



Interconnect Guide for Emerging Fuels into Energy Delivery Networks

Introduction of RNG and HENG

RNG Interconnect Guide Revision

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Future is Upon Us.....

Can We *Reasonably & Rationally*

Meet The Challenges of
The Second “Great Conversion”

- **Policy drivers for low-carbon utilization of pipeline infrastructure**
- **Renewable Gas, including HENG is a reality and an important part of meeting the nations low-carbon energy future**
- **Clean-up /Processing Technology has significantly evolved**
- **Our mutual understanding of real vs perceived concerns has evolved..... AND continues to evolve as we continuously learn from experiences to grow this important resource.**

Revision Team Engagement

Broad Cross-Section of Industry SME's

- Central Hudson Gas & Electric
- Consolidated Edison Company of New York
- National Fuel Gas Distribution
- National Grid
- New York State Electric & Gas (NYSEG)
- Orange & Rockland Utilities
- Rochester Gas & Electric (RGE).
- GTI Energy
- The Coalition for Renewable Natural Gas (RNG Coalition)
- The American Biogas Council (ABC)
- The American Gas Association
- Downstream Natural Gas Initiative (DSI) - M.J. Bradley & Associates
- The Blacksmith Group
- Iroquois Gas Transmission
- NiSource
- REGENIS
- ARCHAEA Energy
- NYSEARCH
- VGS
- PG&E
- SoCalGas

Interconnect Guideline Historical Drivers

Industry Challenges

- No uniform processes, requirements, or agreements
- Commercial and technical uncertainty for both parties

Document Objectives

- Provide a consistent approach to assess the commercial and technical viability of each project without compromising safety or reliability of the pipeline grid
- Define requirements to keep gas flowing and avoid service interruption
- Provide a standardized framework to reduce uncertainty and optimize biogas processing facility design
- Outline a structured approach for use by all parties (both project developer and pipeline operator) of the RNG process
- Lay out roles and responsibilities for each party and what each needs to accomplish

2019 DOCUMENT OVERVIEW.....

- Introduction
- Preliminary Evaluation
- Engineering Services Agreement / Feasibility Analysis
- Gas Sales Agreement (GSA) / Interconnect Agreement
- Feedstock, Pipeline Gas Quality & Safety Considerations
- Facility Operation & Maintenance
- References & Appendices

Appendices..... “The Tools”

- Assessment Process Checklists
 - Provide a worksheet of items to consider when assessing the producer’s technical proposal
- Gas Quality and Interchangeability Management Program Matrix
 - Provide a checklist of items to consider when developing the gas quality and interchangeability management program
 - Optimize gas quality, maximize gas supply, avoid problems with the pipeline infrastructure and/or end-use applications, and ensure consumer health and safety
- Raw Biogas and Upgraded RNG Trace Constituents Measurement Matrix
 - Lists some recommended parameters and their testing frequency for the initial RNG Verification Program
- Feedstock/Upgraded Gas Constituent Guidance Matrix
 - Data on observed ranges of constituents found in upgraded landfills, dairy farms, and wastewater treatment plants (WWTPs)

Lessons Learned - What We Are Hearing

- Incorporation of HENG guidance?
- Interconnect process clarifications?
- Clarification of Table 1 - Gas Quality Considerations?
- Testing / Monitoring / Sampling Methods?
- Trace Constituent Limits of Concern?
- Appendix Materials?
- Tariffs, Receipt Point Specifications, Delivery Point Specifications?



Revision Summary Overview

Title Update

**Interconnect Guide for Emerging Fuels into Energy
Delivery Networks**
Introduction of RNG and HENG

- Expanded description of the intent of this Guide
- Incorporated **Emerging Fuels** terminology throughout where appropriate
- Enhanced explanations of the “why” for the guidance provided
- Updated guidance on various constituents of concern (Table 1)
- Added technical considerations on injecting hydrogen
- Added gas quality blending & pairing agreements

Revision Summary Overview

Appendix Update:

- References – Please suggest any additional Technical References including hydrogen
- Additional Definitions by GTI Energy will be added
- Updated Producer / Pipeline Operator Assessment Process Checklists
- Updated RNG Trace Constituents Measurement Matrix
- Updated Example of Interconnect Feasibility Analysis Agreement (IFA)
- Updated Sample Gas Sales Agreement
- Updated Gas to Grid Process Flow
- Feedstock/Upgraded Gas Constituent Guidance Matrix – Removed PCB's / Pesticides as COC's
- Significant Updates to Observed Ranges Found in Fully Upgraded RNG from Landfills

Revision Summary Overview

Appendix Update Cont'd:

- Significant Updates to Observed Ranges Found in Fully Upgraded RNG from Landfills, Agriculture Sources & WWP's
- Added Appendix to Address Rationale for Eliminating Certain Trace Constituents
- Added Appendix to Provide an Example of Gas Aggregation / Pairing Agreement

General Process Description

PRELIMINARY EVALUATION

Developer contacts pipeline operator & provides preliminary project scope description

- Location
- Anticipated interconnect pressure
- Temperature
- Pipe size
- Heating value and specific gravity
- Amount of gas
- Flow
- Variability in gas delivery
- Biogas source and cleanup technology
- Other key process variables

Preliminary Review Meeting

- Review of ESA and GSA Requirements
- Developer/operator specific needs
- Local, state, and/or federal regulator requirements (includes NYS code 16 NYCRR Part 229 Gas Quality Standards for Pipeline Injection)

ENGINEERING FEASIBILITY ANALYSIS

Developer provides detailed technical proposal to pipeline operator (typically under NDA)

- Description of chosen cleanup gas technology
- Data proving cleanup technology is compatible with upgraded gas feedstock
- Detailed analysis of raw biogas (can be from another project with same feedstock)

Address impact issues on pipeline system and customers

- Examine pipeline capacity during varying load periods
- Zone of influence of trace constituent impact
- Impact on therm billing monitoring

Reimbursement to pipeline operator for full technical and economic feasibility of the project

Making contact with a pipeline operator and executing an ESA does NOT guarantee acceptance of the project

GSA OR INTERCONNECTION AGREEMENT

Commercial aspects of accepting gas negotiated

- Commodity compensation
- Delivery obligations (volume, energy content, pressure, temperature, flow rate etc.)
- Gas pairing agreements (blending)
- 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 and metering equipment maintenance etc.)
- Facility access
- Gas quality monitoring requirements
- Conditions that impact acceptance of upgraded gas and facility isolation
- Billing and payment terms
- Tariff or a special contract for transporting the gas enabling the pipeline operator to facilitate the desired transaction for the Developer if the RNG will be sold to a third party
- Begin discussion of pre-construction questions

CONSTRUCTION/ COMMISSIONING

Pipeline operator must be kept informed on progress of construction and specifications

- Suggested interim meetings at 30%, 60%, 90% project completion points at minimum

Address pre-construction questions

- Facility start-up procedures
- Discussion of odorization
- Final gas quality tariff specifications
- On-line instrumentation needs
- Schedule for monitoring of gas quality
- Identification of sampling points
- Identification of target COCs for periodic monitoring
- Initial sampling requirements
- Follow-up sampling requirements
- Steady state sampling requirements
- Trigger levels for specific COCs
- Response actions for out-of-compliance supply
- Emergency plans and procedures
- Facility O&M procedures



Questions Discussions