

THE SMELL OF MONEY: HOW STATE LEGISLATURES CAN ENCOURAGE THE PRODUCTION OF RENEWABLE NATURAL GAS FROM AGRICULTURAL WASTE

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I. INTRODUCTION

“Natural gas is a versatile, clean-burning, and efficient fuel that is used in a wide variety of applications across the United States.”¹ Traditionally, natural gas has been extracted from earth as a fossil fuel. Fossil natural gas, like all energy

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1. *Uses of Natural Gas*, UNION CONCERNED SCIENTISTS (Apr. 3, 2015), <https://www.ucsusa.org/resources/uses-natural-gas> [<https://perma.cc/P5G4-N58G>].

sources, is not a perfect fuel.² Fossil natural gas is often found deep in the earth.³ It is a non-renewable source of energy, so existing deposits of fossil natural gas will eventually become impossible to replace or replenish. Pushing to find new sources of fossil natural gas is becoming increasingly expensive and destructive to the environment.⁴ In deciding energy policy, state lawmakers would be wise to look for sources of natural gas already on earth's surface.

Renewable natural gas (RNG) is natural gas that is produced by organic resources, upgraded to acceptable standards, and then put into commercial use via existing natural gas infrastructure.⁵ Organic resources that produce RNG vary.⁶ The production of RNG is a relatively new technological innovation that should be attractive to state governments hoping to achieve shrewd climate and energy policy goals.⁷ The advent of RNG has made it so states that have traditionally and exclusively consumed natural gas now have an opportunity to become natural-gas producing.⁸ This note will analyze RNG from three perspectives: (1) the environmental and economic benefits of RNG produced from manure and agricultural residues; (2) state governments that are encouraging the production of RNG; and (3) state governments that stand to benefit from future investment into the production of RNG.

2. See *Environmental Impacts of Natural Gas*, UNION CONCERNED SCIENTISTS (June 19, 2014), <https://www.ucsusa.org/resources/environmental-impacts-natural-gas#:~:text=Natural%20gas%20is%20a%20fossil,new%20coal%20plant%20%5B1%5D> [<https://perma.cc/8Y86-CSN5>].

3. Chris Sherwood, *How is Natural Gas Mined?*, SCIECING (Apr. 24, 2017), <https://sciencing.com/how-natural-gas-mined-4884857.html> [<https://perma.cc/Y9WU-QTUJ>].

4. See Valeria J. Brown, *Radionuclides in Fracking Wastewater: Managing a Toxic Blend*, 122 ENV'T HEALTH PERSP. 51, 51 (2014), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3915249/pdf/ehp.122-A50.pdf> [<https://perma.cc/FL2G-XDHF>].

5. Nathan Parker et al., *Renewable Natural Gas in California: An Assessment of the Technical and Economic Potential*, 111 ENERGY POLICY 235, 235 (2017).

6. See *id.*

7. See Erin Voegelé, *Minnesota Bill Aims to Encourage Alternative Fuels, Including RNG*, BIOMASS MAG. (Feb. 21, 2020), <http://biomassmagazine.com/articles/16833/minnesota-bill-aims-to-encourage-alternative-fuels-including-rng> [<https://perma.cc/Q65C-Y244>].

8. See *id.*; see also Markus Lauer et al., *Making Money from Waste: The Economic Viability of Producing Biogas and Biomethane in the Idaho Dairy Industry*, 222 APPLIED ENERGY 621, 632 (2018).

II. RENEWABLE NATURAL GAS FROM MANURE AND AGRICULTURAL RESIDUES

A. Renewable Natural Gas v. Fossil Natural Gas

RNG begins as animal manure from livestock operations.⁹ This manure is collected and delivered to anaerobic digesters to stabilize and optimize methane production.¹⁰ The resulting biogas can be processed into RNG, which is then sold and distributed to customers through the existing natural gas pipeline network.¹¹

Fossil natural gas is traditionally retrieved through a “horse head” pump, which moves up and down to lift a rod in and out of a well bore. A horse head pump brings gas to the surface.¹² Additionally, production of fossil natural gas increasingly relies on the controversial practice of hydraulic fracturing to meet market demands.¹³ Hydraulic fracturing is controversial because it has negative impacts on land use, air emissions, water contamination, and noise pollution, as well as adverse effects on human health.¹⁴

Additionally, fossil natural gas can only be produced in states that have natural gas reserves to tap into. This creates a dichotomy of haves and have-nots in the energy market. The states without fossil fuel reserves are seriously disadvantaged when trying to secure cheap energy for their citizenry.¹⁵

RNG can be produced without the negative environmental and political cloud that shrouds hydraulic fracking. In fact, the production of RNG has a positive impact on the environment.¹⁶ Large concentrations of livestock on a farm can lead to high nitrate concentration in the surrounding groundwater and soil.¹⁷ Such

9. Parker et al., *supra* note 5, at 237.

10. *Id.*

11. *Id.* at 236.

12. *Where Does Natural Gas Come From*, NAT. GAS SOL. (May 29, 2021, 2:54 PM), <http://naturalgassolution.org/natural-gas-come/> [<https://perma.cc/ZHF5-KJ6J>].

13. See Alison M. Bamber et al., *A Systematic Review of the Epidemiologic Literature Assessing Health Outcomes in Populations Living near Oil and Natural Gas Operations: Study Quality and Future Recommendations*, INT. J. ENV'T RSCH. PUB. HEALTH, June 2019, at 1, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6616936/> [<https://perma.cc/64D8-SHKE>].

14. *Id.*

15. See STATE OF IOWA ENERGY SECTOR RISK PROFILE, U.S. DEP'T ENERGY (May 29, 2021, 2:46 P.M.), https://www.energy.gov/sites/prod/files/2016/09/f33/IA_Energy%20Sector%20Risk%20Profile.pdf [<https://perma.cc/VT9-SSF9>].

16. See Parker et al., *supra* note 5, at 235.

17. Lauer et al., *supra* note 8, at 621.

livestock concentrations may also pose health risks by contaminating water systems and soil with manure and pathogens.¹⁸

If the manure created by large concentrations of livestock were used in RNG production, it would not be polluting soil or water.¹⁹ In addition to the positive environmental impact, using manure in RNG production would reduce odor emissions.²⁰ Thus, the mere process of producing RNG offers many non-market benefits before it is even sold to customers.

RNG procurement also reduces harmful emissions.²¹ RNG procurement captures methane emissions produced from farms and recycles it into clean-burning natural gas.²² As a result, gas that would otherwise be destroyed or enter the atmosphere as fugitive pollution could instead be purified and put toward economic use.²³ When measured “cradle-to-grave,” RNG can be carbon neutral or even carbon negative.²⁴ In order “to achieve high-level reductions in atmospheric carbon and methane within the timeframe necessary to avoid the worst impacts of climate change, . . . every viable and effective tool [should be utilized].”²⁵ RNG is a practical and available tool to combat climate change;²⁶ it will help to address the challenges presented by farm emissions, fossil fuel consumption, and societal waste.²⁷

B. Economic Benefits from Agriculturally-Based Renewable Natural Gas

When RNG is produced and injected into the existing natural gas grid, it mixes with fossil natural gas, and all users of natural gas receive that mixture.²⁸

18. *Id.*

19. *Id.* at 622.

20. *Id.*

21. See Frank Jossi, *Wisconsin Biogas Gas Producer Sees Potential in Thermal Renewable Credits*, ENERGY NEWS NETWORK (Apr. 21, 2020), <https://energynews.us/2020/04/21/midwest/wisconsin-biogas-gas-producer-sees-potential-in-thermal-renewable-credits/> [<https://perma.cc/7NGW-NTNJ>].

22. See *id.*

23. Sam Lehr et al., *RNG’s Growing Role in Decarbonization Strategies*, BIOMASS MAG. (Aug. 26, 2020), <http://biomassmagazine.com/articles/17302/rngundefineds-growing-role-in-decarbonization-strategies/> [<https://perma.cc/7D66-X8YQ>].

24. *Id.*

25. *Id.*

26. *Id.*

27. *Id.*

28. U.S. EPA, AN OVERVIEW OF RENEWABLE NATURAL GAS FROM BIOGAS 1 (July 2020), https://www.epa.gov/sites/production/files/2020-07/documents/lmop_rng_document.pdf [<https://perma.cc/Y6KT-J7QV>].

Therefore, purchasers of RNG do not actually receive pure RNG to use, rather they purchase a displacement of fossil natural gas off the gas grid. This displacement of fossil natural gas is manifested in the market by environmental attributes.²⁹ Environmental attributes are essentially credits that a natural gas customer receives when purchasing RNG, and these credits can be used to demonstrate attempts at sustainability or to advertise the use of renewable energy.³⁰ Environmental attributes are also sometimes called “thermal credits” or “renewable energy credits,” but these terms mean the same thing.³¹ Functionally, environmental attributes make RNG a more valuable product than fossil natural gas, which in turn encourages the market to supply more RNG.

Some critics are concerned that the potential for fraud is too great because environmental attributes are an abstract product both purchased and sold within the RNG industry.³² There is nothing physically stopping an RNG producer from selling environmental attributes for the same quantity of gas to multiple companies. This concern is why certain organizations—such as the Midwest Renewable Energy Tracking System (M-RETS)—have formed to provide surety for market participants.³³

M-RETS tracks environmental attributes produced and sold by RNG producing facilities.³⁴ M-RETS refers to the environmental attributes they oversee as “thermal certificates.”³⁵ It believes thermal certificates can create a more robust market for RNG in the same way renewable energy credits did for wind and solar.³⁶ There are projects registered with M-RETS in every state and province across North America.³⁷ Since cost remains the primary barrier to expanding RNG, a more robust tax-credit subsidy program is likely to spur more private investment into RNG production.³⁸

29. *See id.* at 17.

30. *See id.* at 35.

31. *See, e.g.,* Frank Jossi, *Will Renewable Natural Gas Credits Help Jumpstart New Market for Biogas?*, ENERGY NEWS NETWORK (July 11, 2019), <https://energynews.us/2019/07/11/midwest/will-renewable-natural-gas-credits-help-jumpstart-new-market-for-biogas/> [<https://perma.cc/48GL-AGUC>].

32. *Id.*

33. *Id.*

34. U.S. GAIN, *US Gain to Provide RNG Through New M-RETS RTC Platform*, BIOMASS MAG. (Jan. 31, 2020), <http://biomassmagazine.com/articles/16783/us-gain-to-provide-rng-through-new-m-rets-rtc-platform> [<https://perma.cc/XN8F-AL7W>].

35. *Id.*

36. Jossi, *supra* note 31.

37. U.S. GAIN, *supra* note 34.

38. Jossi, *supra* note 21.

The use of renewable energy credits in the wind and solar industries is a demonstration of how, even when not yet cost-effective, RNG production can still develop.³⁹ Encouraging the use of environmental attributes potentially opens a huge residential, commercial, and industrial market.⁴⁰

RNG is good for rural economies, as thousands of new jobs are estimated to be created from its development.⁴¹ Nearly every rural area in the United States produces waste capable of conversion into RNG.⁴² “And because RNG is transported through existing gas pipelines, expanded use of RNG does not require significant infrastructure investment.”⁴³

Large companies are beginning to recognize the demand for environmental attributes.⁴⁴ For example, L’Oreal announced its goal to achieve carbon neutrality in 2019 by using RNG at its 21 manufacturing facilities within the United States.⁴⁵ Many corporations will pay a premium for RNG to advertise sustainability goals and achievements.⁴⁶

III. STATE LEGISLATION AND ADMINISTRATIVE POLICY THAT ENCOURAGES RENEWABLE NATURAL GAS PRODUCTION

The technology that allows for the creation of RNG is relatively new, and state regulations are only recently beginning to catch up.⁴⁷ Vermont is the only state whose executive branch made regulatory rules encouraging the development of RNG without explicit statutory instruction to do so.⁴⁸ As such, Vermont is a unique state in this analysis.

39. Adam Aston, *This Carbon Challenge Is Bigger Than Cars, Aviation and Shipping Combined*, GREENBIZ (Aug. 13, 2020), <https://www.greenbiz.com/article/carbon-challenge-bigger-cars-aviation-and-shipping-combined> [<https://perma.cc/K4F9-KCUH>].

40. See Jossi, *supra* note 31.

41. Lehr et al., *supra* note 23.

42. *Id.*

43. *Id.*

44. Sarah Golden, *Let’s talk about Renewable Energy Certificates ... for Natural Gas*, GREENBIZ (July 19, 2019), <https://www.greenbiz.com/article/lets-talk-about-renewable-energy-certificates-natural-gas> [<https://perma.cc/2JLJ-CZSN>].

45. *Id.*

46. See *id.*

47. See Bentham Paulos, *Analysis: Why Utilities Aren’t Doing More with Renewable Natural Gas*, ENERGY NEWS NETWORK (Feb. 14, 2019), <https://energynews.us/2019/02/14/west/analysis-why-utilities-arent-doing-more-with-renewable-natural-gas/> [<https://perma.cc/D7FV-WA4N>].

48. See generally *Petition of Vermont Gas Systems, Inc. for a Renewable Natural Gas Program and Optional Tariff*, Docket No. 8667, “Final Order” (Vt. P.U.C. Sept. 6, 2017).

A. Vermont

The Vermont Public Utility Commission (Vermont Commission) began encouraging its natural gas utilities to procure RNG without an express instruction from their legislature.⁴⁹ Instead, the Vermont Commission relied on a broad interpretation of the term “general good” and a requirement that rate-regulated utilities assess environmental as well as economic costs before being issued a Certificate of Public Good (CPG).⁵⁰

The pathway to an RNG market in Vermont began with an order on December 23, 2013, made by the Vermont Commission, in which a CPG was granted to Vermont Gas Systems’ (VGS) for an extension of their natural gas transmission and distribution system.⁵¹ As part of the post-certificate review procedure, VGS was instructed to file a petition addressing biomethane development in the state of Vermont.⁵² The Vermont Commission’s authority to require VGS to file a petition addressing biomethane development was derived from 30 Vt. Stat. Ann. § 248(a)(3), which states, “No company...may in any way begin site preparation for or commence construction of any natural gas facility...unless the [Vermont Commission] first finds that [it] will promote the general good of the State.”⁵³ Additionally, 30 Vt. Stat. Ann. § 248(b)(2) instructs the Vermont Commission to interpret general good broadly to include environmental well-being, and, as a result, the Vermont Commission determined VGS’s pipeline extension could not promote the general good if it only furthered the use of fossil natural gas.⁵⁴

In order to comply with the Vermont Commission’s order to address biomethane development, VGS submitted an RNG-Program Plan on February 12, 2016.⁵⁵ The RNG-Program Plan incorporated RNG into VGS’s supply portfolio, and allowed customers to purchase RNG.⁵⁶ Customers who choose to purchase RNG have an additional rate rider attached to their bill, making RNG a more

49. *See generally id.*

50. *See* 30 VT. STAT. ANN. §§ 248(a)(3), (b)(2); *Petition of Vermont Gas Systems, Inc. for a Certificate of Public Good*, Docket No. 7970, “Final Order” (Vt. P.U.C. Dec. 23, 2013).

51. *See Petition of Vermont Gas Systems, Inc. for a Certificate of Public Good*, Docket No. 7970, “Final Order” (Vt. P.U.C. Dec. 23, 2013).

52. *See id.*

53. 30 VT. STAT. ANN. § 248(a)(3).

54. *See id.* § 248(b)(2).

55. *See generally Petition of Vermont Gas Systems, Inc. for a Renewable Natural Gas Program*, Docket No. 8667, “Revised Renewable Natural Gas Plan” (Vt. P.U.C. Feb. 12, 2016).

56. *Id.* at 1.

valuable energy source to produce.⁵⁷ It is not practical for VGS to deliver RNG to customers; instead, VGS injects RNG into the existing natural gas pipeline at the site where it is produced.⁵⁸ When customers purchase RNG from VGS, they are purchasing a displacement of fossil natural gas off the natural gas grid (previously described in this paper as an environmental attributes).⁵⁹

It is difficult for any natural gas supplier to produce the exact volume of natural gas ordered. VGS contemplates this issue in their RNG-Program Plan; it explains that in circumstances where they produce less RNG than the Vermont market orders, they will purchase RNG from other suppliers in order to meet demand.⁶⁰ And, conversely, when VGS produces more RNG than the Vermont market orders, VGS will sell the remaining RNG to other natural gas suppliers.⁶¹ Environmental attributes are what is being traded between natural gas suppliers to meet consumer demand for RNG.⁶²

On September 6, 2017, the Vermont Commission issued an order approving VGS's RNG-Program Plan.⁶³ The Vermont Commission stated that the RNG-Program Plan was a reasonable plan to promote biomethane development.⁶⁴ The Vermont Commission reasoned that offering customers the opportunity to purchase RNG will stimulate demand, and demand for RNG will stimulate development of the energy source.⁶⁵ Furthering the development of renewable energy sources that will be delivered through natural gas infrastructure makes the development of that infrastructure serve the general good—as the Vermont Commission interprets the term—thereby satisfying 30 Vt. Stat. Ann. §§ 248(a)(3), (b)(2).⁶⁶ Further, the Vermont Commission claimed that the RNG-Program Plan would progress the Vermont Comprehensive Energy Plan goal to supply 90% of Vermont's energy through renewable sources by 2050.⁶⁷

The approval of VGS's RNG-Program Plan was a significant achievement for Vermont, as the plan effectively introduced the state to the RNG market.

57. *Id.* at 3.

58. *See id.*

59. *See id.*

60. *See id.* at 3.

61. *Id.*

62. *See id.*

63. *See Petition of Vermont Gas Systems, Inc. for a Renewable Natural Gas Program and Optional Tariff*, Docket No. 8667, "Final Order," 13 (Vt. P.U.C. Sept. 6, 2017).

64. *Id.* at 9.

65. *Id.*

66. *Id.*

67. *Id.*

B. Minnesota

On February 11, 2020, Senate File 3013 (Minnesota Bill) was read for the first time in the Minnesota Senate.⁶⁸ The Minnesota Bill was moved through the Minnesota Senate Utilities and Finance committees and read before the Minnesota Senate again on May 12, 2020.⁶⁹ The Minnesota Bill eventually passed in the Senate with the intention to “encourage[] natural gas utilities to develop alternative resources.”⁷⁰ The Minnesota Bill was designed to help Minnesota achieve its previously stated goal of having 25% of its total energy come from renewable sources by 2025.⁷¹

The bulk of the Minnesota Bill introduces “Alternative Resource Plans” and the “Renewable Gaseous Fuel Inventory.”⁷² Alternative Resource Plans are optional filings that natural gas utilities may make with the Minnesota Public Utilities Commission.⁷³ A natural gas utility’s Alternative Resource Plan must include: (1) discussion of any pilot program related to the development of renewable natural gas or alternative resources; (2) a third-party analysis of the lifecycle of greenhouse gas intensity of any alternative resources proposed to be included; (3) a third-party analysis of the forecasted lifecycle greenhouse gas emissions reductions achieved or the lifecycle greenhouse gas emissions avoided; (4) the process used to develop the lifecycle greenhouse gas accounting methodology implemented throughout the plan; (5) “whether the recommended plan supports the development and use of alternative agricultural products, waste reduction, . . . or anaerobic digestion of organic waste;” (6) a description of third-party systems the utility plans to use to ensure that environmental benefits are used only for their plan and are not claimed for any other program; (7) a description of known local job impacts and the steps the utility and its energy suppliers and contractors are taking to maximize the availability of construction employment opportunities for local workers; and (8) “a report on the utility’s progress toward implementing the [approved proposals] contained in its previously filed alternative resource plan, if applicable.”⁷⁴

The making of an Alternative Resource Plan is a long and cumbersome process.⁷⁵ The payoff for natural gas utilities is the recovery of capital investments

68. *See* S.F. 3013, 91st Leg., Reg. Sess. (Minn. 2020).

69. *See id.*

70. *Id.*

71. *See generally id.* § 2(3).

72. *Id.* §§ 2-4.

73. *See id.* § 2.

74. *Id.* § 2(3).

75. *See generally id.* §§ 2-4.

made into RNG production through their rates charged to customers.⁷⁶ It remains to be seen how the Minnesota Commission will implement rules in accordance with the Minnesota Bill and how natural gas utilities and ratepayers will dually respond. Nonetheless, how the Minnesota Bill ultimately impacts the state's development of RNG will be examined closely over the coming years by industry advocates.

Despite the large regulatory hurdles the Minnesota Bill creates, it simultaneously creates tangible public benefits. RNG is a new source of energy with environmental benefits that have yet to be widely scrutinized. The regulatory scheme outlined in the Minnesota Bill brings third-party environmental analysts to the table to ensure the economic investments put into RNG have desirable environmental benefits.⁷⁷ It also requires natural gas utilities to develop a plan for verifying environmental attributes being sold are for the actual quantities of RNG being produced, and that environmental attributes for a certain quantity of RNG are not being applied multiple places.⁷⁸

C. Colorado

On January 28, 2020, a bill titled "Adopt Renewable Natural Gas Standard" (Colorado Bill) was introduced in the Colorado Senate.⁷⁹ On March 2, 2020, the Colorado Bill was introduced in the Colorado House of Representatives and assigned to the Energy and Environment Committee.⁸⁰ On May 28, 2020, the Energy and Environment Committee in the Colorado House of Representatives recommended the Colorado Bill be postponed indefinitely.⁸¹ This postponement was likely to focus the state's efforts to address the COVID-19 pandemic. Despite the Colorado Bill's indefinite postponement, it is still instructive in showing how the Colorado Legislature contemplated RNG.

The Colorado Bill would have inserted RNG into large natural gas utilities' portfolio targets.⁸² The Colorado Bill would have directed the Colorado Public Utilities Commission (Colorado Commission) to adopt rules governing an RNG program for the natural gas utilities it regulates.⁸³ The rules to be written by the

76. *See id.*

77. *See id.* § 2.

78. *See id.* § 2(3)(5).

79. *See* S.B. 150, 72d Gen. Assemb., 2d Reg. Sess. (Colo. 2020).

80. *See id.*

81. LEGISCAN (July 19, 2021, 6:03 PM), <https://legiscan.com/CO/bill/SB150/2020> [<https://perma.cc/3G9T-J732>].

82. *Id.* § 1(4)(a)

83. *Id.* §§ 1(4)-(5).

Colorado Commission would have allowed natural gas utilities to recover investments into RNG procurement from their customers.⁸⁴

The Colorado Commission would have also been directed to establish a system of “tradeable [RNG] environmental attributes credits that may be used by [natural gas utilities] for the sole purpose of complying with this section.”⁸⁵ Presumably, the intent was for the Colorado Commission to create a regulatory scheme overseeing natural gas utilities’ buying and selling of environmental attributes amongst one another to help them reach their RNG portfolio goals. Additionally, the Colorado Bill stipulated that the only utilities to have access to the environmental attribute market were those which implemented an RNG program pursuant to the Colorado Commission’s rules.⁸⁶

The Colorado Bill has several well-reasoned provisions that would likely help Colorado reach its energy and environmental policy goals. Natural gas utilities are encouraged to participate in an RNG program as they are given the opportunity to recover the costs of capital investments in their rates charged to customers.⁸⁷ Additionally, natural gas utilities in Colorado are incentivized to participate in the renewable natural gas program because participation in the program is the only way to enter the RNG environmental attribute market.⁸⁸ The Colorado Bill is less regulatory and burdensome than the Minnesota Bill in that it does not require natural gas utilities to hire third-party participants to oversee their RNG plans.⁸⁹

D. Oregon

On January 14, 2019, an Oregon Senate Bill titled, “Relating to renewable natural gas; and prescribing an effective date” (Oregon Bill) was read before the Oregon Senate.⁹⁰ The Oregon Bill then passed through several Senate committees, with the Senate hearing and officially passing the Oregon Bill again on June 13, 2019.⁹¹ On June 17, 2019, the Oregon Bill was read before the Oregon House of Representatives.⁹² The Oregon Bill then made its way through the Oregon House Ways and Means Committee; it was read again and passed by the Oregon House

84. *Id.* § 1(3)(b)(ii).

85. *Id.* § 1(6)(c).

86. *See id.*

87. *Id.* § 1(3)(b)(ii)

88. *See id.* § 1(6)(c).

89. *See id.*; *but see* S.F. 3013, 91st Leg., Reg. Sess. (Minn. 2020).

90. *See* S.B. 98, 80th Legis. Assemb., Reg. Sess. (Or. 2020).

91. *See id.*

92. *See generally id.*

of Representatives on June 19, 2019.⁹³ Oregon Senate Bill No. 98 was codified into law under Oregon Revised Statutes §§ 757.390-.398 (Oregon Law).⁹⁴

The Oregon Law requires the Oregon Public Utility Commission (Oregon Commission) to adopt rules allowing large natural gas utilities to enter into an RNG program.⁹⁵ The Oregon Law also requires the Oregon Commission adopt separate rules permitting small natural gas utilities to join a separate RNG program tailored for smaller businesses.⁹⁶ The Oregon Commission is required to create RNG programs in which reporting requirements for both large and small natural gas utilities are established.⁹⁷ They must also set regulatory guidelines that allow for the procurement of RNG, allow for investments into RNG infrastructure, while also protecting Oregon consumers.⁹⁸

On July 16, 2020, the Oregon Commission issued an order creating several administrative rules (Oregon Rules) to comply with the Oregon Law.⁹⁹ Before being implemented, the Oregon Rules went through a comprehensive development process with “broad and sustained participation [from] numerous stakeholders.”¹⁰⁰ Stakeholders involved in the rule development process included natural gas companies, environmental groups, and consumer advocacy groups.¹⁰¹ All comments received by the Oregon Commission were “generally supportive of the proposed rules, with some offering suggestions for revisions.”¹⁰²

A notable revision made to the Oregon Rules during their development was to how environmental attributes and Renewable Thermal Certificates trading would be overseen.¹⁰³ The Oregon Rules initially required natural gas utilities to obtain and keep records of all renewable thermal credits sold or bought by them, and track the credits from their creation until their retirement.¹⁰⁴ Natural gas utilities argued that these requirements were overly burdensome and redundant if

93. *See generally id.*

94. *See* Or. Rev. Stat. §§ 757.390-.398

95. *Id.* § 757.396.

96. *Id.* § 757.398

97. *Id.* § 757.390(2)(a).

98. *Id.* § 757.390(2)(b).

99. *See In the Matter of Rulemaking Regarding the 2019 Senate Bill 98 Renewable Natural Gas Programs*, Docket No. AR 632, Order No. 20-227, at 1 (Or. P.U.C. 2020).

100. *Id.*

101. *See id.* at 2.

102. *Id.* at 2.

103. *See id.* at 9-10.

104. *See id.* at 23.

used alongside the electronic tracking system already proposed.¹⁰⁵ The Oregon Commission agreed and struck sections requiring natural gas utilities to keep records outside of the electronic system from the rules.¹⁰⁶

The Oregon Rules direct utilities to use the electronic system previously referred to as the M-RETS system.¹⁰⁷ M-RETS was attractive to the Oregon Commission because it is a web-based, tracking system that offers “increased market transparency, higher level[s] of integrity and assurance...and scientifically validated carbon values to facilitate [greenhouse gas] reduction claims.”¹⁰⁸

The Oregon Bill, Law, and Rules received broad support at every stage of development.¹⁰⁹ When the Oregon Bill was voted on in each of the state’s legislative bodies, it had bipartisan support.¹¹⁰ In Oregon’s Senate, the bill passed 25-3 with nay votes coming from only 3 of 12 of Oregon Senate Republicans.¹¹¹ In the Oregon House of Representatives, the bill passed 48-10 with nay votes coming from only 10 of the 22 Oregon House Republicans.¹¹² As the Oregon Rules were drafted, they received support from all stakeholders.¹¹³ It can be concluded that the Oregon Bill, Law, and Rules are positive examples for other state governments as they look to expand their state’s use of RNG.

IV. HOW AND WHY OTHER AGRICULTURAL STATE GOVERNMENTS SHOULD ENCOURAGE THE DEVELOPMENT OF RENEWABLE NATURAL GAS

The capital needs for RNG projects are still prohibitive to the development of the RNG facilities.¹¹⁴ “On average, each RNG project requires \$17 million of capital investment.”¹¹⁵ This expense puts state governments in a critical role at this stage of the industry’s growth. In order for the public benefits of a robust RNG

105. *See id.* at 9-10.

106. *Id.*

107. *See In the Matter of Rulemaking Regarding the 2019 Senate Bill 98 Renewable Natural Gas Programs*, Docket No. AR 632, “M-Rets Presentation from the December 13, 2019 Workshop” slide 18 (Or. P.U.C. 2019).

108. *See id.* slide 7.

109. *See In the Matter of Rulemaking Regarding the 2019 Senate Bill 98 Renewable Natural Gas Programs*, Docket No. AR 632, Comments (Or. P.U.C. 2020).

110. *See* S.B. 98, OR. STATE LEGIS. (May 29, 2021, 2:47 P.M.), <https://olis.oregonlegislature.gov/liz/2019R1/Measures/Overview/SB0098> [<https://perma.cc/38ZG-VQT2>].

111. *See generally id.*

112. *See generally id.*

113. *See generally id.*

114. *See* Aston, *supra* note 39.

115. *Id.*

market to be realized, the market must be nudged out of the gate by the public sector. The states discussed above have recognized this need. At a minimum, states should begin laying regulatory groundwork to facilitate a market for RNG, if not outright subsidizing capital investments into its procurement.

“Over the past five years, RNG supply has increased by 291%.”¹¹⁶ While this growth is commendable, more should be done to increase consumer access to RNG.¹¹⁷ The RNG market is similar to what the renewable electric market was a decade ago.¹¹⁸

A. Encouraging the Voluntary Market to Develop

Private investment into RNG infrastructure is increasing.¹¹⁹ Seventy-two farms in 11 states of the United States are making investments into RNG as a way to not only cut emissions, but to better manage massive tons of cow manure while increasing their income.¹²⁰ Because of increasing state emission regulations, many companies need to buy RNG.¹²¹ Companies forced to buy RNG are incentivizing the industry to expand rapidly.¹²²

Despite the growing demand for RNG, a clear regulatory framework is still needed in many states. Such a framework—like that found in Oregon—would facilitate RNG procurement and trading, and it would likely encourage more private investment.

B. Investing in Renewable Natural Gas Infrastructure

RNG has recently been described as a “gold rush.”¹²³ The evolution of manure digesters has led to major discoveries in new markets and revenue

116. Lehr et al., *supra* note 23.

117. *Id.*

118. Jossi, *supra* note 31.

119. See Arlene Karidis, *Vanguard Renewable and Partners Tap into Dairy Biogas for RNG*, WASTE360 (Jan. 5, 2021), <https://www.waste360.com/waste-energy/vanguard-renewables-and-partners-tap-dairy-biogas-rng> [<https://perma.cc/75V9-ASNQ>].

120. *Id.*

121. See, e.g., *id.* (showing that California requires oil refiners and distributors ensure their fuel meets greenhouse gas emissions targets).

122. *Id.*

123. Grace Connatser, *What Does 2021 Hold for the Dairy Industry in Regards to Sustainability, Trade Outlook*, WIS. STATE FARMER (Dec. 22, 2020), <https://www.wisfarmer.com/story/news/2020/12/22/american-dairy-coalition-offers-sustainability-trade-outlook-2021/6539470002/> [<https://perma.cc/ZRR6-4SGE>].

streams.¹²⁴ “Even Walmart and the UPS are converting their shipping fleets from diesel to natural gas. . . .”¹²⁵ RNG has become increasingly profitable even when compared to the alternative, fossil natural gas.¹²⁶

Time may be of the essence to realize these profits. Many natural gas customers have sustainability targets that can soon be met with 100% renewable electricity, and gas utilities, who realize their customers may soon switch to only a clean electric grid, are recognizing that they need to decarbonize their natural gas network.¹²⁷ Some are doing so by creating aggressive RNG penetration targets.¹²⁸ However, this modest progress is not enough for some localities, as small pockets are already popping up throughout the United States wherein municipal and county building codes are restricting the use of natural gas.¹²⁹

Other countries are beginning to invest in RNG procurement.¹³⁰ Researchers in South Korea are considering massive production of RNG as a means to achieve national energy security.¹³¹ South Korea, for example, is contemplating a strategy in which RNG-producing companies, RNG-providing companies, and regional governments work closely together to successfully integrate RNG into the nation’s energy portfolio.¹³² The public benefits of procuring RNG are substantial enough that South Korean authorities are willing to intervene in order for market conditions to be ripe for investment.¹³³

The European Union has very aggressive climate goals.¹³⁴ As such, researchers in the European Union are also considering whether to advocate for an

124. *Id.*

125. *Id.*

126. *Id.*

127. Arlene Karidis, *Where Is Renewable Natural Gas Moving Forward and What Will This Mean for the Industry and States*, WASTE360 (Apr. 28, 2020), <https://www.waste360.com/gas-energy/where-renewable-natural-gas-moving-forward-and-what-will-mean-industry-and-states-part-2> [https://perma.cc/J8H2-KBJ5].

128. *See id.*

129. *See generally d.*

130. *See, e.g.*, Sung-Min Kim et al., *Households’ Willingness to Pay for Substituting Natural Gas with Renewable Methane: A Contingent Valuation Experiment in South Korea*, 13 ENERGIES, June 15, 2020, at 1.

131. *Id.* at 1.

132. *See id.* at 2.

133. *See id.*

134. *See generally* Cristian Lebelhuber & Horst Steinmuller, *How and to Which Extent Can the Gas Sector Contribute to a Climate-neutral European Energy System? A Qualitative Approach*, 9 ENERGY, SUSTAINABILITY & SOC’Y, June 13, 2019, at 1, 2.

aggressive push towards RNG usage.¹³⁵ European researchers believe that as much as 55% of European gas demand could be met through RNG alone.¹³⁶ European analysts recognize, however, that the production costs of RNG are still substantially higher than the natural gas market price.¹³⁷ Consequently, private investment alone cannot be relied upon to push RNG to its full potential in Europe.¹³⁸ European analysts suggest that RNG is likely a necessary component of Europe's overall energy goals, but that it will only become a component of the continent's energy portfolio if backed by an enabling energy policy framework.¹³⁹ To realize the benefits of RNG, European analysts recommend giving it a level playing field with renewable electricity.¹⁴⁰ Analysts suggest the support schemes be market based and provide sufficiently reliable conditions to be attractive to investors.¹⁴¹

The expanded use of RNG is not devoid of criticism.¹⁴² Some critics estimate that it may cost as much as five to seven times more than fossil natural gas.¹⁴³ It is further asserted by some that RNG will never scale enough to displace more than 10% of fossil natural gas.¹⁴⁴ Additionally, there are some environmentalists who would rather see natural gas die off altogether than switch to RNG.¹⁴⁵ Despite having "renewable" in the name, these environmentalists claim RNG will never be truly green.

In addition, some skeptics wonder whether biogas can fully upgrade to the equivalent of fossil natural gas.¹⁴⁶ One researcher believes that trace contaminants left in RNG could have a negative impact on emissions.¹⁴⁷ This researcher has found that the presence of ammonia in RNG, which can have serious consequences if it is blended into the natural gas pipeline network.¹⁴⁸ These consequences include

135. *See generally id.*

136. *Id.* at 12.

137. *Id.* at 19-20.

138. *Id.*

139. *Id.* at 20.

140. *Id.*

141. *Id.*

142. *See Jossi, supra* note 31.

143. Jossi, *supra* note 21.

144. *Id.*

145. *See generally id.*

146. *See* Linghao Zhao et al., *Pollutant Formation during Utilization of Renewable Natural Gas Containing Trace Ammonia Impurities*, 59 INDUS. & ENG'G. CHEMISTRY RSCH. 19177 (2020).

147. *Id.* at 19177

148. *Id.*

corrosion damage to natural gas transportation and storage infrastructure, corrosion to end-user equipment, and increased pollutant formation during combustion.¹⁴⁹ These findings are serious and should not be overlooked.

However, it is also important to consider these criticisms in the context of where RNG is in its research and development. The technology that produces RNG is still being actively researched and refined.¹⁵⁰ New methods of biomethane production and cleaning are in the process of being researched.¹⁵¹ New Acid-Phase Digesters have the potential to increase the rate and efficiency of biomethane production by allowing for more waste to be converted to biogas for a given digester size.¹⁵² Some of the new biogas purifying methods include Cryogenic Upgrading, In Situ Methane Enrichment, and purification through the use of enzymes.¹⁵³

V. CONCLUSION

States that have large agricultural sectors across the Midwest are positioned to bring their farmers into the energy sector. This collaboration could be done in a number of ways. States could pass laws that encourage natural gas utilities to invest in RNG production from agricultural waste, subsidize farmers' purchases of anaerobic digesters, and draft regulatory frameworks to facilitate the trade of natural gas between farmers and utilities.

RNG production is a developing industry. It offers many benefits over fossil natural gas. During its production, RNG captures manure that would otherwise be harmful to the surrounding environment. RNG's use offsets the need for fossil natural gas. Producers of RNG are able to sell it at a premium above what fossil natural gas is worth due to many state-mandated, sustainable energy portfolios. State legislatures in Minnesota, Colorado, and Oregon are proactive in passing laws that encourage RNG development within their borders. Agricultural states across the Midwest have an incredible opportunity to secure a domestic source of environmentally friendly energy, while simultaneously giving their farmers another commodity that they can sell.

149. *Id.*

150. See SIRICHAJ KOONAPHADEELERT ET AL., *BIOMETHANE: PRODUCTION AND APPLICATIONS* 163-78 (2020).

151. *Id.* at 164-65.

152. *Id.*

153. *Id.* at 167-69.