Renewable Natural Gas

Interconnect Project Guidelines (Date Effective 4/3/2020)

ONE Gas' renewable natural gas (RNG) project guidelines outline a structured approach to the technical collaboration processes necessary to understand each stakeholder's requirements and make each biogas development project successful.

The following guidelines will help reduce operational risk for all parties and minimize potential impacts to end-use consumers. This framework includes the following key elements:

- Process for initiating preliminary evaluation
- Process and expectations for interconnect feasibility analysis
- Negotiating the renewable natural gas agreement
- ONE Gas renewable natural gas quality requirements

Overview of RNG Project Interconnection Process

The figure below shows the basic connection process. We recommend the project developer/ producer to engage with ONE Gas at least 18-24 months in advance of the desired in-service date.

Steps to Getting Connected

Preliminary Concept Evaluation

This high-level preliminary concept evaluation assesses gas quality requirements and ONE Gas' ability to receive gas into its system based on the interconnection location and associated system flow capacity.

The developer/producer will initiate a preliminary concept evaluation by contacting ONE Gas to express interest in connecting RNG to ONE Gas' pipeline system, briefly describing the project and requesting a preliminary evaluation. ONE Gas will then provide the developer/producer with its RNG quality requirements[1] and a preliminary concept evaluation form, which will request the following information:

- Proposed facility location and land ownership
- Source of raw gas (wastewater treatment plants, landfill, agriculture, food waste, gasification, etc.)

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1 The goal is to ensure that the RNG is equivalent, from a compositional and interchangeability perspective, to pipeline supplies flowing at the proposed interconnect point.

- Anticipated interconnect pressure
- Temperature
- Interconnect pipe size required
- Anticipated gas quality at the interconnect point (see *ONE Gas RNG Quality Requirements*)
- Information about proposed processing/cleanup technology (including commercial track record, if available)
- Expected RNG production rates (peak anticipated hourly/daily flow rates), including anticipated periods of reduced flow due to expected downtime for maintenance, etc.
- Any RNG expected daily/seasonal variations
- Any other key process variables, such as the ability to aggregate supply, if needed

Once the information has been received from the developer/producer, ONE Gas will review the preliminary concept proposal. The timeline for this process will vary depending upon complexity of the project.

After the review is complete, ONE Gas will contact the developer/producer to discuss the preliminary assessment, which includes:

- Determination by ONE Gas as to whether the project can potentially move forward safely and reliably
- Review of RNG quality standards
- Pipeline capacity assessment
- High-level preliminary interconnection cost estimate
- Confirmation from the project developer/producer to move forward
- Odorization and gas quality monitoring/reporting responsibilities

If both ONE Gas and developer/producer agree to move forward, another meeting will be scheduled to outline next steps and move the project into the second phase. A letter agreement will outline the parties' respective responsibilities during the Interconnect Feasibility Analysis.

Interconnect Feasibility Analysis

An Interconnect Feasibility Analysis (IFA)[2] will be conducted at the developer's expense (unless agreed otherwise) to further assess project feasibility. The IFA will include:

- Engineering assessments
- Preliminary interconnection design and design review
- High-level cost analysis for making the connection to the pipeline system
- Preliminary evaluation of the technical aspects of the project
    - Pipeline materials
    - Pipeline easement requirements
    - Equipment, facilities and layout of the interconnection
    - Flow and seasonal capacity system modeling impacts on the pipeline network as a result of a new source of supply (RNG)
    - Impacts on potential sensitive end-use customers
    - Potential impact of RNG supply influence on therm billing zones
    - Comparative evaluation of existing gas supply composition to establish baseline RNG interchangeability and quality requirements for the project

2 Reasonable cost recovery for the IFA may be required to ensure ratepayers are not subsidizing a project developer's work. In this case, ONE Gas will provide an IFA cost estimate for the project developer to consider.

As part of the IFA, ONE Gas will require more detailed information about the project. The developer/ producer will provide a detailed *RNG Technical Summary* to ONE Gas, conducted under a Non-Disclosure Agreement (NDA).

The *RNG Technical Summary* should include:

- A description of the biomass source, conversion technology and raw gas processing technologies under consideration
- A projected RNG project schedule with planned pipeline interconnection
- Supporting data from reference projects that demonstrate the proposed processing technology is sufficient to meet the pipeline gas compositional and interchangeability equivalency requirements

Executing the IFA does not guarantee acceptance of the project. The project developer/ producer should be aware that having a pipeline nearby does not guarantee that it can be used for RNG injection. The specific pipeline's capacity, network configuration and end-use customer needs must be considered. Not all pipelines have the capacity to receive gas on a routine basis.

Negotiating the Renewable Natural Gas Agreement

Once the IFA is complete and if the interconnect is found acceptable to all parties, ONE Gas and the developer/producer will negotiate a *Renewable Natural Gas Agreement* to address the commercial aspects of accepting gas from the proposed facility. Elements of this agreement include, but are not limited to:

- Interconnect agreement, facilities agreement
- Payment for pipeline interconnection cost(s) and any other ongoing charges
- Supply agreement: delivery obligations (mutually agreeable RNG gas quality specification, expected flow rates)
- Gas pairing agreements (contractual blending, net metering and compensation agreements, if applicable)[3]
- Gas measurement requirements (schedule and periodicity, equipment, sharing of monitoring information and electronic signals, etc.)
- Operation and maintenance requirements (monitoring and measurement equipment maintenance, odorization, heating value adjustment, if needed, and metering equipment maintenance, etc.)
- Facility access agreements
- Gas quality monitoring requirements
- Conditions that impact acceptance of upgraded gas and facility isolation
- Billing and payment terms

After completion of the *Renewable Natural Gas Agreement*, the project can then commence facility construction.

3 Gas pairing agreements allow for contractual blending, where the pipeline operator provides the developer/producer with the option for "pairing" RNG that cannot otherwise meet pipeline requirements, typically for heating value, for a negotiated fee.

ONE Gas Renewable Natural Gas Quality Requirements

It is the developer/producer's responsibility to affirm and demonstrate through comparative analysis that reasonably expected constituent concentrations in the raw gas (based on raw gas analysis and/or similar prior processing experience or prior applicable engineering studies) will be removed and/or limited to concentrations typically found in flowing pipeline supplies at the ONE Gas interconnect location. It is not the intent of ONE Gas to approve the equipment needed to process the RNG stream to ONE Gas' gas quality standards, but to ensure the technology selected is appropriate to meet the gas composition and interchangeability requirements of the interconnect point through periodic gas sample analysis.

The biomass source/raw gas evaluation needs to consider, as appropriate, the constituent classes identified below, as well as the natural gas supply at or near the proposed interconnect point to provide a basis for comparison. Constituent testing, when required, should be done by a mutually agreed upon third-party analytical laboratory service provider using mutually agreeable standard sampling and testing methods.

Kansas Gas Service, Oklahoma Natural Gas and Texas Gas Service currently carry the following limits on constituent classes for meeting ONE Gas' gas quality standards. The second chart lists the required limits on constituent classes associated with RNG. ONE Gas reserves the right to alter the limits as needed in the future.

Constituent Classes	Kansas Gas Service	Oklahoma Natural Gas	Texas Gas Service
Hydrogen Sulfide	4 ppm	¼ g/100 cu	¼ g/100 cf
Total Sulfur	8 ppm	20 g/100 cf	5 g/100 cf
Carbon Dioxide (% by vol.)	2%	2%	2%
Total Inerts (% by vol. including CO_2 and N)		4%	5%
Oxygen	100 ppm	0.2% by vol.	0.2% by vol.
Heating Value (BTU)	950-1100	950-1080	950-1100
Temperature (°F)	25°-120°	120°	40°-120°
Water or Hydrocarbons in Liquid Form	0	0	0
Water Vapor per 1,000 MCF of Gas (lbs.)	7	7	7
Non-Hydrocarbon Gas (% by vol.)			4

Renewable Natural Gas Constituent Classes	Kansas Gas Service	Oklahoma Natural Gas	Texas Gas Service
Mercury ($\mu g/m^3$)	0.19	0.33	0.06
Siloxanes (mg Si/m^3)	0.00	0.36	0.00
Total Measured Halocarbons (ppmv)	3.14	6.92	6.22