

# Directed Biogas in Delmarva

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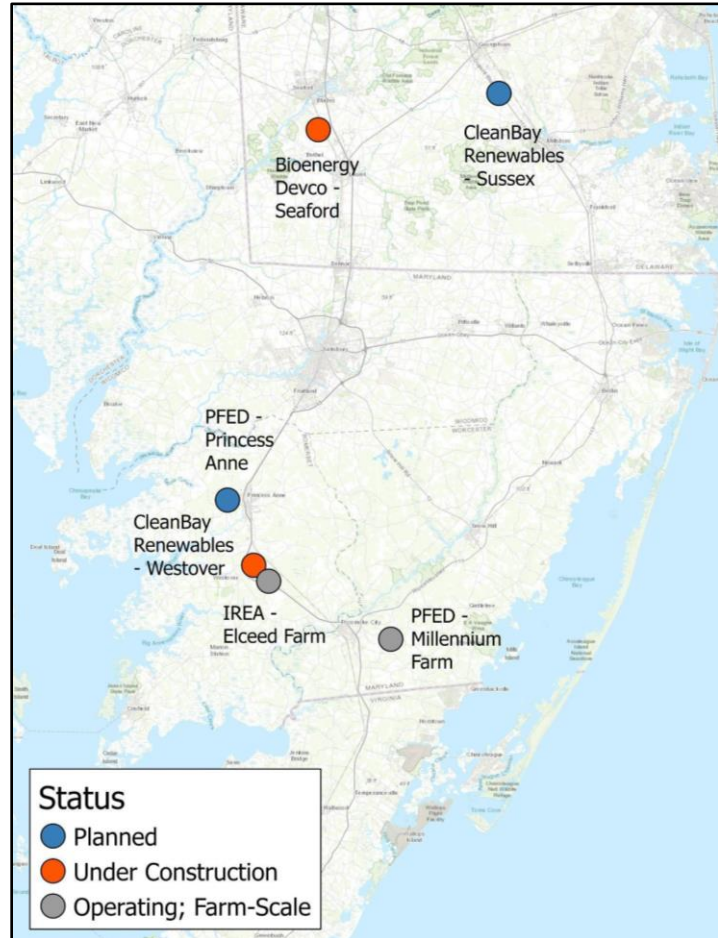
## What is Biogas?

- **Biogas** is primarily methane but can also include other gases like carbon dioxide and hydrogen sulfide and is produced when organic material like farm animal waste breaks down. Its uses are similar to natural gas and include heat and electricity generation, fuel, and plastics.<sup>1</sup> When biogas is combusted for electricity generation, it can produce harmful air pollutants like nitrogen oxides, just like combusting fossil fuels.<sup>2</sup>
- Biogas is primarily produced through a process called **anaerobic digestion**. In this process, microbes break down organic matter, like poultry litter and livestock manure, in an anaerobic digester, producing biogas and solid and liquid byproducts called “digestate.” The digestate can be used for things like fertilizer, crop irrigation, and animal bedding, but is not beneficial where cropland cannot absorb additional nutrients without contributing to water pollution, like on much of Maryland’s lower Eastern Shore, or if digestate itself is contaminated.<sup>3</sup>
- “**Directed biogas**” describes biogas or methane captured from anaerobic digesters and “directed” or delivered to natural gas pipelines for power generation elsewhere, rather than being used for heat and electricity on-site/on the farm.

## Factory Farm Biogas Plants in Delmarva

- Two large-scale factory farm biogas facilities are already under construction on the Delmarva Peninsula, and at least another two have been proposed. The projects aim to process thousands of tons of poultry litter from farms in the area and distribute the biogas to the power grid. Two small-scale projects are already operating on individual farms, but do not feed into the power grid off-site.
- Major, directed biogas projects include:
  - **CleanBay Renewables Westover facility (Under Construction):** CleanBay’s Westover facility being built in Westover, MD, south of Princess Anne, was initially proposed as a manure-to-energy biogas plant processing under 30,000 tons of manure a year in 2016 but expanded to over 150,000 tons annually as of 2022. The project received \$1.4 million in public funding from the state in October 2016. CleanBay will distribute the gas through Chesapeake Utilities’ gas pipelines.<sup>4</sup> Sixty-seven percent of the population within a three-mile radius identify as people of color and 43 percent live in low-income households.
  - **CleanBay Renewables Sussex facility (Planned):** CleanBay’s Sussex facility in Georgetown, DE could process more than 150,000 tons of poultry litter annually, producing biogas for the Delaware Electric Cooperative.<sup>5</sup> Twenty-nine percent of the population within a three-mile radius identify as people of color and 24 percent live in low-income households.

- **Bioenergy Devco Seaford facility (Under Construction):** Bioenergy Devco’s biogas facility near Seaford, DE will process poultry litter, up to 220,000 tons waste from poultry processing plants per year, and other organic materials. The company will receive waste from Perdue, and biogas will be transferred to Chesapeake Utilities and their natural gas pipelines. The plant could generate up to 60,000 gallons of treated wastewater daily, which could be transported to a county wastewater facility, discharged into a central sewer system, or used for spray-irrigation.<sup>6</sup> Forty-two percent of the population within a three-mile radius identify as people of color and 39 percent live in low-income households.



- Bioenergy Devco and CleanBay Renewables have agreements with Chesapeake Utilities Corporation to deliver biogas through pipelines on the Delmarva Peninsula, including a new pipeline expansion in Wicomico and Somerset counties.<sup>7</sup>

### Environmental Risks from Factory Farm Biogas

- Though biogas proponents tout benefits of capturing methane from factory farm manure as a “renewable” and clean natural gas, the process is not without environmental problems. The gas itself is comparable to fracked natural gas, causing similar environmental harm. Research estimates 2 to 4 percent of methane, a potent greenhouse gas contributing to climate change, is lost to the atmosphere in leaks during biogas production; in some cases, up to 15 percent.<sup>8</sup> By comparison, studies show methane leaks from fossil fuel-based natural gas could range from 1.4 to 3.7 percent.<sup>9</sup>
  - A 2 to 15% leak rate from the major directed biogas projects on the Eastern Shore would release an estimated 692 to 5,187 metric tons of methane – comparable to the greenhouse gas emissions from 12,517 to 93,880 gas-powered cars on the road all year.<sup>10</sup> These potential leaks could completely offset the reductions from Maryland’s plan to reduce methane leaks from the natural gas industry, estimated to reduce 600 to 5,000 metric tons of methane from compressor stations, liquefied natural gas facilities, and storage facilities.<sup>11</sup>

- Several factors play into whether biogas plants processing poultry litter produce lower greenhouse gas emissions than other manure treatment options like compost, storage, and incineration. Low emissions would require closed digestate storage tanks, minimizing leaks throughout the infrastructure, mixing poultry litter with other types of organic waste, and cutting the time poultry litter is stored at a poultry operation. While some of these practices are seen in operations in Europe, they do not accurately reflect conditions in the U.S. For example, poultry operations in the U.S. generally store poultry litter for longer and clean houses less frequently, which also increases ammonia and nitrous oxide pollution.<sup>12</sup> Nitrous oxide is a potent greenhouse gas.
- Directed biogas entrenches factory farms into fossil fuel infrastructure, including the pipelines, processing plants, compressors, and trucks necessary to connect the biogas plants to gas transmission and distribution systems that ultimately feed power plants, home appliances, and vehicles.<sup>13</sup> These natural gas systems that would receive directed biogas are also notorious emitters of methane and other health-harming air pollutants.<sup>14</sup> The volume of gas they can generate is also miniscule in comparison to the amount flowing from oil and gas wells.
- Research indicates anaerobic digestion could contribute to greater emissions of ammonia, a pollutant that can contaminate water quality and ecosystems, or contribute to air pollution that can harm local communities. Agriculture is a major source of ammonia emissions but lacks adequate regulation from the government.<sup>15</sup>
- Biogas facilities would create a waste stream that is not well suited for the Eastern Shore of Maryland. Digestate, a byproduct of anaerobic digestion, can contain concentrated nutrients like phosphorus, which is harmful when applied as a fertilizer in areas with already high soil phosphorus levels. Overapplying phosphorus-rich manure from poultry operations has already polluted waterways and the Chesapeake Bay.<sup>16</sup> Digestate may also contain other contaminants, depending on what is used to produce biogas. A clear characterization of the waste should be better understood before applying digestate to land.
  - There is limited research on PFAS (per- and polyfluoroalkyl substances or “forever chemicals”) in digestate. However, what research is available indicates that PFAS concentrations in feedstock (i.e., what goes into the anaerobic digester) are a key determinant of PFAS concentrations in digestate.<sup>17</sup> The few studies that have measured PFAS in various organic wastes have found low concentrations in poultry litter and similar agricultural wastes, especially compared to other wastes, such as biosolids (“sewage sludge”).<sup>18</sup>

## Biogas and the Maryland Renewable Portfolio Standard

- **Renewable Portfolio Standards** require electric utilities to acquire a minimum portion of their electricity sales from renewable energy sources by purchasing renewable energy credits from eligible sources. States can determine what portion must be renewable and what energy sources are considered renewable. By requiring utilities to purchase these credits, the state effectively creates a market, or subsidizes, the eligible sources.<sup>19</sup>
- Maryland’s Renewable Portfolio Standards require 50 percent of the state’s electricity to come from “Tier 1” renewables by 2030. While this includes traditional clean energy sources like wind, solar, and geothermal energy, Maryland also considers as “Tier 1” more problematic sources like waste-to-

energy incinerators, poultry litter-to-energy, and biomass, which includes gas produced from anaerobic digestion of animal and poultry waste.<sup>20</sup>

- By considering biogas from poultry waste and other waste-to-energy sources a qualifying renewable energy in Maryland, the state is supporting or subsidizing a dirty energy source when better, cleaner alternatives like wind and solar exist. Environmental organizations across the state are working to remove biomass and waste-to-energy incineration from the list of eligible energy sources.

## Maryland Animal Waste Technology Fund

- The Maryland Department of Agriculture (MDA) provides grant money to companies to research or pilot new technologies to manage animal waste through the Animal Waste Technology Fund. Since 2014, the Fund has granted over \$10 million to projects that use animal waste to generate energy or make fertilizer or reduce waste streams.<sup>21</sup>
- In 2016, the MDA awarded CleanBay Renewables \$1.4 million to process 80 tons of poultry litter per day into biogas and fertilizer (capacity has since increased significantly).<sup>22</sup>
- In 2014, the MDA awarded over \$675,000 to Planet Found Energy Development to build an on-farm, pilot-scale anaerobic digester at the Millennium Farms poultry operation, focused on testing technology to capture and separate out phosphorus in the resulting fertilizer. High capital costs make farm-scale anaerobic digestion financially infeasible.<sup>23</sup> However, Planet Found is considering another larger scale facility near Princess Anne, MD.
- In 2022, Earth Care LLC was promised \$2.4 million Maryland taxpayer funded dollars to propose putting a digester in a historic African American community in Wicomico County. This population also consists of people with significant language barriers, who also live next to a landfill. Back door deals were being proposed to also take sewage sludge, to offset the tipping fees at the direct expense of the neighborhoods living nearby within the 80% percentile of hazardous waste proximity and Air Toxics risks. In addition, they also tried to get permitted under a special exception as a 'composting facility'. Luckily, through much advocacy we were able to get the Maryland Department of Agriculture to pull this funding.

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### About the Organizations

The *Environmental Integrity Project* is a nonprofit, nonpartisan organization, based in Washington, D.C., dedicated to the enforcement of environmental laws and strengthening of policy to protect public health and the environment.

*Assateague Coastal Trust* is a nonprofit organization on the lower Eastern Shore. For over 50 years ACT has been working arm in arm with diverse community partners to protect and defend the health of Delmarva's coastal waters through advocacy, education, science, and the enforcement of just and equitable clean water laws.

## Questions?

Assateague Coastal Trust

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