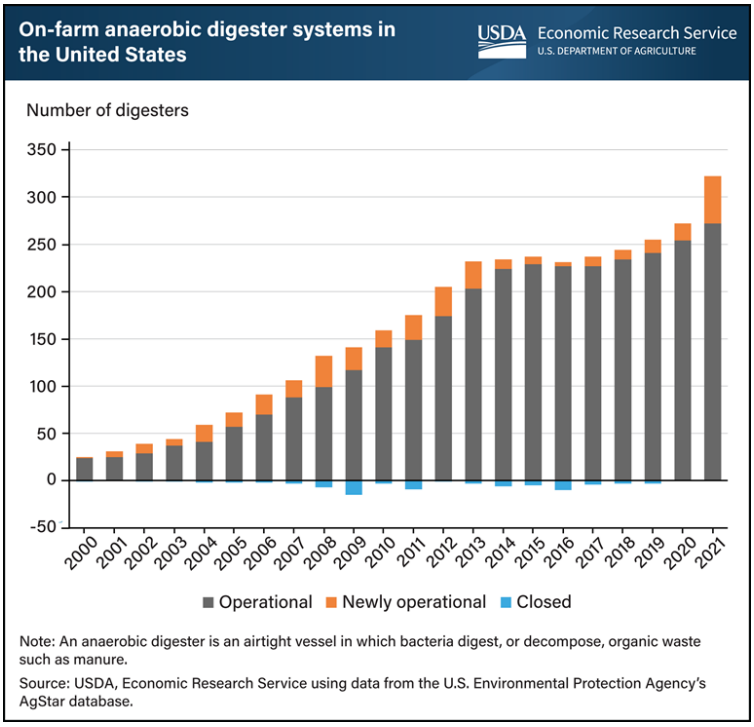
Pennsylvania Policy on Renewable Natural Gas (RNG) Using Anaerobic Digestion Systems in Agriculture

By: Mary Johnson[1]

This paper summarizes Pennsylvania policies that may facilitate the production of renewable natural gas (RNG) from on-farm anaerobic digestion (AD). Anaerobic digesters are sealed vessels enclosed to create an oxygen-free environment where microbes decompose organic waste, such as manure or vegetation, to produce biogas, which can be converted into electricity and heat or refined into RNG and sold as a renewable energy source.

Overview of Anaerobic Digestion in the United States



[2] The adoption of anaerobic digestion systems in the United States has steadily increased in response to rising demand for improved manure management, renewable fuels, and opportunities in carbon credit trading. This paper examines Pennsylvania's state-specific regulatory and policy landscape for AD systems, and briefly compares its policies with those of other states. Federal programs that may provide further incentives for AD are beyond the scope of this paper. According to AgSTAR, on-farm AD systems in the U.S. grew to 322 systems by the end of 2021, fueled by incentives such as California's Low Carbon Fuel Standard (LCFS). While AD adoption began in the 1970s, significant growth occurred in the 1990s, and then slowed in the mid-2010s. However, AD systems have resurged in recent years. Dairy farms represent the largest share of AD systems, with California, Wisconsin, and Pennsylvania leading in adoption.

Pennsylvania's Policy Incentives for RNG

As of 2023, Pennsylvania had approximately 466,000 dairy cows, accounting for 5.0% of the U.S. dairy herd. By mid-2023, the state hosted 30 active livestock AD systems, primarily on dairy farms. Twenty-one of these systems produce energy for cogeneration (combined electricity

---

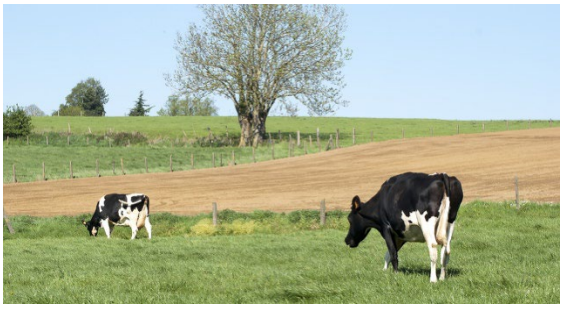
[1] Student at Penn State Law, J.D. Expected May 2025.

[2] Graphic from: U.S. Dep't of Ag., Economic Research Serv., Number of on-farm anaerobic digesters systems used to decompose organic waste has increased over time - Chart Detail, https://www.ers.usda.gov/data-products/chart-gallery/gallery/chart-detail/?chartId=106096 (last visited Nov 21, 2024).

and heat), while nine produce electricity without heat capture. Pennsylvania offers several incentives and funding mechanisms to support AD implementation:

1. **Alternative Energy Portfolio Standards (AEPS) Act**:
   Under AEPS, farmers participating in electricity markets can earn alternative energy credits (AECs) for electricity produced from AD. The Act mandates increasing percentages of electricity generation from Tier I renewable resources (including methane gas generated from AD). In 2023, AEPS required 14% of electricity sold in Pennsylvania to be generated from Tier I sources, rising to 16% by mid-2024.
2. **Small Business Advantage Grants (SBAG)**:
   SBAG offers support for projects aimed at improving energy efficiency, reducing pollution, or minimizing waste by upgrading existing systems or controlling agricultural runoff into waterways. Awards range from 50% or $5,000 (whichever is lower) to 80% or $8,000 (whichever is lower), based on environmental impact and the project's location, including Environmental Justice Areas. Eligible small businesses must have fewer than 100 full-time employees. Importantly, these grants can only be used to upgrade existing systems and cannot be applied to the construction of new anaerobic digesters.
3. **Small Business Pollution Prevention Assistance (PPAA) Loan Program**:
   This loan program supports projects that conserve raw materials, reduce waste at the source, or improve environmental practices. Livestock manure AD qualifies under the program's goals. Loans can cover up to 75% of total project costs up to a maximum of $100,000, with a maximum term of 10 years. Both the business and the project must be located in Pennsylvania, and the business must have fewer than 100 full-time employees.
4. **Resource Enhancement and Protection (REAP) Program**:
   Established in 2007, the REAP Program incentivizes conservation practices among agricultural producers through state tax credits. It aims to mitigate environmental impacts, particularly on water quality and soil health. Qualified applicants may receive state tax credits covering 25% to 75% of project costs, up to a maximum of $150,000 per agricultural operation. Eligible REAP projects include implementing best management practices (BMPs). Although the REAP guidelines do not explicitly mention AD, it generally falls under the definition of BMPs. Therefore, AD is likely to qualify as a BMP.

Regulatory Challenges



The Pennsylvania Department of Environmental Protection imposes strict reporting and monitoring requirements for AD systems that seek credit for carbon dioxide offset allowances from the Department of Environmental Protection. These systems are intended to ensure that the AD systems deliver the positive impacts anticipated. For example, **25 Pa. Code § 145.395** mandates monthly sampling of biodegradable organic food waste for volatile organic solids and metering of biogas flow rates, which can create cost burdens for small-scale farms. While state grants support system upgrades, funding for new installations and ongoing management remains limited.

Opportunities for Growth

Pennsylvania has supported growth in AD systems through initiatives like AEPS, SBAG, and PPAA. Programs from other states, like California's low carbon fuel standard, have demonstrated the potential of credit-trading markets to further incentivize RNG production. By incorporating similar market-based programs and expanding financial incentives for AD into a broad portfolio of sustainability efforts, Pennsylvania could further incentivize AD in the Commonwealth.

References

Number of on-farm anaerobic digesters systems used to decompose organic waste has increased over time, USDA ERS - Chart Detail, https://www.ers.usda.gov/data-products/chart-gallery/gallery/chart-detail/?chartId=106096 (last visited Nov 21, 2024).

AEPS Act, PA PUC, https://www.puc.pa.gov/filing-resources/issues-laws-regulations/aeps-act/ (last visited Nov 21, 2024).

USDA, Economic Research Service calculations using USDA, National Agricultural Statistics Service data, https://www.ers.usda.gov/webdocs/DataFiles/48685/milkcowsandprod.xlsx?v=808.

Small business advantage grant, Department of Environmental Protection, https://www.dep.pa.gov/Citizens/GrantsLoansRebates/SmallBusinessOmbudsmanOffice/Pages/Small%20Business%20Advantage%20Grant.aspx (last visited Nov 21, 2024).

PPAA loan program, Department of Environmental Protection, https://www.dep.pa.gov/Citizens/GrantsLoansRebates/SmallBusinessOmbudsmanOffice/Pages/PPAA%20Loan.aspx (last visited Nov 21, 2024).

The Resource Enhancement & Protection (REAP) Program, https://www.pa.gov/en/services/pda/apply-for-the-resource-enhancement---protection--reap--program.html (last visited Nov 21, 2024).

Ekram Korkut et al., *The Regulatory Landscape of Livestock of Anaerobic Digesters and Renewable Natural Gas (RNG)*, 15 Journal of Animal and Environmental Law (2023).

25 Pa. Code § 145.395. CO2 emissions offset project standards, Pennsylvania Code, https://www.pacodeandbulletin.gov/Display/pacode?file=%2Fsecure%2Fpacode%2Fdata%2F025%2Fchapter145%2FsubchapEtoc.html&d= (last visited Nov 21, 2024).

Acknowledgement: This work is funded as part of C-CHANGE (the Consortium for Cultivating Human and Naturally reGenerative Enterprises), a collaborative initiative focused on empowering farmers to produce renewable natural gas through anaerobic digestion of perennial and winter biomass crops and animal manure. C-CHANGE is supported in part by Sustainable Agricultural Systems grant number 2020-68012-31824 from the United States Department of Agriculture National Institute of Food and Agriculture. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture. https://nifa.usda.gov/