, strategic communicators, and community builders, Flow Water Advocates is a trusted resource. We help communities, businesses, agencies, and governments make informed policy decisions, and protect public trust rights to water.

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