ENERGY FORWARD PROJECT

Progress or Politics Report

No 1. BIOGAS

Just the facts, please. Meaningful progress on climate change will require us to remove politics from energy and climate policy - to let facts and science, not politics be our guide when so much is at stake.

In this first edition of the **Progress or Politics Report**, we break down some of the recent dialogue around a heavily debated anaerobic digestion project in Seaford, Delaware. Our goal for this and future reports is to provide enough data and material from reputable, unbiased sources (along with some old-fashioned rational thinking) that even your average non-climate-scientist (most of us...) can make their own informed decisions about the best path towards a more sustainable energy future.

Progress or Politics? Biogas in Seaford

A blog post titled Debunking Delaware Biogas: The Truth Behind Industry Lies was recently published in response to a community workshop held by the Delaware Department of Natural Resources (DNREC) to discuss a proposal for a new anaerobic digestion facility at a poultry farm in Seaford. Each section below relates directly to a headline statement in the blog. After reading, you can be the judge: does this "debunking" support progress?

QUOTED FROM "DEBUNKING BIOGAS"

"Biogas Digesters Won't Make the Factory Farm Pollution Disappear"

This statement is 100% true. Biogas digesters (aka anaerobic digesters) will not put an end to unsustainable farm or soil management practices. Just like wind and solar power have not yet put an end to carbon-intense fuel sources. But is this a viable argument against a proven technology that is considered a renewable energy source by the EPA?

The anaerobic digester in question will recycle chicken waste (organic waste), which often results in emissions and water runoff when land applied, and turn it into biogas and digestate. The latter can be applied to agricultural land as a replacement for chemical fertilizers or used as a soil amendment to improve soil health. Anaerobic digestion has also proven to be quite effective in reducing the incidence of waterborne pollutants because it deactivates the pathogens and parasites typically present in organic waste.

Agricultural soils and groundwater pollution in Delaware

The management of agricultural soils accounts for just over half of the GHG emissions from the agriculture sector, which was responsible for 11% of total GHG emissions in the U.S. in 2020. Anaerobic digestion can help eliminate groundwater pollution caused by excessive land application of nutrients and landfill operations, minimizing excessive nutrient runoff that can poison ecosystems and cause human health issues. Delaware's thousands of acres of phosphorus-enriched farmland in Sussex and Kent counties – as well as the state's challenges with nitrogen-laden fertilizer operations south of the Chesapeake and Delaware Canal – speak to the urgent need for more sustainable solutions like anaerobic digestion.

The CAFO question

A common argument from those who oppose the use of anaerobic digestion on farms is that by providing a solution to reduce the environmental impacts of CAFOs (Confined Animal Feeding Operations), we are perpetuating the problem by allowing livestock facilities to continue with unsustainable habits. This is fair, but let's look at this another way. According to the USDA, there are approximately 450,000 Animal Feeding Operations in the U.S., which were responsible for approximately 7% of U.S. GHGs in 2020. If we consider the reality that significant reductions in the number of livestock we process for human and other consumption is unlikely in the near future, it seems critical that we do everything in our power now to minimize air and water pollutants from these operations.

TOPLINES:

- Transitioning away from polluting disposal methods like land application of organic waste can yield immediate, tangible impacts on the environmental health of Delaware's communities.
- Anaerobic digestion is considered by the EPA to be an effective and sustainable approach to addressing organic waste and runoff from land application.

QUOTED FROM "DEBUNKING BIOGAS"

"Biogas Will Ramp Up Dangerous Methane Pollution"

This statement is counter to the science. The process of anaerobic digestion, which captures and utilizes biogas from organic waste that would otherwise be left to rot in landfills, is designed to mimic the naturally occurring digestion process of say, a cow's stomach, to effectively reduce methane from organic waste in the atmosphere. But let's take a step back.

While experts across the globe agree that the climate benefits of anaerobic digestion are clear, some express concern about whether the delivery of biogas through existing pipelines will perpetuate the use of natural gas infrastructure. This is a fair argument, but one that deserves a closer look. The same could be said for wind and solar power, which travel across existing electric infrastructure (e.g. – electric towers). While none of these renewable energy sources are capable of completely replacing traditional fuels today, each has an important role to play on the path to a more sustainable energy future.

On the topic of we don't have time to pass on proven solutions to climate change while we wait for the elusive, perfect answer, consider for a moment that in Delaware "between 2005 and 2017, emissions from the electric power sector, which relate to all electricity consumed in the state, decrease from 44% of total emissions to only 26% of total emissions primarily due to a transition to electricity generated from natural gas." (Delaware Climate Action Plan Supporting Technical Greenhouse Gas Mitigation Report, 2020)

Because natural gas emits about 40% less GHGs than oil when used as a fuel for generating power, it has allowed us to make significant emissions reductions in Delaware's energy sector. Is it perfect? No. Is it part of a holistic and immediate solution to climate change capable of meaningful emissions reductions now? The data suggests yes. This natural gas example highlights an important question: Are we leaving leaving game-changing solutions – and a lot of carbon emissions – on the table when we ignore technologies that are available to us now?

> **"Promoting the use of technologies like anaerobic digestion will help meet the methane emissions goals set by the Biden Administration."**
>
> **– United States Environmental Protection Agency (EPA)**

Now back to biogas... Once upgraded to Compressed Natural Gas (CNG) by converting methane from organic waste to CO2 (34 times less potent than methane), biogas can be used as a fuel in any passenger or heavy-duty vehicle to achieve upwards of 70% greenhouse gas emission reductions when compared to gasoline. (These emissions reductions remain even greater today than that of electric cars due to the non-renewable sources used for the generation of electricity.)

Directly counter to the assertion in this section of the blog that "methane produced by the Delaware project will have the same climate impact as a passenger car driving nearly 100 million miles per year," the Environmental and Energy Study Institute (EESI) reports that "The reduction of methane emissions derived from tapping all the potential biogas in the United States would be equal to the annual emissions of 800,000 to 11 million passenger vehicles." In a state like Delaware, where emissions from the transportation sector top the list of GHG emission sources, this feels important!

TOPLINES:

- According to the EPA, the use of technologies like anaerobic digestion will help meet the methane emissions goals set by the Biden administration.
- Biogas reduces two critically important greenhouse gases — carbon dioxide (CO2) and methane (CH4). This can be in the form of direct displacement in the pipeline by injecting RNG into the natural gas supply, or in transportation by replacing diesel with CNG.
- In addition to displacement, the biogas process can capture and convert upstream methane emissions to renewable energy. Methane abatement strategies are critically important in agriculture for manure management, as well as at municipal landfills that flare their captured gas.

QUOTED FROM "DEBUNKING BIOGAS"

"Biogas is No Better Than Fracked Gas"

While it is true that renewable natural gas (RNG, a product of biogas) is chemically identical to natural gas from other sources, it is created differently and yields fewer life cycle GHG emissions.

Get ready for the important piece here: While the *delivery* of energy in all its forms results in some level of carbon emissions, there are no emissions from the fully enclosed anaerobic digestion process that *creates* biogas. Rather than extracting gas from the ground, biogas is produced from existing waste streams and a variety of renewable and sustainable biomass sources, including animal waste, crop residuals and food waste.

TOPLINES:

- RNG, CNG and LNG, all derived from biogas, are considered carbon-neutral fuels because they are made from organic sources that once absorbed carbon dioxide from the atmosphere during photosynthesis or that would otherwise decay and create methane emissions when landfilled, and thus capture more greenhouses gases than they emit.

- Because the anaerobic digestion process that creates biogas captures and uses the methane that would have escaped into the atmosphere, it is considered a renewable resource both by the EPA and within Delaware's Renewable Portfolio Standard (RPS).

QUOTED FROM "DEBUNKING BIOGAS"

"Biogas Is Nowhere Close to Clean or Renewable"

Let's get straight to the data on this one. According to the EPA's Life Cycle Assessment (LCA) tool, a comprehensive method for assessing a range of environmental impacts across the full life cycle of a product system, from materials acquisition to manufacturing, use and final disposition, renewable natural gas from biogas (or RNG) has one of the lowest CI scores (carbon intensity) of any clean energy source today.

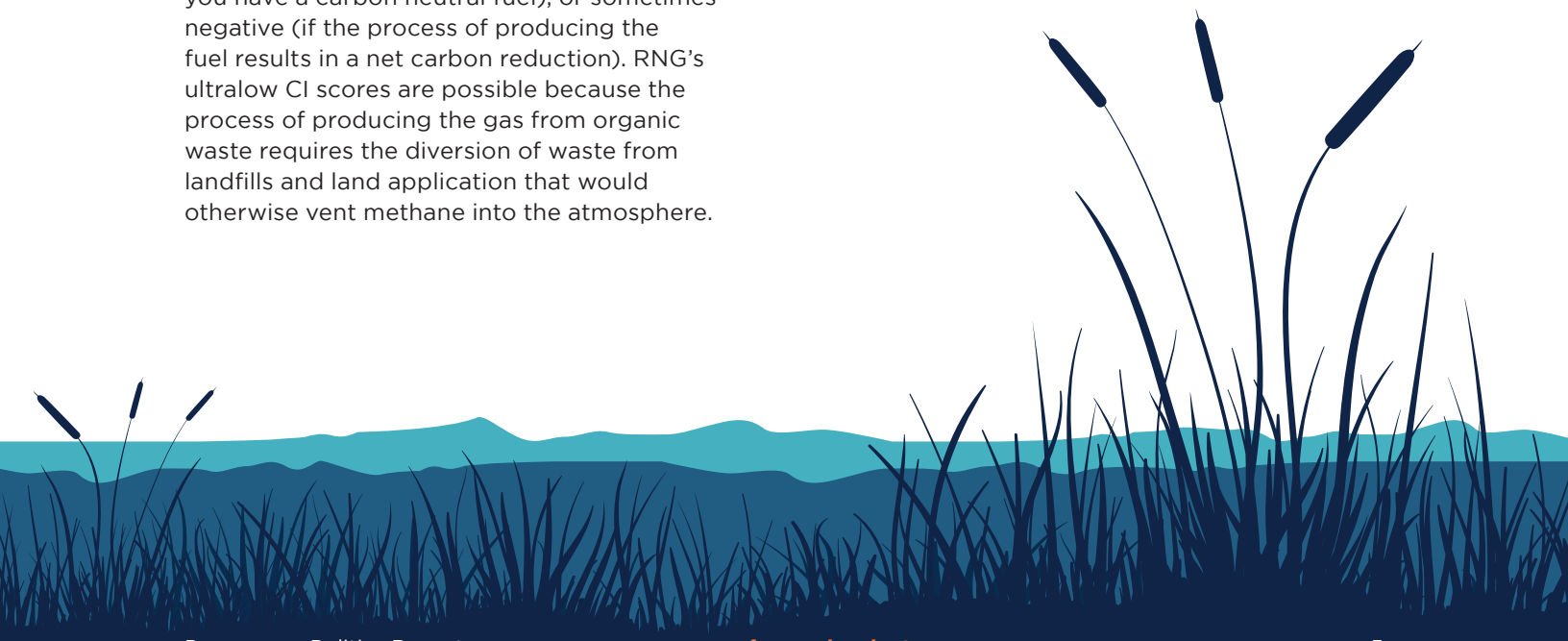
> **"Biogas is a renewable source of energy."**
>
> **– United States Environmental Protection Agency (EPA)**

The CI of burning any fuel is the net grams of carbon dioxide equivalent (CO_2e) emitted per megajoule of energy. The CI score of a fuel includes Scope 1, 2, and 3 emissions for that fuel. Therefore, even if your Scope 1 is zero from burning RNG from biogas, your net emissions from the CI score could be positive, zero (if you have a carbon neutral fuel), or sometimes negative (if the process of producing the fuel results in a net carbon reduction). RNG's ultralow CI scores are possible because the process of producing the gas from organic waste requires the diversion of waste from landfills and land application that would otherwise vent methane into the atmosphere.

Fuel pathways from biogas have CI scores ranging from -100 to -400 gCO_2e/MJ, which means the process of producing it results in a net carbon reduction. By comparison, petroleum diesel typically has a CI of 100 gCO_2e/MJ. This means that combusting a megajoule of petroleum diesel releases about 100 gCO_2e and 70 gCO_2e, respectively, whereas, combusting a megajoule of RNG from manure prevents the release of 100 to 400 gCO_2e into the atmosphere.

TOPLINES:

- Biogas is a renewable source of energy that can be generated cleanly from organic waste without any burning or emissions.
- The production and use of biogas reduces greenhouse gas (GHG) emissions and air pollution associated with energy production and helps diversify the nation's energy supply.



QUOTED FROM "DEBUNKING BIOGAS"

"We Don't Need 'Carbon Negative' If We Stop Pollution at the Source"

We do need carbon negative – and a lot more of it. But let's look at this statement from two angles. First, it doesn't get much more "*stopping pollution at the source*" than anaerobic digestion, where the source – food waste – is expected to continue growing exponentially and contributing significantly to GHG emissions without major advances in our work towards zero waste. Second, there are unfortunately some industries, like heat, transport, waste management and agriculture that for various reasons have proven quite difficult to decarbonize without technological advances like anaerobic digestion and the lower-carbon fuels it produces.

Straight talk on landfills and food waste

According to the EPA, in 2020, 30% of human-caused methane emissions in the U.S. stemmed from organic wastes at farms, landfills and wastewater facilities. Organic waste currently makes up 21% of U.S. landfills where it produces methane, a GHG at least 80 times more potent than CO2, as it breaks down. While high-performing landfills can capture some of this gas, landfilling organic waste offers no opportunity to recycle and reuse the biogas created as a more renewable energy source.

> **"Agricultural, industrial, and human digestion create organic wastes that emit methane, a powerful greenhouse gas, as they decompose. One option is to control decomposition in sealed tanks called anaerobic digesters that employ microbes to transform organic waste into biogas, an energy source, and digestate, a nutrient-rich fertilizer. Biogas can displace fossil fuels for heating and electricity generation or be used in vehicles that would otherwise rely on natural gas. Digestate supplants fossil fuel-based fertilizers while improving soil health."**
>
> – Project Drawdown

In 2015, the EPA and USDA set goals to reduce the amount of food waste sent to landfills by 50 percent by 2030. Even if this goal is met, there will be excess food that must be more sustainably managed. To address our food waste emergency, EPA's Food Recovery Hierarchy prioritizes source reduction first, followed immediately by food waste recycling with processes like anaerobic digestion and composting. Because composting is not yet available at scale, the EPA gives anaerobic digestion a slight leg up on composting as the most sustainable method available today for managing unavoidable organic waste.

Those hard-to-decarbonize sectors

Hard-to-decarbonize sectors like shipping, aviation, heavy-duty trucking and industrial processing with heat requirements that can't be addressed with electricity will require us to develop and use other sources of lower-carbon energy to reach our climate goals. As one tool in the fight against climate change, anaerobic digestion technology has proven effective in cutting GHG emissions from these hard-to-decarbonize sectors, including for heat (RNG from biogas), transport (CNG/LNG from biogas), waste management and agriculture (landfill diversion).

TOPLINES:

- As the human population and the impacts of climate change grow, anaerobic digestion technology can help reduce the carbon footprint of and recover nutrients from organic waste, while facilitating a more rapid transition to lower-carbon fuels.

- Achieving zero waste through source reduction and consumption change is critical but will take decades to accomplish at scale. To successfully limit the urgent impacts of global warming from food and farm waste, we must do everything in our power to reduce GHGs as soon as possible. Recycling these organics with anaerobic digestion is a technology that we have the ability and power to implement within a short timeframe.

Summary

Progress or Politics? **Politics**

The author includes several scientifically inaccurate statements that, when consumed and trusted without question or context, could serve to perpetuate our lack of meaningful progress in the fight against climate change.

To meet our necessarily ambitious climate goals, we must make huge leaps in cleaner energy innovation and be proactive in the deployment of proven technologies like anaerobic digestion and biogas to generate more sustainable energy, reduce emissions from organic waste and manage nutrients in our soils and waterways. As we continue the work towards zero emissions and debate the merits of decarbonization strategies, it is critically important that we understand how different sources of energy are produced and how this impacts GHG emissions in the atmosphere. If not, we will continue to ignore – or worse, continue to weaponize existing opportunities for progress, while we remain far behind in efforts to reach our urgent climate goals.

About The Energy Forward Project

The **Energy Forward Project** is a campaign of **Consumer Energy Alliance**

(CEA), the leading voice for sensible energy and environmental policies for consumers, bringing together families, farmers, small businesses, distributors, producers and manufacturers to support America's environmentally sustainable energy future.

In partnership with businesses and organizations across Delaware, the Project is working to empower citizens with the information and tools required to move past the politics and division of energy and climate policymaking today towards a more sustainable energy future. Learn more at **energyforwardproject.org**.