RENEWABLE THERMAL COLLABORATIVE

AstraZeneca and Vanguard Renewables U.S. RNG Agreement

CASE STUDY
February 2024

AstraZeneca's Newark Campus in Delaware

LOCATION
United States

SECTOR
Biopharmaceuticals

TECHNOLOGY DEPLOYED
Renewable Natural Gas

Project Overview

AstraZeneca, a global biopharmaceutical company headquartered in the UK, is partnering with Vanguard Renewables, a U.S.-based developer, owner, and operator of farm-based anaerobic digestion projects, through an agreement to procure renewable natural gas (RNG) for AstraZeneca's U.S. facilities for the next 15 years or more. This is one of the largest business-to-business RNG purchases in the North American voluntary market to date.

Under the agreement, three new-build, on-farm anaerobic digesters operated by Vanguard Renewables will supply 650,000 MMBtu/year of RNG to meet nearly all of AstraZeneca's gas demand at its U.S. research and manufacturing sites by the end of 2026. While the three new dedicated anaerobic digesters are under construction, RNG delivery is already underway; in June 2023, AstraZeneca's Newark Campus in Delaware began sourcing RNG from one of Vanguard Renewables' facilities in Vermont with delivery via common carrier gas pipelines.

RNG, or biomethane, is pipeline-quality gas produced by capturing and upgrading the methane released by decomposing organic matter, including food waste, dairy manure, biomass, and more. Methane is a potent greenhouse gas (GHG): Capturing methane to produce RNG prevents what would otherwise be harmful atmospheric methane emissions.

Procuring RNG from Vanguard Renewables supports AstraZeneca's transition to 100% renewable energy, a key element of the company's flagship Ambition Zero Carbon strategy. Through Ambition Zero Carbon, which is focused on delivering deep decarbonization by halving the company's entire value chain footprint by 2030 and becoming science-based net zero by 2045 at the latest, AstraZeneca is on track to reduce GHG emissions from its global operations (Scope 1 and 2) by 98% by 2026.

> ***"Vanguard Renewables enabled us to accelerate our sustainability journey, and it's exciting to be on the front edge of innovation here."***
>
> **– Andy Wirths**
> *Senior Vice President, Supply Americas, AstraZeneca*

> ***"We want to demonstrate at scale the voluntary pathway of decarbonization through RNG utilization. This is a company-wide initiative from a progressive company that has made a commitment from top to bottom to decarbonize."***
>
> **– John Hanselman**
> *Founder and Chief Strategy Officer, Vanguard Renewables*

Project Origination

To meet the targets set in 2020 by the Ambition Zero Carbon strategy, AstraZeneca considered a variety of renewable thermal decarbonization strategies, including electrification and renewable fuels, and evaluated factors including deployment and operating costs, implementation complexity, scalability, and climate impact. AstraZeneca determined that RNG was the most feasible option to decarbonize its U.S. footprint. With a large natural gas-fueled asset base across its U.S. medicine research and manufacturing facilities, AstraZeneca saw significant value in using RNG as a renewable replacement for fossil natural gas and avoiding expensive production disruptions and the need to replace or retrofit its entire boiler portfolio. Following this decision, AstraZeneca established a clear objective and timeline to acquire RNG by the end of 2026.

In 2020, AstraZeneca's procurement team issued a Request for Information (RFI) to RNG providers, and then selected multiple respondents, including Vanguard Renewables, to bid in a Request for Proposals (RFP) process.

AstraZeneca detailed clear criteria in the RFP to ensure the RNG agreement would meet its financial and sustainability requirements. Financially, AstraZeneca sought a long-term contract to ensure a reliable RNG supply and future RNG price certainty. On sustainability, AstraZeneca specifically sought solutions that emphasized environmental benefits through the additionality of new RNG production, geographic proximity of the new anaerobic digesters to AstraZeneca's sites, and traceability of the environmental attributes associated with the RNG.

Getting to Yes

After AstraZeneca selected Vanguard Renewables through the RFP, the companies initiated a joint due diligence process, using open dialogue to better understand the proposed approach to RNG delivery. AstraZeneca's senior leadership visited an on-farm anaerobic digestion facility to understand how Vanguard Renewables develops projects that capture methane emissions, improve farm operations, and provide a diversified revenue stream to family-owned farms.

Vanguard Renewables' Farm Powered anaerobic digestion facility in Salisbury, Vermont

> ***"There's a very common vision set by their CEO and senior leadership that's communicated really well throughout the organization. I think it's really interesting as an outsider—we intersect so many different layers of AstraZeneca at the plant and the research facilities—and what's intriguing to us is the consistency of message and vision within AstraZeneca, which I think is part of the way that they've been able to move so well through this process."***
>
> **– John Hanselman**
> *Founder and Chief Strategy Officer, Vanguard Renewables*

AstraZeneca and Vanguard Renewables established a project governance group with delegates from both companies to work through contractual considerations, including those related to GHG emissions accounting and RNG traceability. Because AstraZeneca emphasized the geographic proximity of the RNG production and consumption as a key sustainability attribute, the farm siting team at Vanguard Renewables became involved in linking specific farms to AstraZeneca's research and manufacturing facilities.

Over time, AstraZeneca and Vanguard Renewables found that the governance group played a pivotal role in the successful collaboration between the companies, and they will look to the group moving forward to maintain the relationship, monitor contract performance, and support quarterly and annual environmental, social, and governance (ESG) reporting requirements.

The RNG contract structure is similar to a power purchase agreement (PPA) for renewable electricity. Under the contract, Vanguard Renewables covers the capital costs of constructing the digesters and AstraZeneca pays a fixed price (per MMBtu) for RNG deliveries with an agreed-upon escalator over the 15-year term. The contract also includes a five-year extension option, and provisions to manage a range of considerations and risks, including volumetric guarantees to ensure that Vanguard Renewables delivers the volumes that AstraZeneca requires and long-term price stability to protect against fuel price volatility. AstraZeneca's long-term off-take commitment also provided Vanguard Renewables with the revenue certainty needed to move the new-build projects forward.

The companies approached GHG emissions accounting and carbon intensity evaluation through multiple frameworks, including: the Greenhouse gases, Regulated Emissions, and Energy use in Technologies (GREET) model; the Greenhouse Gas Protocol Corporate Accounting and Reporting Standard (revised edition); and the International Sustainability and Carbon Certification (ISCC) standard. Vanguard Renewables conducted the GHG emissions analysis of a prototypical on-farm digester producing RNG across each of the selected frameworks and found that carbon intensity ranged from -15 to -120 gCO2e/MJ. Carbon intensity is a measure of the lifecycle GHG emissions of a fuel per unit of energy; producing RNG using waste that would otherwise emit methane to the atmosphere results in a negative carbon intensity. Through this GHG emissions accounting and carbon intensity evaluation, AstraZeneca validated its strategy of partnering with Vanguard Renewables to build new digesters and produce new RNG as a pathway to achieve its ambitious decarbonization targets.

In accordance with AstraZeneca's sustainability criteria for RNG traceability, Vanguard Renewables will inject RNG from the new digesters into common carrier gas pipelines, matching AstraZeneca's U.S. gas consumption on a one to one energy basis (MMBtu) as tracked by a gas marketer. AstraZeneca will then purchase and retain all the environmental attributes associated with the RNG to reduce its Scope 1 emissions. The M-RETS platform will be used to independently verify and track the generation and retirement of renewable thermal certificates. AstraZeneca's energy usage data is subject to an annual, independent third-party assurance process to review and validate data and confirm that claims relating to the supply of RNG can be substantiated.

> ***"Now that this partnership has been created, my hope is that for the next company striving to decarbonize, it will be much easier. Part of our ambition for AstraZeneca is that we pave the way for others to follow. Hopefully it's easier for others now that this pathway is defined."***
>
> **– Andy Wirths**
> *Senior Vice President, Supply Americas, AstraZeneca*

Key Outcomes

It took AstraZeneca and Vanguard Renewables two and a half years from the RFI and initial conversations to execute the contract and initiate RNG delivery from one of Vanguard Renewables' facilities in Vermont. While the learning required for this first-of-a-kind agreement made the process more challenging than executing a standard purchase order, the companies approached contract negotiations with transparency, collaboration, and an emphasis on shared values. As Vanguard Renewables prepares three new dedicated on-farm anaerobic digestion facilities to supply RNG to AstraZeneca before the end of 2026, the governance group will continue to meet and communicate progress on the anaerobic digestion facilities, RNG delivery, and emissions impacts. Building on this collaboration, AstraZeneca and Vanguard Renewables announced a planned expanded collaboration in November 2023 to significantly increase the productivity of RNG generation and enhance the RNG supply chain.

AstraZeneca's use of RNG in the U.S. will further enable the company's transition to 100% renewable energy for heat and power. By working with small family-owned farms that are proximate to AstraZeneca's facilities to capture food waste and dairy manure, Vanguard Renewables is providing a reliable and diversified revenue stream to family farms, improving food waste and manure handling to protect the local environment, and preventing atmospheric methane emissions.

Lessons Learned

- **Internal organizational support is essential.** Buy-in and value alignment within AstraZeneca to support decarbonization efforts proved critical in the contracting process. AstraZeneca established a clear goal, pathway, and timeline for RNG procurement. Senior leadership communicated this vision throughout the company, so employees were excited about and unified by this global sustainability ambition. Projects are more likely to be successful when buyers have defined and communicated the objective before beginning procurement.
- **Buyer-seller partnerships help overcome barriers.** AstraZeneca and Vanguard Renewables worked to overcome challenges in the procurement process through transparency and collaboration, which proved critical to project success. The companies formed a governance group during the contracting process to enhance their collaboration and have decided to maintain that group moving forward to continuously monitor project outcomes.
- **Robust sustainability criteria create positive climate impacts.** AstraZeneca and Vanguard Renewables focused on climate impact from the outset, shaping this procurement to ensure that it creates new renewable gas production capacity, prevents atmospheric methane emissions, and reduces AstraZeneca's Scope 1 emissions.
- **Transparency in GHG emissions accounting is critical.** As the Greenhouse Gas Protocol updates its guidance for RNG emissions accounting, AstraZeneca and Vanguard Renewables are working to comprehensively document the environmental attributes and impacts of this procurement, and have evaluated the carbon impacts of the projects using multiple methodologies. AstraZeneca and Vanguard Renewables have been willing to share this experience with other stakeholders to provide a model for how commercial and industrial users can evaluate and deploy RNG as an impactful decarbonization solution.

RTC Information: Next Steps for Interested Buyers

Buyers interested in learning more about renewable thermal should:

- Read more case studies from the RTC to learn how energy users and solutions providers are deploying renewable thermal fuels and technologies.
- Find a list of solutions providers through the RTC's Partner Locator.
- Join the RTC to participate in Working Group meetings, learn about thermal decarbonization strategies from other renewable thermal buyers, and connect with solutions providers. Contact the RTC's Membership Director, Perry Hodgkins Jones (perry@dgardiner.com) to learn more.
- See more information on the applications and market potential for RNG in the Renewable Thermal Vision Report.

RENEWABLE THERMAL COLLABORATIVE

The Renewable Thermal Collaborative (RTC) is the global coalition for companies, institutions, and governments committed to scaling up renewable heating and cooling at their facilities. Learn more about our thermal decarbonization work at www.renewablethermal.org.

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