Spire Missouri Inc. Attachment 1
Responses to Staff's July 26, 2023 Request for Comments

Renewable Natural Gas Program

1. Should the Commission adopt separate rules regarding renewable natural gas (RNG) for biogas, hydrogen, and gas derived from waste CO2? Please explain your reasoning.

   There should not be separate rules for the cost recovery of investments or procurements of the various types of renewable natural gas. The Commission should seek to find a reasonable path that protects customers but also allows the utilities flexibility to respond to dynamic changes and advancements.

2. Are there, or should there be, separate classifications of RNG facilities based upon feed stock (i.e. agricultural applications, landfill collection, etc.)? If so, how should those be defined?

   Again, for cost recovery, no. However, for gas quality specifications, separate rules may be warranted.

3. Section 386.895.2. RSMo states: The commission shall adopt rules for gas corporations to offer a voluntary renewable natural gas program.

   a. Does this statute authorize, but not require, a program applicable to customers who volunteer to participate?

      No, that is not the purpose of this legislation. The legislation is not required for utilities to bring forth voluntary customer programs for the Commission to review, including those related to RNG.

   b. Does this statute authorize, but not require that utilities offer a program to generally inject biogas into the gas supply, the costs of which are borne by all customers of that utility whether or not a given customer volunteers to participate?

      Yes. The legislation encourages utilities to procure renewable natural gas or make qualified investments in RNG for the benefit of all customers. There are benefits to all Missouri utility customers when utilities either invest in RNG production infrastructure or infrastructure that allows other RNG developments to move gas onto the utility distribution systems. However, the benefits are not necessarily limited to utilities and their customers. Benefits can accrue to municipalities, the agricultural community, and other Missouri businesses in our operating areas by providing additional income streams,

lowering barriers for project development, and generally promoting localized environmental benefits.

4. Section 386.895.5. RSMo allows recovery of prudent, just, and reasonable qualified investment costs.

    a. What factors should the Commission consider in determining prudence?

    The Commission should apply the same prudence standard it uses for evaluating utility actions in other instances, which considers the facts and circumstances available to the utility at the time of investment or procurement and, without the benefit of hindsight, whether a reasonable person would have made the same decision. See response to 4.b. below for some possible specific considerations.

    b. How will prudence be demonstrated prior to recovery?

    The existing framework for determining prudence can be used as well as examining the facts of each investment or purchase agreement. This has served as a guide in assisting the Commission and Staff with determining prudency in the past and there is no reason why that should not be the case regarding RNG program expenditures. While not exhaustive, the following are considerations that Spire believes are relevant when evaluating the prudence of RNG expenditures. First, the various impacts to customers will be considered and evaluated, including costs versus economic benefits, supply diversity and resilience, and environmental benefits. Second, the expected output from production assets will be weighed against the costs to obtain that output, including the avoided costs of not having to purchase those volumes. Third, behind the gate availability of gas and the ability to support our system with these additional resources is also a factor Spire will consider when reviewing projects to pursue. Having a reliable, balanced portfolio that mitigates upward natural gas price spikes is a practice encouraged by Commission Rule 20 CSR 4240-40.018.

    c. Should prudence be determined in the rate adjustment mechanism (RAM) case, rate case, or some other or combination of cases?

    Prudence should be determined in the specific case rate changes are sought. For qualified investments, this could be in a general rate case, or in a RAM case if the qualified investment is placed into service between general rate cases as allowed by the legislation. This will limit the duration of regulatory uncertainty which will benefit the utilities and any related project partners. Prudence of procurements of RNG should be determined in PGA filings.

d. How will prudence be determined for a voluntary program that is likely more costly than the traditional alternative and without a state or federal supply mandate?

First, the Commission's review of prudence must consider the purpose of the legislation, which is to promote investment in RNG infrastructure by both utilities (qualified investments) and non-utilities (procurement). Second, when the broader market evaluates RNG, there are two components considered: the gas molecule and the environmental attribute associated with the production of that molecule. The gas molecule is viewed as being interchangeable with geological natural gas as the biogas has been conditioned to match the pipeline gas quality specs.[1] The environmental attribute is a separate asset that can be bought and sold into different markets, which are discussed below. The ability to buy and sell the components together or separate provides flexibility for the utility to benefit the customer. As discussed above, it's also important to consider the benefits beyond the cost paid per MMBtu for renewable natural gas, such as system resiliency and price mitigation.

Spire would point out that there are many instances where more costly options of energy have been deemed prudent for decades at the MPSC, specifically for electric generation and dispatch for Missouri regulated electric utilities. Hydro, pump storage, natural gas, oil, nuclear, and coal generation costs have been recovered by vertically integrated MO electric companies for decades, and each type of generation listed above has a different cost to produce a unit of electricity. The Commission has deemed prudent generation sources that are more costly than what has been considered the traditional alternative. The Missouri regulation mindset must also change on gas procurement as new sources of natural gas become available. Regulation of electric generation shows that there is a path to evaluate prudence without solely focusing on obtaining the lowest cost resource. The gas market and customer expectations are changing: environmental components are important to customers, we have seen several polar vortexes in the past decade causing significant price spikes and strain on infrastructure, and for the next several decades, we will be seeing a shift to renewable generation which will put further strain on the natural gas supply and infrastructure. We have seen $200 to $600 per MMBtu from traditional supply sources. If a utility's decision in RNG supports customers, is benefiting the state or environment, helps with resiliency or reliability, and may cost more than a traditional alternative, then all of those components need to be taken into consideration to determine prudency.

[1] https://www.rngcoalition.com/rng-qa

e. What factors should the Commission consider in determining the justness?

Historically, when the Commission reviews whether a utility's service or rates are just and reasonable, a statutory requirement, the Commission utilizes the prudence standard, which is discussed above.

f. Should justness be determined prior to recovery?

Yes, the Commission should review whether a cost is just and reasonable prior to recovery, which requires an analysis under the prudence standard and takes into the considerations Spire has highlighted above.

g. Should justness be determined in the RAM case, rate case, or some other or combination of cases?

Whether a cost is just and reasonable should be determined in the case where the Company requests recovery of such cost.

5. What should be included as the minimum filing requirements for a RNG application?

The minimum filing requirements should depend on the type of project or cost for which recovery is being requested. The requirements generally should include a description of the project, the project costs and timeline, how and when project costs will be recovered, rate impacts and cost allocation, and feasibility of the project.

a. Should all applications include a demonstration that each Tartan criteria has been met?

The Tartan criteria, which are only policy guidelines for the Commission, should not be required as these criteria will not be applicable to every RNG project.

6. In the workshop discussion, it was noted that some biogas facilities would generate the most biogas in summer months. However, much of the energy consumption would occur in winter months, especially for residential customers. How would a hypothetical RNG program match fuel consumption with actual fuel production?

For investments made by Spire in RNG production infrastructure or in assets connecting to a developer's project, we will consider our system's capabilities and needs during the non-peak months to determine the impacts and best uses of the gas molecules coming onto our system. Some projects will not be pursued if gas needs and pressures do not meet our load requirements and capabilities.

7. What credits or certificates should be used to track volumes of RNG generated?

There are two components to RNG, the gas molecules generated and the environmental attribute associated with the production of those molecules. The gas molecule is viewed as being interchangeable with geological natural gas as the biogas has been conditioned to match the pipeline gas quality specs. The environmental attribute is a separate asset that can be bought and sold into different markets. The two pieces can be sold together, or they can be separated. These distinctions are important to consider and are relevant to the questions below.

When utilities invest in production or interconnect related assets, there will be extensive engineering analysis to estimate the volume of natural gas produced and expected to be brought onto the pipeline. There will also be metering that occurs so the volume of gas brought onto the system will be known and measurable.

The responses to the questions below will focus on the environmental attribute component generated when RNG is brought onto a system and the necessary certification processes have occurred.

a. Are there current certification/crediting processes already in use, or should a certification specific to Missouri be developed? Please provide as much detailed information as possible regarding the certification/crediting process currently in use.

There are two general markets for the environmental attributes associated with RNG: compliance and voluntary markets. The common compliance markets center around the California Low Carbon Fuel Standards (LCFS) market and the Federal Renewable Fuel Standard (RFS) which uses the EPA Renewable Identification Number (RIN).[2] The RINs are grouped into different categories: D3 through D7. The distinction is based on the source of the feedstock with generally more value placed on D3 and declining value to D7.[3]

The voluntary markets are different in that the purchasers in this market are not trying to satisfy any required legal compliance obligations, but rather, are trying to limit or offset the emissions from their operations of their own volition to satisfy their own ESG goals or to meet targets specified by

[2] See the following RNG Coalition address for a high level comparison between the LCFS and RFS compliance markets: https://static1.squarespace.com/static/53a09c47e4b050b5ad5bf4f5/t/649b06847bd2b726eb871e6c/1687881348300/LCFS+RFS+Comparison+in+2023.pdf

[3] https://www.epa.gov/renewable-fuel-standard-program/overview-renewable-fuel-standard

companies they do business with. For the voluntary market, RNG related EAs are typically marketed and purchased as Renewable Thermal Certificates (RTCs) which represent the environmental benefits of one dekatherm, or MMBtu, of RNG that has been injected into the grid.[4] The delivery via displacement system is similar to Renewable Energy Certificates (RECs) used for tracking and delivering renewably sourced electricity. Third-party registries play a key role in issuing, tracking, and delivering the EAs. A common registry utilized is M-RETS.[5] This process gives buyers claim to the benefits associated with their RTC purchase and also ensures transparency and integrity in the process. This prevents double counting of the environmental claims.

The attributes for all of these markets can only be generated when the generated gas has been brought into a pipeline.

b. Please describe the current or proposed certification process, how ownership of credits is derived, and existing markets for RNG credits.

In each production investment project, Spire will evaluate the attribute generation that maximizes value to the utility and its customers. There are factors to consider such as the feedstock source, volatility of markets, duration of contracts for the sale of attributes, and any regulatory requirements.

See the links listed below for further information on the respective compliance and voluntary market certification processes and lifecycles. Generally, there are data collection requirements, review and certification by third parties to meet the required criteria, pipeline injection of the biogas produced, and then finally applications are filed with the respective certifying agency to generate the environmental attributes from that agency (i.e. a RIN, RTC, etc.).

<u>Compliance Market</u>
RFS/RIN[6] - Please see the EPA website reference for a description of the RIN lifecycle, transactions, and market participant information.

[4] https://www.mrets.org/m-rets-renewable-thermal-tracking-system/
[5] https://www.mrets.org/about/mission-vision-values/
[6] https://www.epa.gov/renewable-fuel-standard-program/renewable-identification-numbers-rins-under-renewable-fuel-standard

LCFS[7] - Please see the CARB website reference for a description of the LCFS credit lifecycle, transactions, and market participant information.

Voluntary Market

RTCs[8] - Please see the M-RETS website reference for a description of the RTC lifecycle and certification details.

c. Do RNG credits expire? If so, please provide citations to regulations of the various credits including timeline from development of a credit to expiration.

Compliance Market
RFS/RIN[9] - "RINs are only good for satisfying obligations for the current compliance year or the following compliance year… After that, the RINs 'expire' or can no longer be used for compliance purposes."

LCFS[10] - "LCFS credits do not expire and any surplus of LCFS credits can be banked for future compliance."

Voluntary Market

RTCs[11] - RTCs do not expire.

d. Which entities will be credited with the renewable attributes (i.e. credits) of RNG within an Investor Owned Utility RNG program? Will those renewable attributes be transferrable?

For EAs obtained through production investments or received from developers as part of an interconnect agreement, Spire will evaluate the value of those EAs and the potential uses for them. There are three potential uses identified: 1) Sell the attributes and reduce the cost of the project, 2) sell the attributes and share the revenue with customers as in an off-system sale, 3) or retire the attributes on the utility/all customers' behalf. If the utility sells the EAs, that eliminates the ability of the utility to claim the environmental benefits, however, the local, economic benefits and enhancement of fuel security can still be touted and are a very real part of these projects.

[7] https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard/lcfs-credit-generation-opportunities; https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard/lcfs-registration-and-reporting
[8] https://www.mrets.org/m-rets-renewable-thermal-tracking-system/
[9] https://www.epa.gov/renewable-fuel-standard-program/renewable-identification-numbers-rins-under-renewable-fuel-standard
[10] https://www.law.berkeley.edu/wp-content/uploads/2019/12/Fact-Sheet-LCFS.pdf
[11] https://www.mrets.org/m-rets-renewable-thermal-tracking-system/

e. What entity will be responsible for running and tracking the RNG credit system?

As mentioned above, the EAs are registered with a certifying institution/agency (LCFS, RFS, M-RETS, etc.) which creates a unique ID for the attributes generated. For production scenarios, the creation, retirement, and or sale of these attributes on a given registry can be managed internally using in-house resources or the aid of a third parties could be used. The project complexities and intended attribute registry could impact the level of third-party involvement. For procurement and or interconnect scenarios, the developer may manage the initial registry of the attributes and then the utility or third party can manage any subsequent sale or retirement. It is expected that utilities will gain experience with each project and procurement agreement and that could impact the level of outside involvement needed over time.

f. How should sales/transfers of RNG credits be handled?

i. What mechanism is appropriate to return those revenues to ratepayers or participants?

This should be flexible, project, and maybe even utility specific. There are multiple ways this can be handled in ways that benefit the customer. Assuming the utility actions are deemed prudent, just, and reasonable, there can be different paths examined based on the nature of the project (production asset, interconnection, procurement). For example, in a RAM for a production asset, the sale of EAs may be undertaken to reduce the production cost of the gas; the sales could go 100% to reduce the cost or to some lesser percent if deemed prudent, just, and reasonable. Non-production related EAs acquired can be sold and proceeds could be split based on an existing off system sale. In that case, the savings ultimately flow into the PGA. In either scenario, a utility may choose to hold on to EAs when appropriate to optimize the value of those assets. No matter which path is chosen, the ratepayers should expect to benefit from the sale of those attributes either in the form of a reduction of the filed RAM or through lower PGA costs.

g. Should RNG credits expire? If so, when?

See the response under part 7.c. The registries the EAs were created under determine the life of the attribute if not retired or sold.

8. Please provide detailed explanations of the economics of current RNG facilities.

a. What are the primary revenue streams that support these facilities?

The revenue streams from non-utility owned RNG facilities come from the sale of both the biogas generated and the related environmental attributes. As discussed in section 7, there are different markets and other factors that impact the value of the environmental attributes. Feedstock, duration of contracts, market fluctuations, legislation/regulation all impact the value of the environmental attributes. As gas distribution companies, Missouri utilities may want to retain the gas and thus would not generate revenue from that component. However, based on the specific project, a sale of the EAs may be part of the plan to make that project prudent, just, and reasonable in the eyes of the utility, regulators, and ratepayers.

i. Please provide detailed estimates, with citations to the extent possible, of the market value of various products.

There are different markets and other factors that impact the value of the environmental attributes. Feedstock, duration of contracts, market fluctuations, legislation/regulation all impact the value of the environmental attributes. Many transactions are completed outside of a public registry, making public pricing data difficult to determine. In reviewing pricing by other utilities for voluntary programs, the range in the additional EAs varied between $10-$35 per MMBtu. The price range is impacted by the factors listed above. Price discovery can happen through a utility's RFP process.

See the links below for some price indicators as well:

American Biogas Council Estimator[12]

EPA RIN Sales[13]

b. What equipment is necessary to construct a RNG facility by fuel source type?

Typically, a digester, upgrade equipment skid, and interconnect are required at any RNG facility to create RNG from a biosolid. Landfills do not require a digester as landfills innately have the same anerobic bacteria present to break down the organic material. The upgrading equipment skid consists of a series of purification devices to remove constituents not allowed by tariff.

[12] https://americanbiogascouncil.org/resources/rin-calculator/
[13] https://www.epa.gov/fuels-registration-reporting-and-compliance-help/rin-trades-and-price-information

This includes H2S, CO2, siloxanes, nitrogen, heavy metals, etc. The interconnect consists of a series of meters, regulators, and a gas chromatograph and is designed similar to any interconnect between an interstate transmission pipeline and a distribution company.

c. What are the ongoing costs of processing RNG to natural gas (NG) pipeline quality by fuel type?

   i. Are there incremental investments/replacements necessary over the life of the facility? Please provide detailed explanations, timelines, and cost estimates for those investments.

   Yes. The two most common styles of upgrade filters, membrane and pressure swings, require replacements ranging from every two years to once a decade. Like any other natural gas facility, all equipment requires regular O&M processes to be in place to maximize the life of the equipment.

d. What are the approximate costs for constructing a RNG facility by fuel source type?

   This is dependent on the existing waste management structure in place and volumes produced. Total RNG upgrading skid facilities can range from $1MM to $100MM, with an average project cost of $17MM given current technology.[14] There continues to be research and development in the RNG production technology which is expected to reduce costs in the future.

e. Is RNG typically stored on-site, and if so, what is a typical storage amount based upon peak monthly production?

   No, RNG is not typically stored on site and is injected into the distribution network with minimal lag time for attribute generation reasons. Traditionally there is no benefit to waiting to capture the credits between seasons, as there is purchasing geologic natural gas in peak vs non-peak seasons.

f. Provide estimates for the cost of pipeline or distribution system interconnection based upon various distances from RNG facilities.

   With the various equipment requirements, redundancies, and sizes of the interconnect site and piping network, Interconnect costs can range between

[14] https://www.rngcoalition.com/rng-qa

$1.0MM to $5.0MM. This does not include the piping from the upgrade skid upstream or the new pipeline downstream of the interconnect to the distribution system.

g. Provide detailed explanations for RNG production quantities by feed stock type?

   i. How does production from RNG facilities for various feed stock types based on variations from normal weather (i.e. colder than normal, warmer than normal, various precipitation levels, etc.)?

      RNG produced from animal manure is affected by weather and is produced in greater volumes as the weather temperature rises. RNG produced from food waste, landfill, or wastewater is not affected by weather (assuming it is not frozen solid upon delivery to digester). Wastewater (WWTP) RNG feed stock can be diluted during flooding events if runoff is included in the affluent at the treatment plant.

   ii. What is the typical variation for gas production (upper bound, lower bound, and confidence intervals if available).

      RNG produced by animal manure and crop waste can be seasonal/cyclical. RNG produced by landfill and wastewater are continuous and modeled as being injected into the distribution system consistently throughout the day. Expected uptime from RNG sources from landfill and WWTP can be upwards of 95%.

   iii. How do various agricultural feed stocks impact RNG production (i.e. poultry, cattle, swine, vegetative, combination, etc.)?

      RNG can be generated just as efficiently using agricultural feed stocks as it can be using traditional landfill or wastewater. Identifying and delivering reliable feed stock suppliers, locations, and travel routes will be the biggest impact to RNG production. Co-digestion is routine in the industry and must be managed like all other traditional digesters for the chemical balance inside the digester. Poultry stands out amongst the agricultural feed stocks as it is comprised of a much higher percentage of solids (litter) than swine or cattle. This may require additional separation equipment, but also produces more fertilizer biproducts to be an additional revenue source for the RNG facility.

h. What safety/security measures need to be installed at RNG facilities and what are the approximate costs for each measure based on facility size?

Spire has standard security measures that it employs at its facilities including access controls, cameras, and monitoring from our security operations centers. All RNG upgrade facilities and interconnect facilities will be fenced in and locked stations that will resemble standard gate & regulator stations Spire operates throughout the state, preventing outside manipulation. These stations will also include bollards to prevent damage from vehicles and are a standard cost Spire incurs with the construction of each facility. Given the level of equipment complexity and the relatively short allowable facility downtime, the focus of our O&M team is on predictive maintenance of the process-related equipment. The maintenance staff will perform a variety of critical daily, weekly, monthly, quarterly, semi-annual and annual predictive and/or preventive maintenance activities to maximize up-time percentage. These preventative measures increase the safety of the operational staff and therefore the customers downstream. We will implement a remote continuous monitoring system (Programmable Logic Controller) to monitor the inlet, intermediate, and outlet biogas qualities to identify and resolve potential issues before they require downtime. Any key performance indicators which attain and/or exceeds 75% of the design setpoint will trigger notifications to the Operations Staff and System Controller, who will have the capability to resolve the alarm conditions. The monitoring and safety measures will impact the yearly O&M cost to the projects.

i. Should a RAM include any tax incentives? Why or why not?

It is reasonable to consider project specific tax implications in a RAM. It is likely the tax considerations played into the demonstration of prudence and reasonableness of the project from an economic perspective. It would be fair to customers to have a "net" rate base impact that considers any tax incentives received.

9. Pipeline quality limits - questions for operators of natural gas transmission and distribution systems:

For questions regarding specifications for natural gas currently delivered into the Spire system, Spire references the quality standards laid out in Tariff Sheets No. 7.2 and 9.14. For questions regarding the specifications for renewable natural gas, Spire references its "Renewable Natural Gas Specifications" sheet provided as Appendix 1. The renewable natural gas specifications are more stringent than those in Spire's tariff sheets, however, Spire may consider a variance depending on the specific project. No variance would allow the renewable natural gas specifications to exceed those set in the tariff sheets.

a. Heating Value
    i. What is the range of heating values of the natural gas your system currently receives? Please provide numerical values, and specify the units (e.g. 950 to 1,200 BTU/dry standard cubic foot, at STP).

    950 BTU/SCF to 1100 BTU/SCF

    ii. In your opinion, what is an acceptable range of heating values if renewable natural gas is substituted for or blended with the natural gas delivered to your system? (If different from the range for the natural gas your system currently receives, please explain the reason(s) for the differences.)

    The same heating values must be met before accepting the RNG into the distribution system.

b. Water Vapor
    i. What is the maximum limit for water vapor in the natural gas currently delivered to your system? Please provide a numerical value and specify the units (e.g. 7 pounds of water vapor per MMcf).

    ≤ 7 lbs/MMSCF @ 14.73 psi and 60°F

    ii. In your opinion, what is a reasonable maximum limit for water vapor content if renewable natural gas is substituted for or blended with the natural gas delivered to your system? (If different from the limit for the natural gas your system currently receives, please explain the reason(s) for the differences.)

    The same limit for water vapor content must be met before accepting the RNG into the distribution system.

c. Impurities

    i. What are the maximum limits for the following listed impurities in the gas currently delivered to your system? Pease provide a numerical value and specify the units (e.g. 1.0 grain of hydrogen sulfide per 100 cf).

        1. Hydrogen sulfide: **≤ 1 grains/100 SCF**

        2. Total Sulfur: **≤ 20 grains/100 SCF**

        3. Oxygen: **≤ 1% O2 by volume**

4. Liquid hydrocarbons: **No water or hydrocarbons at delivery temperature and pressure or at 750 psi and 40°F**

5. Carbon dioxide: **≤ 2% CO2 by volume**

6. Hydrogen: **N/A**

7. Active bacteria or bacterial agents: **N/A**

8. Hazardous or toxic substances: **N/A**

9. Other: **Gas shall be free from any foreign materials such as dirt, dust, gums, iron particles, water, entrained liquids, and other impurities which might render it unmerchantable or interfere with the proper operation of pipelines, meters, regulators or other facilities through which it flows or is used.**

ii. In your opinion, what are reasonable maximum limits for impurities if renewable natural gas is substituted for or blended with the natural gas delivered to your system? (If different from the limits for impurities in the natural gas your system currently receives, please explain the reason(s) for the differences.)

For the following questions, Spire references its renewable natural gas specifications sheet that is attached to this response.

1. Hydrogen sulfide: **≤ .25 grains/100 SCF (4 ppm)**

2. Total Sulfur: **≤ 5 grains/100 SCF (85 ppm)**

3. Oxygen: **≤ 0.05% O2 by volume with variance available per project to .2% by volume.**

4. Liquid hydrocarbons: **No water or hydrocarbons at delivery temperature and pressure or at 750 psi and 40°F**

5. Carbon dioxide: **≤ 2% CO2 by volume**

6. Hydrogen: **≤ 400 ppm H2**

7. Active bacteria or bacterial agents: **N/A**

8. Hazardous or toxic substances: **The gas must not contain Hazardous Substances (including toxic or carcinogenic substances or reproductive toxins) at concentrations (1) which would: (a) prevent or restrict the normal marketing of gas, (b) be injurious to pipeline facilities, or (c) would present a health or safety hazard to Spire employees or the general public and (2) not greater than any limits imposed by applicable Environmental Laws.**

9. Other

   Interchangeability: 1290 ≤ Wobb Index ≤ 1370

   Siloxanes: ≤ 1 ppm Siloxanes Testing not required in cattle, hog, and poultry waste digesters

   Arsenic: ≤ 0.48 mg/m3

   Vinyl Chloride: ≤ 21 mg/m3 C2H3Cl Testing not required in cattle, hog, and poultry waste digesters

   PCBs: None

d. Do you have any additional suggestions related to gas quality limits if renewable natural gas is substituted for or blended with the natural gas delivered to your system?

   Standards should not change between geologic and renewables natural gas as RNG can be upgraded to utility quality specifications.

10. Pipeline quality measurement questions for operators of natural gas transmission and distribution systems:

a. What are your current capabilities for monitoring gas quality of the natural gas transported in your pipeline system?

   Spire requires documentation of natural gas constituents from our upstream suppliers at the custody transfer locations and receives gas quality data directly or via data share at some gate stations.

b. If renewable natural gas is substituted for or blended with the natural gas delivered to your system, which entities(s) should be responsible for monitoring gas quality:

i. The entity delivering the renewable natural gas to your system?

The developer will be responsible for meeting the Spire RNG gas specifications and will be required to show continuous documentation proving this.

ii. The operator of the natural gas system?

Spire also intends to have our own Gas Chromatograph at each interconnect as redundant documentation/monitoring.

iii. Other?

Third party analysis will be required when calibrating the chromatograph equipment in decreasing frequency after commissioning of the interconnect.

11. What differences exist between interconnection at the LDC level versus interstate pipeline level?

There are no fundamental differences between interconnects at the LDC level versus interstate pipeline level. Spire intends to focus on interconnecting to LDC systems.

12. Do you have any further comments regarding specific topics that should be considered in the context of a RNG rule? Please provide as much information as possible and citations for supportive information, if available.

This is a relatively new industry that is still going through technological changes and growth in the number of facilities around the country. The legislation passed by the Missouri legislature demonstrates it views RNG promotion and infrastructure development as an important source of economic development in the state, as both "homegrown" fuel, and an opportunity to realize both the marketable as well as localized environmental benefits of RNG. The Commission should seek to provide companies with flexibility to respond to the ongoing changes and advancements in RNG, while providing transparency to ratepayers with respect to costs and participation requirements. As regulated utilities we understand the construct in which we operate. We view RNG opportunities in Missouri having the potential to be a win for all parties involved: customers, utilities, developers, municipalities, agriculture community, the environment and others.

Hydrogen

1. Is your company or city currently considering projects that would include the use of hydrogen as a fuel?

   Yes.

   a. If "yes", what type(s) of projects are being considered?

      Steam Methane reforming and Electrolysis.

   b. If "yes", is your city or company considering using a hydrogen blended with natural gas, 100% hydrogen, or other?

      Both, dedicated hydrogen systems and blending.

   c. If "yes", are you considering transporting hydrogen in existing natural gas pipelines?

      Yes.

   d. If "yes", are you considering building a dedicated pipeline network for purposes of transporting the hydrogen or hydrogen/natural gas blend?

      Yes.

   e. If "no", is the use of hydrogen as a fuel something that your company or city may consider using as a fuel in the future?

PGA Recovery

1. Is a LDC's purchased gas adjustment (PGA) mechanism impacted by the RNG statute/rule? Why or why not?

   Yes, the PGA is impacted. The legislation states, "A filing by a gas corporation pursuant to the renewable natural gas program created in subsection 2 of this section shall include, but is not limited to: (1) A proposal to procure a total volume of renewable natural gas over a specific period; and (2) Identification of the qualified investments that the gas corporation may make in renewable natural gas infrastructure." Item (1) is a clear legislative example on why this would fall under the PGA. If a company is procuring renewable natural gas over a specific period, then it would fall under the PGA.

2. What are the issues related to PGA sales versus transportation customers (buying their own gas) with regard to RNG injections to the distribution system?

   Transportation customers will not be impacted by RNG procured by Spire and recovered under the PGA, as transportation customers source their own natural gas.