

**COMMENTS OF THE PARTNERSHIP FOR POLICY INTEGRITY, INC.
TO THE VERMONT PUBLIC UTILITY COMMISSION**

Re: Case. No. 24-3359-INV

**Investigation of the standard-offer contract
between Vermont Renewable Gas, LLC and the
Standard Offer Facilitator**

February 13, 2025

Introduction

The Partnership for Policy Integrity, Inc. (PFPI) commends the Vermont Public Utilities Commission for requiring a full 30 VSA Section 248 review of the proposed Vermont Renewable Gas biomass energy facility in Lyndon, Vermont, and for opening an investigation into whether the proposed facility is eligible for a Standard Offer contract as a “farm methane” plant. PFPI is a nonprofit environmental organization based in Massachusetts that has extensive experience reviewing biomass power plants and policies related to bioenergy.

PFPI has reviewed VRG’s responses to the Commission’s requests for information and briefing, along with the briefs submitted by other agencies and parties. Our comments address:

- (1) Ratepayer concerns;
- (2) Feedstock sourcing;
- (3) Industrial methane production;
- (4) Climate benefits of the farm methane Standard Offer program; and,
- (5) Air pollution concerns.

(1) Ratepayer Concerns

Biomass power plants are extremely expensive to build and operate. The average levelized cost of electricity (LCOE) from biomass in the US is more than twice that of on-shore wind, natural gas, geothermal, or stand-alone solar.¹ In general, biomass power plants cannot compete in energy markets without access to on-going government subsidies and/or long-term power purchase agreements.

In our review of the top 25 biomass power plants that received \$10,000,000 or more through the 2009 federal stimulus, PFPI found that even with hefty federal and state subsidies, many of the largest biomass power plants closed due to excessive costs and inability to compete with more

¹ U.S. Energy Information Administration, Levelized Costs of New Generation Resources in the Annual Energy Outlook 2022, March 2022, Table 1b, at https://www.eia.gov/outlooks/aeo/pdf/electricity_generation.pdf.

economic alternatives. Most of these plants were also found to contribute to air, water, dust and/or noise pollution in their communities, and many experienced accidents and fires.²

This is relevant to this investigation because, as the Department of Public Service (DPS) noted in its brief submitted January 23, 2025, “from a ratepayer perspective, the additional costs from expanding the [farm methane] category may not come with commensurate benefits.” DPS further advised “the potential cost impacts alone weigh in favor of great caution.”³

The category of this facility would not be in question were it not for the company’s efforts to access subsidies through the Standard Offer farm methane program. Based on the feedstock and the technology, it is obviously a biomass plant.

Subsidies are essential for this project. In a 2023 interview with *Waste Dive*,⁴ Kam Mahdi, CEO of CETY, noted that they selected Vermont for their first pyrolysis system because “we were looking for locations where they were offering incentives. That’s a prerequisite because these solutions are very expensive and very hard to economically justify without having any sort of incentive or long-term power purchase agreements in place.” In the same interview, Mahdi mentioned that his company is looking at additional sites in Vermont.

If the proposed facility were to qualify as a farm methane facility, it would open the door for more proposals of this kind should the Standard Offer program be reauthorized by the Legislature. Ratepayers should not be forced to subsidize a technology that is risky, highly polluting, incredibly expensive, and does not advance the goals of the farm methane program, as we discuss below.

² Mary S. Booth and Brett Leuenberger, *The Bioenergy Boom from the Federal Stimulus: Outcomes and Lessons*, October 2018, at <https://www.pfpi.net/wp-content/uploads/2018/10/PFPI-Bioenergy-and-the-Stimulus-Oct-24.pdf>

³ Brief of the Vermont Department of Public Service, Case No. 24-3359-INV, 1/23/25, pp. 11 and 12.

⁴ Jacob Wallace, “Clean Energy Technologies, newly public, is working to scale pyrolysis in the United States,” June 2, 2023, *Waste Dive*, at <https://www.wastedive.com/news/kam-mahdi-clean-energy-technologies-cety-pyrolysis-rng/651851/>

(2) Feedstock Sourcing

The primary feedstock will be wood, which would typically make this a biomass facility. However, to qualify for the “farm methane” Standard Offer contract, VRG claims that at least 51% of the feedstock will come from agricultural operations, including timber harvested from woodlots on farms.

A supplement to the company’s Standard Offer application, titled “Supplemental Material - Feedstock Sourcing,” states that “at least 80% of the project feedstock will come in the form of wastes and products derived from Agricultural Operations. These Agricultural Operations are engaged in the cultivation or other use of land for the growing of fiber, Christmas trees, maple sap, horticultural, and orchard crops in the State of Vermont.”⁵

However, in both VRG’s pre-filed testimony and its January 23, 2025 response to the Commission’s information request, VRG offers a much broader interpretation of wood derived from agricultural operations. VRG now argues that *any* wood harvested on farms, including trees logged on farm woodlots, qualifies as an agricultural product.

Vermont’s agencies regulating forestry and agriculture do not concur. The Agency of Agriculture, Food and Markets (AAFM) brief of January 27, 2025 states that “AAFM does not consider logging for non-farm purposes to constitute “farming” within the meaning of 10 V.S.A. Section 6001(22).” Meanwhile, the Vermont Department of Forests, Parks and Recreation had already reviewed VRG’s Section 248 application and concluded that it “is sufficient for demonstrating compliance with the Biomass Renewability Energy Standard (Title 30, Chapter 89) and the Department’s rule establishing a Biomass Renewable Energy Standard under 10 V.S.A. §2751.”⁶

On a practical level, even if the Commission were to accept VRG’s argument that timber logged from farmers’ woodlots qualifies as feedstock derived from agriculture, different from timber

⁵ Exhibit VRG-7 INV-ED-1 (VEPP Email Exchange 1 and VRG 2023 Farm Methane Application)

⁶ ANR document submitted October 7, 2024.

logged from forest lands, it is unclear what kind of oversight or tracking system could realistically ensure that the majority of the wood processed at this facility is sourced from farms versus forestry operations. In many cases it would be the same loggers doing the work. Once the wood is chopped down and chipped, verifying the source is virtually impossible.

Additionally, VRG states in its January 23, 2025 brief that it does not propose to use “marketable, high-quality timber” as a feedstock. While arguably these materials would not end up being burned for energy because of their higher market value, compliance with this requirement too would be impossible to verify. Independent investigations have found examples all over the world of biomass companies using wood from different sources than they claim.

(3) Industrial Methane Production

A great deal of attention has been paid in this proceeding to the question of whether the proposed feedstock – in particular, wood harvested from farm woodlots – qualifies as an agricultural product. This is a key part of the investigation into whether the proposed facility qualifies for the Standard Offer farm methane program.

With respect, we believe the Commission should consider another threshold issue related to the facility’s eligibility for this program: whether the proposed project is indeed “using methane derived from an agricultural operation.”⁷ PFPI contends that the proposed facility uses methane produced through an industrial process, not derived from an agricultural operation.

30 VSA Section 248(q)(4) states that “As used in this section, “biogas” means a gas resulting from the action of microorganisms on organic material such as manure or food processing waste.” VRG claims that this provision is only applicable to on-farm plants referenced in Section 248(q)(1)(A).⁸ However, subdivision (q)(4) clearly applies to the *entire* section 248(q).⁹

⁷ 30 VSA Section 248(q)(1).

⁸ VRG Brief, Jan. 23, 2025, p. 10-11.

⁹ Section 248(q)(4) applies to the entire 30 VSA Section 248, but the term “biogas” is only used in subsection (q).

PFPI also questions why VRG's Standard Offer Power Purchase Agreement with VEPP, dated August 28, 2023, describes the facility as a "2,200kW farm methane gas digester plant." The terminology is inaccurate, as a pyrolysis plant is not a methane digester. A methane digester uses microbes to break down organic waste and produce biogas.

The Air Pollution Control Permit issued by the Vermont Agency of Natural Resources (ANR) on June 24, 2024, more accurately states that "the proposed Facility will produce synthetic fuel gas (syngas) from clean wood biomass using a fast High Temperature Ablative Pyrolysis (HTAP) process."¹⁰ VRG states that the syngas created through this process is about 27% methane, by volume.¹¹

PFPI contends that the proposed facility does not qualify as a farm methane project for the following reasons:

(a) The proposed facility would create biogas through a thermochemical process, not through microbial decomposition, as required under 30 VSA Section 248(q)(4).

(b) The proposed feedstocks - even wood wastes from agricultural operations, such as Christmas tree and orchard trimmings - are not a significant source of farm methane.

In other words, the proposed facility is not using methane that is *derived* from farming activities; it is an industrial process that *creates* methane that would not otherwise be generated from farming activities.

Neither Vermont's GHG Emissions Inventory nor Vermont's Climate Action Plan identify trees, living or dead, as a source of methane emissions. According to ANR's website, the main sources of greenhouse gases in Vermont's agriculture sector are "methane (CH₄) emissions from the

¹⁰ Vermont Agency of Natural Resources (ANR), Air Quality & Climate Division, Air Pollution Control Permit to Construct and Operate, issued to Vermont Renewable Gas, LLC for the "Biomass Pyrolysis Producing Syngas And Biochar Syngas Fired Electric Generating Facility" in Lyndon, VT, June 24, 2024.

¹¹ CETY Exhibit, 12/12/24, "VRG HTAP Syngas Composition."

digestive processes of animals and manure management.”¹² Facilities that have traditionally qualified for the farm methane Standard Offer program use methane derived from cow manure.

Both VRG and CETY claim that the HTAP system is more effective at “recovering” methane from wood than anaerobic digesters.¹³ However, dead wood releases carbon dioxide (CO₂) as it decays, not methane, and much of the carbon in wood is incorporated into surrounding soils and vegetation.¹⁴ Living trees, which would be cut down to fuel the plant, sequester and store carbon. While the HTAP process may *produce* more methane from wood than a digester can, this proposed facility will not be *recovering, preventing or reducing* farm methane emissions.

From time to time, PFPI has had to rebut false claims by the biomass industry that logging residues left on the forest floor will biodegrade into methane. This is not true because methane production requires extremely low to zero oxygen (anaerobic) conditions to occur, and these conditions simply are not common at logging sites. Forestry activities primarily take place in upland areas, and there is no evidence that decomposing tree tops and branches from forestry cuttings are a significant source of methane production. In this proceeding, the applicant has made the argument for us, noting that: “According to a wide range of studies on the degradability of lignocellulosic waste – lignin is not metabolized by anaerobic bacteria.”¹⁵

(4) Climate Benefits of Vermont’s Farm Methane Standard Offer Program

Anaerobic digesters are a widely recognized system for mitigating methane emissions from the agriculture sector. Manure from livestock is a significant source of methane and nitrous oxide to the atmosphere - greenhouse gases that are far more potent climate forcers than CO₂. According to Vermont’s Greenhouse Gas Emissions Inventory, emissions from manure management contributed an estimated .35 million metric tons of CO₂ equivalent (MMTCO_{2e}) in 2017, or 25%

¹² ANR, Cutting Carbon Pollution, accessed 2/10/25 at <https://climatechange.vermont.gov/climate-action-office/greenhouse-gas-mitigation>.

¹³ VRG Brief, Page 5; CETY Exhibit, 12/12/24: “Comparison of Conversion Efficiencies”

¹⁴ Mary S. Booth, *Not carbon neutral: Assessing the net emissions impact of residues burned for bioenergy*. Environmental Research Letters, Feb. 21, 2018, at <https://iopscience.iop.org/article/10.1088/1748-9326/aaac88>

¹⁵ CETY Exhibit, 12/12/24: “Wood Wastes and Anaerobic Digestion”

of Vermont's agriculture sector emissions.¹⁶ Vermont's GHG inventory does not include methane captured through anaerobic digestors in this estimate.¹⁷

The top climate mitigation strategy for agriculture in Vermont's Climate Action Plan is:

1. "Prevention of emissions to the atmosphere by conserving existing carbon pools in soils and vegetation or by reducing emissions of methane (CH₄) and nitrous oxide (N₂O) through management changes."¹⁸

Because of its significance as a source of methane emissions, the Climate Action Plan identified two recommended actions related to manure management:

(h) "Implement methane capture and energy generation on farms, e.g. anaerobic digesters and covers," and

(i) "Research and pilot improved manure management and storage programs."¹⁹

As DPS notes in its January 23, 2025 brief, while the Standard Offer program was designed to help achieve Vermont's renewable energy goals, the farm methane category offers unique incentives. Unlike the other categories, farm methane projects are not subject to the cumulative capacity cap. In addition, farm methane projects may retain the renewable energy credits (RECs) they generate.²⁰

There are numerous reasons why the farm methane category may offer greater incentives than other Standard Offer programs. As the DPS observes, these include "a desire to promote farm-

¹⁶ ANR Dept. of Environmental Conservation, Air Quality and Climate Division. "Vermont Greenhouse Gas Emissions Inventory and Forecast: 1990-2017." May 2021, p. 21.

https://dec.vermont.gov/sites/dec/files/aqc/climate-change/documents/Vermont_Greenhouse_Gas_Emissions_Inventory_Update_1990-2017_Final.pdf

¹⁷ Ibid., p. 22.

¹⁸ Vermont Climate Council, Initial Vermont Climate Action Plan, December 2021, p, 109.

<https://climatechange.vermont.gov/sites/climatecouncilsandbox/files/2021-12/Initial%20Climate%20Action%20Plan%20-%20Final%20-%202012-1-21.pdf>

¹⁹ Ibid, p. 123-125.

²⁰ Brief of the Vermont DPS, 1/12/25, p. 10.

based energy and benefit working farms.”²¹ Other benefits identified in the Climate Action Plan include mitigation of greenhouse gas emissions, reduction of nutrients transported to surface water, and increased soil fertility.²² Methane capture and energy generation projects also have high initial capital costs, a barrier for farm participation.²³ Arguably, the diverse benefits of farm methane digesters, both for supporting Vermont’s agricultural economy and for Vermonters as a whole, justify the greater expense for ratepayers.

The proposed HTAP process does not offer these additional benefits. Not only does it fail to reduce farm methane emissions, but it also goes against the Climate Action Plan’s strategy to prevent agricultural emissions to the atmosphere “by conserving existing carbon pools in soils and vegetation.”²⁴ The most effective and efficient way of conserving carbon pools in soils and vegetation is to allow trees to continue to grow and to leave wood wastes to decay on site. Instead, this proposed facility would burn them to produce biochar. While biochar production is outside the scope of this investigation, we endorse the comments submitted January 23, 2025 by Dr. Rachel Smolker of Biofuelwatch.

(5) Air Pollution Concerns

We appreciate the Commission’s request for further information about the HTAP facility’s operations, including how the process differs from combustion. Although CETY claims that it has used the HTAP process in Europe, we have no information about the location of these facilities, what their feedstock source is, or what their emissions have been. We concur with Biofuelwatch’s recommendation that the PUC require reference facility information.

As we noted in our comments on VRG’s 248(j) petition, PFPI is very concerned about the harmful air pollution from the facility. According to its Air Pollution Control Permit from ANR, VRG’s proposed facility will emit more than 2.5 tons per year of hazardous air pollutants (HAPs), mostly formaldehyde, which EPA lists as a “known human carcinogen.” Other HAPs

²¹ Brief of the Vermont DPS, 1/12/25, pp.11-12.

²² Climate Action Plan, p. 124.

²³ *Ibid.*

²⁴ *Ibid.*, p. 109.

emitted include 1-3 butadiene, another known human carcinogen, and acetaldehyde, which EPA considers a “probable” human carcinogen. Even with pollution control equipment, ANR acknowledged that the facility could still exceed the Action Levels for these hazardous emissions.²⁵ Thus even if this experimental technology operated as designed, air pollution from the facility could pose a serious health risk to the surrounding community.

Conclusion

In conclusion, we commend the Commission for ordering this investigation. For the aforementioned reasons, we believe that VRG’s proposed wood-burning pyrolysis facility in Lyndon, Vermont unequivocally does not qualify for the Standard Offer as a “farm methane” plant. PFPI would be happy to provide additional information upon request.

Thank you for this opportunity to comment.

Respectfully submitted,

A handwritten signature in cursive script that reads "Laura Haight".

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²⁵ ANR’s operating permit requires the facility to install a catalytic reduction system to achieve Vermont’s “Hazardous Most Stringent Emission Rate” (HMSER). Nevertheless, according to the permit, “the Agency has determined that the Facility, following imposition of HMSER as noted above, may continue to have estimated emissions of 1,3-butadiene (106-99-0), acetaldehyde (75-07-0) and formaldehyde (50-00-0) in excess of their respective Action Level.”