

**STATE OF VERMONT
PUBLIC UTILITIES COMMISSION**

Case No. 24-3359-INV

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

**TESTIMONY OF
EVAN DELL'OLIO
ON BEHALF OF**

VERMONT RENEWABLE GAS, LLC

Mr. Dell'Olio's testimony addresses the first question in the Information Request directed to Vermont Renewable Gas, LLC in the Vermont Public Utility Commission's November 7, 2024 Order Requiring Full 30 V.S.A. § 248 Procedure, Staying Case No. 24-2797-PET, Opening An Investigation of the Standard-Offer Contract and Requesting Information and Briefing (Case No. 24-2797-PET and Case No. 24-3359-INV).

EXHIBIT LIST

Ex. VRG-INV-ED-0: Biography

Ex. VRG-INV-ED-1: VEPP Email Exchange 1 and VRG 2023 Farm Methane Application

Ex. VRG-INV-ED-2: VEPP Email Exchange 2 and VRG HTAP Process Description

Ex. VRG-INV-ED-3: VEPP Email Exchange 3 and VEPP Qualification Document

Ex. VRG-INV-ED-4: VEPP Email Exchange 4 and Standard Offer Acceptance Letter

1 **Q1: Please state your name and position relative to this Petition.**

2 A1: My name is Evan Dell'Olio. I am a Manager of Vermont Renewable Gas, LLC, ("VRG")
3 a Vermont limited liability company with its principal place of business at 145 Pine
4 Haven Shores Road #1000A Shelburne, Vermont 05482. VRG intends to construct and
5 operate a farm methane facility ("the Project") in the Saint Johnsbury – Lyndon Industrial
6 Park in Lyndon, Vermont. A petition for a certificate of public good for the Project has
7 been filed in in Case No. 24-2797-PET. The owners of VRG are my company Synergy
8 Bioproducts Corporation (Synergy Bioproducts), a Vermont corporation with its principal
9 place of business also at 145 Pine Haven Shores Road #1000A Shelburne, Vermont
10 05482 and CETY Capital, LLC (CETY Capital), a wholly owned subsidiary of Clean
11 Energy Technologies, Inc. (CETY), a Nevada Corporation with its principal place of
12 business at 1340 Reynolds Ave. #120 Irvine, California 92614. I am the founder and
13 principal shareholder of Synergy Bioproducts Corporation.

14

15 **Q2: Please describe your qualifications and experience.**

16 A2: I earned a Bachelor of Arts Degree from Saint Anselm College in Manchester, New
17 Hampshire as well as a degree of Juris Doctor from Suffolk University in Boston,
18 Massachusetts. In the beginning of my career, I worked for United States Senator John F.
19 Kerry of Massachusetts. Since that time, I have primarily spent my career in the clean
20 energy and renewable natural resources sectors. My biography is attached as Exhibit
21 VRG-INV-ED-0. In 2023 my company Synergy Bioproducts formed VRG as a joint

1 venture with CETY's CETY Capital subsidiary to develop a farm methane project. We
2 have chosen to develop, construct, and operate this project in Lyndon, Vermont. VRG and
3 CETY subsequently entered into an Engineering, Procurement, and Construction (EPC)
4 Agreement for CETY to permit, design, construct, and commission the Project. The intent
5 is for this Project to support Vermont's long-term renewable energy and climate goals,
6 build upon the state's working lands economy, and support environmental stewardship in
7 Vermont. This project is similar to other projects CETY and its partners have developed
8 in Europe to generate heat and/or electricity.

9
10 **Q3: What is the purpose of your testimony?**

11 A3: My testimony responds to the Commission's Request for Information in its Order dated
12 November 7, 2024 in this matter, and directly answers Information Request 1.

13
14 **Q4: Please describe the Vermont Renewable Gas – Lyndon proposed facility.**

15 A4: Vermont Renewable Gas – Lyndon is a combined electric generation and biochar carbon
16 removal facility. This facility will use Clean Energy Technologies' High Temperature
17 Ablative Pyrolysis (HTAP) system to produce high-carbon biochar and recovered
18 volatiles in the form of a synthetic fuel gas, including methane. The facility will
19 accomplish this process by heating woody biomass (51% or more of such biomass
20 sourced from farming operations in Vermont) in an anaerobic environment. The synthetic

1 fuel gas produced by this process will be combusted in three onsite synchronous internal
2 combustion engines to drive electric generators.

3

4 **Q5: What is a carbon removal facility and is Vermont Renewable Gas – Lyndon this**
5 **classification of facility while simultaneously being an electric generation project?**

6 A5: A carbon removal project is an initiative designed to actively remove carbon dioxide
7 (CO₂) from the atmosphere and store it in a stable form, helping to counterbalance
8 emissions and mitigate climate change. Unlike carbon reduction or avoidance projects,
9 which focus on preventing CO₂ emissions (e.g. switching to renewable energy), carbon
10 removal projects focus on extracting existing CO₂ from the air.¹ Engineered nature-based
11 solutions such as biochar production are one common method for achieving this
12 initiative.² In a facility like Vermont Renewable Gas – Lyndon, biomass is converted into
13 a stable form of carbon (biochar) that can be buried in soil to improve fertility and lock
14 away carbon for hundreds to thousands of years.³ For this reason, it has been referred to
15 by some proponents as “reverse coal mining.” The Intergovernmental Panel on Climate
16 Change (IPCC) has recognized carbon removal as an essential strategy for mitigating
17 climate change, particularly for achieving net-zero emissions and addressing residual

¹ American University, Explainer: Carbon Removal: <https://www.american.edu/sis/centers/carbon-removal/explaining-carbon-removal.cfm>

² World Economic Forum, Biochar is carbon removal's jack of all trades. Here's why, Nov. 23, 2023: <https://www.weforum.org/stories/2023/11/biochar-carbon-removals-jack-of-all-trades-for-immediate-climate-action/>

³ Rediscovering the Ancient Wisdom of Biochar, UC Berkeley: <https://berc.berkeley.edu/news/rediscovering-ancient-wisdom-biochar>

1 emissions in hard-to-abate sectors like agriculture and aviation that cannot be eliminated
2 through conventional mitigation efforts.⁴ Carbon removal projects play a critical role in
3 global climate strategies, complementing emission reduction efforts to limit global
4 warming to 1.5 degrees C or even lower above pre-industrial levels as outlined in the
5 Paris Agreement.⁵ To date, European organizations have largely played a pioneering role
6 in formalizing and advancing carbon removal initiatives.⁶ A motivating factor has been
7 the extreme unlikelihood to limit global warming to 1.5 degrees C above pre-industrial
8 levels without scaling carbon removal solutions. While scaling carbon removal facilities
9 is necessary, it has proven to be a major challenge. Other technology choices such as
10 direct air capture currently constitute about 0.1% of the necessary removal capacity to
11 reach the aforementioned goals due to high costs of adoption. Significant investments and
12 governmental policy support are needed to scale these methods by orders of magnitude
13 by 2050.⁷ Biochar carbon removal is a readily available option that is already highly
14 feasible, particularly when partnered with existing governmental policies such as
15 Vermont's Farm Methane Standard Offer. Therefore, while not yet common in the United

⁴ IPCC, Carbon Dioxide Removal Technologies and Carbon Capture Utilization and Storage 1-3 July 2024:
https://www.ipcc-nggip.iges.or.jp/public/mtdocs/pdffiles/2407_Background_CDR_CCUS.pdf

⁵ IPCC Factsheet: Carbon Dioxide Removal:
https://www.ipcc.ch/report/ar6/wg3/downloads/outreach/IPCC_AR6_WGIII_Factsheet_CDR.pdf

⁶ Chiamonti, D., Lehmann, J., Berruti, F. *et al.* Biochar is a long-lived form of carbon removal, making evidence-based CDR projects possible. *Biochar* 6, 81 (2024). <https://doi.org/10.1007/s42773-024-00366-7>
<https://link.springer.com/article/10.1007/s42773-024-00366-7>

⁷ World Resources Institute: Carbon Removal: <https://www.wri.org/initiatives/carbon-removal>

1 States, the construction of a facility like Vermont Renewable Gas – Lyndon would offer
2 demonstratable results for climate action not yet realized in Vermont.

3
4 **Q6: How does a facility typically become qualified as a “carbon removal facility”?**

5 A6: Typically, a facility interested in qualifying as a carbon removal facility by meeting
6 specific criteria that qualify its activities as removing CO2 from the atmosphere and
7 ensuring its storage is verifiable, measurable, and durable. For most commercial biochar
8 carbon removal facilities, this pathway includes qualifying for a form of carbon removal
9 certificates, a type of environmental attribute which represents the claim to carbon
10 removal for the purchaser.⁸ There are multiple internationally recognized standards for
11 achieving this qualification. Biochar carbon removal accounted for 94% of the carbon
12 dioxide removal market in 2023, making it one of the most prominent methods of carbon
13 removal available today. For early adopters, interest in developing facilities stems from
14 the long-term stability of carbon sequestered in biochar and its additional benefits such as
15 improving soil quality and aiding agricultural productivity, among other benefits.
16 European organizations have played a pioneering role in formalizing and advancing
17 biochar carbon removal initiatives across the agricultural landscape. Vermont Renewable
18 Gas – Lyndon has begun the process of qualifying its facility as a carbon removal facility.

⁸ See, e.g., Puro Standard Biochar Methodology, Edition 2022 V3, Feb. 1, 2024:
<https://7518557.fs1.hubspotusercontent-na1.net/hubfs/7518557/Supplier%20Documents/Puro.earth%20Biochar%20Methodology.pdf>

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Q7: If Vermont Renewable Gas – Lyndon is a carbon removal facility, why is it simultaneously classified as a proposed distributed electric generation facility?

A7: Biochar carbon removal facilities are also often electric generation facilities because the process to produce biochar (pyrolysis) generates both biochar and energy-rich synthetic fuel gas. For facilities like Vermont Renewable Gas – Lyndon, capturing the volatiles produced during biochar production is a critical factor in determining whether a facility qualifies as a carbon removal facility under most carbon removal qualification standards.⁹ As explained in more detail in Alexander Skorokhodov’s Prefiled Testimony, during the process of pyrolysis volatile organic compounds (VOCs), methane, hydrogen, and carbon monoxide are released. If these volatiles are not captured and are instead vented into the atmosphere, they can contribute significantly to greenhouse gas (GHG) emissions, particularly methane which has a much higher global warming potential than CO₂. Carbon removal standards therefore require that carbon removal facilities capture or neutralize pyrolysis gases to minimize GHG emissions. Failing to capture volatiles can disqualify a facility or significantly reduce its carbon removal potential. Methane’s global warming potential over 100 years is 28 – 36 times that of CO₂, making its capture or destruction essential.¹⁰ Therefore, instead of venting volatiles, many biochar carbon

⁹ See, e.g., Puro Standard Biochar Methodology, Edition 2022 V3, Feb. 1, 2024: <https://7518557.fs1.hubspotusercontent-na1.net/hubfs/7518557/Supplier%20Documents/Puro.earth%20Biochar%20Methodology.pdf>
¹⁰ International Energy Agency, Methane and Climate Change: <https://www.iea.org/reports/methane-tracker-2021/methane-and-climate-change#>

1 removal facilities capture and combust them to generate heat and electricity. Combusting
2 methane and other hydrocarbons converts them into CO2 and water, significantly
3 lowering their global warming potential. This process also improves net carbon removal
4 by reducing the use of fossil fuels on the electric grid, developing co-benefits.

5

6 **Q8: What is the range of benefits that the use of biochar can accomplish in Vermont?**

7 A8: Biochar use in Vermont can offer a wide range of environmental, agricultural, and
8 economic benefits in Vermont. The state's unique agricultural context, coupled with its
9 climate goals, makes biochar a particularly effective tool for achieving multiple
10 objectives. First, biochar offers solutions for carbon removal and climate mitigation. As
11 mentioned above, biochar locks carbon in stable form, preventing it from re-entering the
12 atmosphere. This contributes to Vermont's greenhouse gas reduction targets. Likewise,
13 incorporating biochar into soils can lower emissions of potent greenhouse gases like
14 methane and nitrous oxide from agricultural fields.¹¹ Second, biochar can improve soil
15 health. Biochar improves soil structure, water retention, and nutrient availability which is
16 particularly valuable in Vermont's flood-prone agricultural regions.¹² It can also reduce
17 soil acidity and bind to pollutants, making contaminated lands more productive. Such

¹¹ Rittl TF, Oliveira DMS, Canisares LP, Sagrilo E, Butterbach-Bahl K, Dannenmann M and Cerri CEP (2021) High Application Rates of Biochar to Mitigate N₂O Emissions From a N-Fertilized Tropical Soil Under Warming Conditions. *Front. Environ. Sci.* 8:611873. doi: 10.3389/fenvs.2020.611873 :

<https://www.frontiersin.org/journals/environmental-science/articles/10.3389/fenvs.2020.611873/full>

¹² Biochar Use in Stormwater Management: https://biochar-us.org/sites/default/files/presentations/1644940451_Biochar-Use-In-Stormwater-Management_USBI_IBI_Dovetail.pdf

1 contaminants include heavy metals and per – and polyfluoralkyl (PFAS).¹³ Third, water
2 quality protection is addressed. Biochar can trap nitrogen and phosphorous in the soil,
3 preventing runoff into waterways, which aligns with ongoing efforts to protect Vermont's
4 lakes, ponds, streams, and rivers.¹⁴ This helps to prevent against algae blooms and a loss
5 of biodiversity in Vermont's aquatic areas, and reduces the loss of economic benefits
6 from fishing and tourism. Furthermore, by increasing water infiltration and retention in
7 soils, biochar helps manage stormwater, reducing flood risks in Vermont's agricultural
8 landscapes and bordering areas. A fourth benefit is biochar's ability to support and sustain
9 local agriculture. Vermont farmers can benefit from biochar's ability to improve soil
10 productivity, particularly in areas with marginal or degraded soils. This ultimately may
11 increase crop yields and farm productivity.¹⁵ Biochar aligns well with Vermont's strong
12 organic farming sector, as it is a sustainable, chemical-free soil amendment. Additionally,
13 biochar can be added to the top layer of manure pits on dairy farms, increasing microbial
14 activity by creating a permeable cover. This accelerates the manure decomposition

¹³ Erlend Sørmo, Ludovica Silvani, Nora Bjerkli, Nikolas Hagemann, Andrew R. Zimmerman, Sarah E. Hale, Caroline B. Hansen, Thomas Hartnik, Gerard Cornelissen, Stabilization of PFAS-contaminated soil with activated biochar, *Science of The Total Environment*, Volume 763, 2021:

<https://www.sciencedirect.com/science/article/pii/S0048969720375653#:~:text=Biochars%20are%20considered%20potential%20sustainable,of%20activation%20and%20activation%20temperature>.

¹⁴ Wu, X.; Quan, W.; Chen, Q.; Gong, W.; Wang, A. Efficient Adsorption of Nitrogen and Phosphorus in Wastewater by Biochar. *Molecules* **2024**, *29*, 1005. <https://doi.org/10.3390/molecules29051005> <https://www.mdpi.com/1420-3049/29/5/1005#:~:text=Biochar%20has%20a%20high%20specific,achieving%20the%20reusability%20of%20elements>.

¹⁵ U.S. Department of Agriculture, Climate Hubs, Digging into Biochar:

<https://www.climatehubs.usda.gov/hubs/northeast/topic/digging-biochar#:~:text=Biochar's%20ability%20to%20increase%20water,which%20all%20enhance%20crop%20yield>.

1 process while reducing odors.¹⁶ A fifth benefit is the attention to waste management.
2 Vermont's farms and the farm woodlots within them produce significant biomass waste,
3 which can be converted into biochar rather than being left to decompose or be burned. A
4 sixth benefit is the impact on rural economic opportunity. Establishing biochar
5 production, particularly in a location within Vermont's Northeast Kingdom provides
6 economic development opportunities. Technical production jobs and jobs associated with
7 the collection and processing of biomass as well as the distribution and application of
8 biochar support rural economies. Lastly, ecosystem resilience is enriched. Healthier soils
9 and cleaner water lead to more robust ecosystems, benefiting Vermont's native flora and
10 fauna. Improved soil water retention allows for climate adaptation as well, helping crops
11 and forests withstand drought and other climate stresses. Altogether, biochar offers
12 Vermont a multi-faceted tool to address climate change, enhance agricultural
13 productivity, protect water quality, and create economic opportunities. Its application
14 aligns with the state's commitment to sustainability and rural resilience.

15
16 **Q9: Please describe the process of Vermont Renewable Gas, LLC obtaining a Farm**
17 **Methane Standard Offer Contract.**

18 A9: Vermont Renewable Gas, LLC (VRG) applied for a Standard Offer Contract under
19 Vermont's Farm Methane section through the Standard Offer Facilitator (VEPP) in July

¹⁶ Agproud, How biochar can be used as a manure storage cover: <https://www.agproud.com/articles/58379-how-biochar-can-be-used-as-a-manure-storage-cover>

1 of 2023. VRG sought qualification as a Farm Methane facility due to the project being a
2 renewable electricity facility which utilizes methane derived from agricultural feedstocks.
3 VRG filled out a Farm Methane application according to its instructions. VRG explained
4 that the Facility would rely at least 51% on feedstock from agricultural operations, and
5 that such feedstock will come in the form of wastes and products derived from
6 agricultural operations engaged in the cultivation or other use of land for growing fiber,
7 Christmas trees, maple sap, horticultural, and orchard crops. Please see **Exhibit VRG-**
8 **INV-ED-1 (VEPP Email Exchange 1 and VRG 2023 Farm Methane Application)**.

9
10 **Q10: What follow-up steps did the Standard Offer Facilitator take to review VRG's Farm**
11 **Methane Application?**

12 A10: Following our submission of a farm methane application, we received an email from
13 VEPP explaining that our application had been reviewed, and VEPP requested a project
14 description that detailed the process we would use to generate methane. We provided a
15 detailed document demonstrating that the project would rely on High Temperature
16 Ablative Pyrolysis (HTAP), using thermochemical decomposition of organic matter
17 (rather than bacteria). Please see **Exhibit VRG-INV-ED-2 (VEPP Email Exchange 2**
18 **and VRG HTAP Process Description)**. Following this exchange, we received
19 correspondence from VEPP noting that because our intended feedstock was listed as
20 "...fiber, Christmas trees, maple sap, horticultural, and orchard crops," and because farm
21 methane plants typically use cow manure as their primary feedstock, VEPP needed to

1 ensure that VRG – Lyndon does not belong in the biomass or food waste categories.

2 VEPP further noted that neither biomass nor food waste were eligible for Standard Offer
3 Contracts at that time. VEPP asked us to identify how Christmas trees, maple sap, and
4 orchard crops are not biomass or food waste feedstock, and on July 31, 2023 we sent a
5 response. Please see **Exhibit VRG-INV-ED-3 (VEPP Email Exchange 3 and VEPP**
6 **Qualification Document)**. On August 8, 2023 we received correspondence from VEPP
7 including a program acceptance letter welcoming us as a Farm Methane generator within
8 Vermont's Standard Offer program. Please see **Exhibit VRG-INV-ED-4 (VEPP Email**
9 **Exchange 4 and Standard Offer Acceptance Letter)**. After the stipulations in this
10 acceptance letter were achieved, the parties executed a Farm Methane Standard Offer
11 Contract on August 28, 2023.

12
13 **Q11: Please describe why VRG selected Lyndon, Vermont as an ideal location for its**
14 **facility?**

15 A11: Lyndon and neighboring Sant Johnsbury serve as gateway communities to Vermont's
16 Northeast Kingdom. The rural Northeast Kingdom is an ideal location for a pyrolysis
17 plant utilizing woody agricultural feedstocks due its abundant natural resources and
18 strong alignment with the region's economic and environmental priorities. This is
19 evidenced in the NVDA's Northeast Kingdom Regional Plan, which calls for farming and

1 agriculture to remain an important and viable sector of the regional economy.¹⁷
2 Additionally, the Regional Plan recommends supporting education efforts that teach
3 sustainable agricultural practices as well as encouraging and supporting agricultural
4 production of biofuels.¹⁸ The VRG plant fits both of these categories. Moreover, the
5 Regional Plan encourages the development of energy facilities and resources that help
6 sustain local agriculture and forestry. Converting underutilized lignocellulosic biomass
7 into a steady and reliable stream of feedstock for the co-production of energy and biochar
8 provides both economic and environmental benefits to farmers in the Northeast Kingdom.
9 The region's rural economy, heavily reliant on agriculture and forestry, benefit from new
10 markets for these materials, creating economic opportunities while attaining climate
11 action. The plant's ability to generate renewable electricity and produce biochar – a
12 valuable soil amendment that enhances crop yields and sequesters carbon – supports
13 Vermont's longstanding leadership in combating climate change and promoting
14 sustainable farm management practices. Strategically located in a region with a strong
15 commitment to environmental stewardship, the facility also strengthens local energy
16 independence and rural resilience, making Lyndon and the Northeast Kingdom an
17 optimal location for such an innovative facility. In addition to all of these factors, Lyndon
18 is one of the commercial centers within this agriculturally-focused region. The industrial

¹⁷ Regional Plan for the Northeast Kingdom, 2015-2023, amended (new Regional Energy Plan added) April 26, 2018:
<https://www.nvda.net/nvda-regional-plan/2018Volumel.Final.pdf>

¹⁸ Regional Plan for the Northeast Kingdom, 2015-2023, amended (new Regional Energy Plan added) April 26, 2018:
<https://www.nvda.net/nvda-regional-plan/2018Volumel.Final.pdf>

1 park affords access to appropriate small industrial siting needs such as access to major
2 highways, three-phase electricity, sewage access, potable water access, and internet
3 service. Additionally, the centralized location is ideal for developing a strong workforce
4 as Lyndon is a labor center within the region. Facility employees can access a local bus
5 service as well as childcare within the industrial park. These factors meet important
6 human needs when access to reliable transportation and childcare are challenges in the
7 Northeast Kingdom region.

8
9 **Q12: Please describe the integration of farm woodlots as part of a complete agricultural**
10 **system on farms in Vermont.**

11 A12: A farm woodlot is any part of a farm that is dedicated to woodlands. A farm woodlot is
12 an essential component of an integrated agricultural system, serving multiple ecological,
13 economic, and agricultural functions and functions that contribute to the sustainability
14 and productivity of the farm. Currently, it is estimated that 42% of Vermont's farm
15 acreage is woodland.¹⁹ The existence of these approximately 2 million acres demonstrate
16 the sizeable portion of Vermont's farms dedicated to the growing and harvesting of timber
17 as a fiber crop and the other ecosystem services provided by such farm woodlots. A
18 significant threat to the continued viability of these woodlands as a portion of Vermont's

¹⁹ Egan, A. F. "Farm Woodlots in Northern New England, USA: Characteristics, Management, and Contributions to the Whole Farm System." *Renewable Agriculture and Food Systems*, vol. 22, no. 1, 2007, pp. 67–73. *JSTOR*, <http://www.jstor.org/stable/44491431>. Accessed 10 Dec. 2024. <https://www.jstor.org/stable/44491431>

1 farms is the loss of Vermont's farmlands to residential and commercial development. In
2 fact nearly 20,000 acres of such farmlands has been lost since 2017.²⁰ In New York State,
3 an initiative by the New York Farm Viability Institute at Cornell University has
4 recognized the economic challenges faced by farmers, particularly dairy farmers in
5 maintaining the economic viability of their farms. This initiative was therefore created to
6 assist farmers with creating strategies to increase income yields from their farm woodlots,
7 including from timber production and sale.²¹

8 The farm woodlot is a vital part of farms in Vermont, providing the following
9 benefits: (1) Diversified income stream. Woodlots provide an additional source of
10 revenue for farmers through saw timber, pulpwood, firewood, biomass chips, and non-
11 timber forest products like maple sap, nuts, mushrooms, or medicinal plants. This
12 diversification can reduce financial risks (as recognized by the aforementioned Cornell
13 program) and offer stability in times of crop or livestock market fluctuations; (2) Soil
14 health and erosion control. The trees in woodlots contribute organic matter to the soil
15 through leaf litter, enhancing soil structure and fertility over time.²² Tree roots help
16 stabilize the soil, reducing erosion and protecting the farm's agricultural fields from soil
17 loss, particularly on sloped or erosion-prone lands; (3) Water management benefits. Farm

²⁰ Vermont Agency of Agriculture, Food, and Markets, Census of Agriculture Captures Changes:
[https://agriculture.vermont.gov/census-agriculture-captures-changes-vermont-agriculture-#:~:text=Vermont has 6,537 farms, down,a drop of 37 percent.](https://agriculture.vermont.gov/census-agriculture-captures-changes-vermont-agriculture-#:~:text=Vermont%20has%206,537%20farms,%20down,a%20drop%20of%2037%20percent.)

²¹ Cornell College of Agricultural and Life Sciences, How About Those Woodlots; Can We Make Any Money From Them? <https://smallfarms.cornell.edu/2019/01/how-about-those-woodlots-can-we-make-any-money-from-them/>

²² USDA, Maintaining and improving forest soil quality <https://www.nrcs.usda.gov/sites/default/files/2022-09/E666A%20-%20Maintaining%20and%20improving%20forest%20soil%20quality.pdf>

1 woodlots play a role in regulating water quality. They act as natural filters, capturing and
2 clarifying runoff, reducing nutrient leaching, and help maintain cleaner water sources for
3 farm livestock and crop irrigation;²³ (4) Biodiversity and pest control. Farm woodlots
4 offer habitat for a variety of beneficial organisms, including pollinators, birds, and
5 predatory insects, which contribute to natural pest control in surrounding farm fields.²⁴
6 This diversity supports a balanced ecosystem and can reduce reliance on chemical inputs
7 for crop production: (5) Carbon sequestration. Farm woodlots mitigate the effects of
8 climate change. Farm woodlots provide shade and shelter for livestock and crops,
9 reducing stress during extreme weather and enhancing resilience to climate variability;²⁵
10 and (6) Source of energy. Farm woodlots provide an important fuel and energy source for
11 farmers. Lower value wood harvested from a farm woodlot can be used as a renewable
12 source of energy, providing heating fuel for the farm. As presented in the matter at hand,
13 these farm woodlots can also provide material that can be used for co-production of
14 biochar and energy if the technology is available on the farm or at a community-scale
15 facility like the VRG Project.²⁶ This use of farm woodlots helps to achieve energy

²³ USDA, US Department of Agriculture, How Agroforestry Practices Improve Water Quality

<https://www.fs.usda.gov/nac/topics/water-quality.php>

²⁴ Food & Environment Reporting Network, This farm relies on birds — not pesticides — to control pests

<https://thefern.org/2021/07/this-farm-relies-on-birds-not-pesticides-to-control-pests/>

²⁵ USDA Agroforestry Strategic Framework: Fiscal Year 2019-2024:

<https://www.usda.gov/topics/forestry/agroforestry#:~:text=Silvopasture%20combines%20trees%20with%20livestock,winter%20winds%2C%20or%20a%20downpour.>

²⁶ Agricultural Marketing Resource Center; Forest Residue

<https://www.agmrc.org/commodities-products/renewable-energy/forest-residue>

1 independence and numerous community benefits including energy independence and
2 rural resiliency.

3 By incorporating a woodlot into their farm system, farmers create a self-
4 sustaining, resilient landscape that supports agricultural productivity, environmental
5 health, and economic stability for the farmer and their community. This is already
6 evidenced across the significant portion of the Vermont farm landscape utilized as farm
7 woodlots. The farm woodlots' multifunctional role helps to integrate and balance the
8 needs of farming and conservation, making it a valuable asset within the broader
9 agricultural ecosystem.

10
11 **Q13: Please respond to Information Request 1, which states: "Page 2 of exhibit VRG-EK-**
12 **1 states that the majority (at least 51%) of the biomass feedstock used at the Facility**
13 **will come from sources consistent with the definition of farming, including**
14 **operations engaged in the cultivation of fiber, Christmas trees, maple sap, and**
15 **horticultural and orchard crops. The exhibit further states that most of the material**
16 **will be sourced from logging residues generated from the harvesting of trees as fiber**
17 **for higher-value uses (e.g. sawlogs, pulpwood) and the management of woodlands**
18 **for maple sap production. Please provide more information on the feedstock**
19 **referred to as "land for growing fiber," including what type of trees or other**
20 **resources are grown on this land and what percentage of the feedstock will be from**

1 **this land. Please describe how the harvesting of trees as fiber is consistent with the**
2 **definition of “farming” contained in V.S.A. § 6001(22).”**

3 A13: Trees and byproducts of their harvest from a farm woodlot come from land “growing
4 fiber.” This terminology emphasizes the woodlot’s role in producing fiber-rich resources
5 that can be utilized across various agricultural and industrial processes.²⁷

6 In farming, “fiber” refers to any renewable biological material that can be grown
7 and harvested on a farm for manufacturing, energy production, or other economic
8 purposes.²⁸ In the context of a farm woodlot as discussed throughout this testimony, trees
9 and woody plants are cultivated for their biomass, which contains cellulose and lignin –
10 key fibrous components.

11 In Vermont, V.S.A. § 6001(22) describes the “growing of fiber” as farming. The
12 cultivation of trees and their byproducts for durable wood, energy, or pulp production on
13 a farm is recognized as an agricultural activity, since it produces a renewable resource
14 that can be harvested, processed, and sold continually on a farm.²⁹ The following answers
15 numbered 14 through 16 provide additional responsive information to this question.

16

17 **Q14: Please describe the feedstock to be utilized by the Facility to meet the Farm**
18 **Methane expectation of at least 51% Farm Derived.**

²⁷ USDA, US Department of Agriculture, Fiber Resources: <https://research.fs.usda.gov/treesearch/7106>

²⁸ National Center for Appropriate Technology, Fiber: <https://attra.ncat.org/topics/fiber/>

²⁹ A Farmer’s Guide to Woodlands Management, 10TIPS FOR WOODLOT PROFITS AND ENJOYMENT
https://www.iatp.org/sites/default/files/181_2_78314.pdf

1 A14: VRG will source at least 51% of its feedstock material from wood fiber (lignocellulosic
2 biomass) from the following sources: 1) wood fiber and wood fiber byproducts from
3 Christmas tree, maple sap, horticultural, and orchard crop production, 2) wood fiber from
4 timber grown and harvested as short-rotation tree crops grown for energy production, 3)
5 wood fiber from timber purposefully harvested from woodlots on farms and grown for
6 energy production, and 4) wood fiber byproducts from timber grown and harvested from
7 woodlots on farms. Of the 51% of feedstock material falling within these categories, it is
8 estimated that over the project's 20-year lifetime approximately 30% will be sourced
9 from category 1 while 70% will be sourced from categories 2 through 4 (the sections
10 constituting fiber or byproducts associated with fiber production). VRG may need to
11 adjust these percentages within the confines of agriculture based on changing weather
12 and market conditions over the plant's 20-year lifetime.

13

14 **Q15: Please describe the types of fiber and wood fiber byproducts associated with**
15 **Christmas tree, maple sap, horticultural, and orchard crop production:**

16 A15: Wood fiber and wood fiber byproducts associated with Christmas tree production
17 includes Christmas trees and parts of Christmas trees not suitable for sale by a farmer.
18 Wood fiber and wood fiber byproducts associated with maple sap production includes
19 trees and parts of trees trimmed in the management of a maple sugarbush. Wood fiber and
20 wood fiber byproducts associated with horticultural crop production include parts of
21 horticultural plants or trees that are trimmed in the growing of such crops or rejected

1 crops of that type not suitable for sale. Wood fiber and wood fiber byproducts of orchard
2 crops include orchard trees and parts of orchard trees pruned, trimmed, or cut as part of
3 regular management of an orchard.

4

5 **Q16: What types of trees and other vegetation is consistent with the growing of fiber**
6 **production in farming?**

7 A16: Certain types of trees and vegetation are commonly grown on farms, including within
8 their woodlots for their high fiber content, compatibility with sustainable land
9 management practices, and suitability for lumber, pulpwood, firewood, and biomass
10 production. These include fast-growing tree crops such as poplars and willows. Poplars
11 grow quickly, and their wood is ideal for both biomass energy and pulp production.³⁰
12 Willow, particularly varieties of shrub willow are often used in shorter rotation coppice
13 systems due to its rapid regrowth, making it ideal for frequent harvesting for industrial
14 uses as well as biomass feedstock. Shrub willow grow particularly well on underutilized
15 and marginal agricultural lands.³¹ This species can also be incorporated into existing
16 fields to create windbreaks and integrated into agroforestry applications supporting alley
17 cropping and environmental quality.³² Other hardwoods grown on farms for fiber include

³⁰ Simulating Biomass Production and Water Use of Poplars in a Plantation Using a STELLA-Based Model;
https://www.srs.fs.usda.gov/pubs/ja/2022/ja_2022_amatya_001.pdf

³¹ SUNY ESF, "Willow/Woody Biomass"; <https://www.esf.edu/willow/index.php>

³² Alley Cropping: An Agroforestry Practice:
<https://www.fs.usda.gov/nac/assets/documents/agroforestrynotes/an12ac01.pdf>

1 maple, beech, birch, ash, and other native species within the farms' woodlots.³³ While
2 slower-growing, these hardwoods produce dense fiber that can be used in various on-farm
3 and commercial uses. On-farm uses may include raw material for the sawing of flooring
4 for a new barn or manufacture and repair of fences, tool handles, wagon parts, or other
5 wooden implements. Off-farm revenue uses may include sale for raw material in furniture
6 making, or of the harvest residues to a facility like VRG. Softwood species grown within
7 these farms' woodlots include spruce, fir, pine, and other species ideal for lumber,
8 biomass, and pulp production due to their high cellulose content.³⁴ On -farm uses may
9 include lumber for re-siding a farm building or as fuel wood for a farm's maple sap
10 evaporator. Off-farm revenue uses may include sale as raw material for dimensional
11 lumber, pulpwood for papermaking, or in chipping the tops of those pre-cut trees for a
12 facility like VRG.

13 VRG does not plan to use trees that are valuable for uses such as furniture or
14 building materials as feedstock for its facility, but may use the byproducts of timber
15 harvesting on farms done for those purposes. In fact, the facility cannot use valuable
16 grades of timber as feedstock for VRG and simultaneously qualify as a carbon removal
17 facility under most qualification methods. Only byproducts of timber are typically
18 eligible feedstocks. Whether on their own or in working with a consulting forester,

³³ Overview of Vermont's Forests, VT ANR: <https://fpr.vermont.gov/forest/vermonts-forests#:~:text=The%20northern%20hardwood%20mix%20of,it%20is%20Vermont's%20state%20tree.>

³⁴ Forest & Wood Products Industries' Economic Contributions: Vermont (May 2020): <https://fpr.vermont.gov/sites/fpr/files/documents/2017%20Forest%20and%20Wood%20Products%20Industries%20Economic%20Contributions.pdf>

1 farmers will apply the rationale of woodlot utilization methods to appropriately market or
2 self-utilize higher-grade logs for commodities such as veneer, lumber, and plywood.³⁵
3 Farmers are economically rational actors, and will market wood fiber harvested within
4 their farm woodlots to the highest and best available use that will yield the highest
5 economic benefit to the farmer. Typically, they are already committed to managing their
6 farm woodlots for the growth potential of the highest-quality timber. However, by also
7 purposing byproducts of their timber harvests for use by a facility like VRG, farmers are
8 able to monetize what would otherwise be waste, while supporting renewable energy
9 production and soil improvement initiatives, while also contributing to regional climate
10 action goals.³⁶

11
12 **Q17: Does this conclude your testimony?**

13 A17: Yes

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³⁵ Your Woodlot, Your Legacy (UNH Extension):

https://extension.unh.edu/sites/default/files/migrated_unmanaged_files/Resource008112_Rep11840.pdf

³⁶ Biochar at a glance (USDA): <https://www.climatehubs.usda.gov/sites/default/files/rmrs-biocharatag glance.pdf>

**STATE OF VERMONT
PUBLIC UTILITY COMMISSION**

Case No. 24-3359-INV

Investigation of the Standard Offer Contract)
Between Vermont Renewable Gas, LLC)
And the Standard Offer Facilitator)

DECLARATION OF EVAN DELL'OLIO

I declare that the testimony and exhibits that I have sponsored are true and accurate to the best of my knowledge and belief and were prepared by me or under my direct supervision. I understand that if the above statement is false, I may be subject to sanctions by the Commission pursuant to 30 V.S.A. § 30.

Dated at Ludlow, Massachusetts this 12th day of December, 2024.

Evan Dell'Olio

Evan Dell'Olio