Utility RNG Program

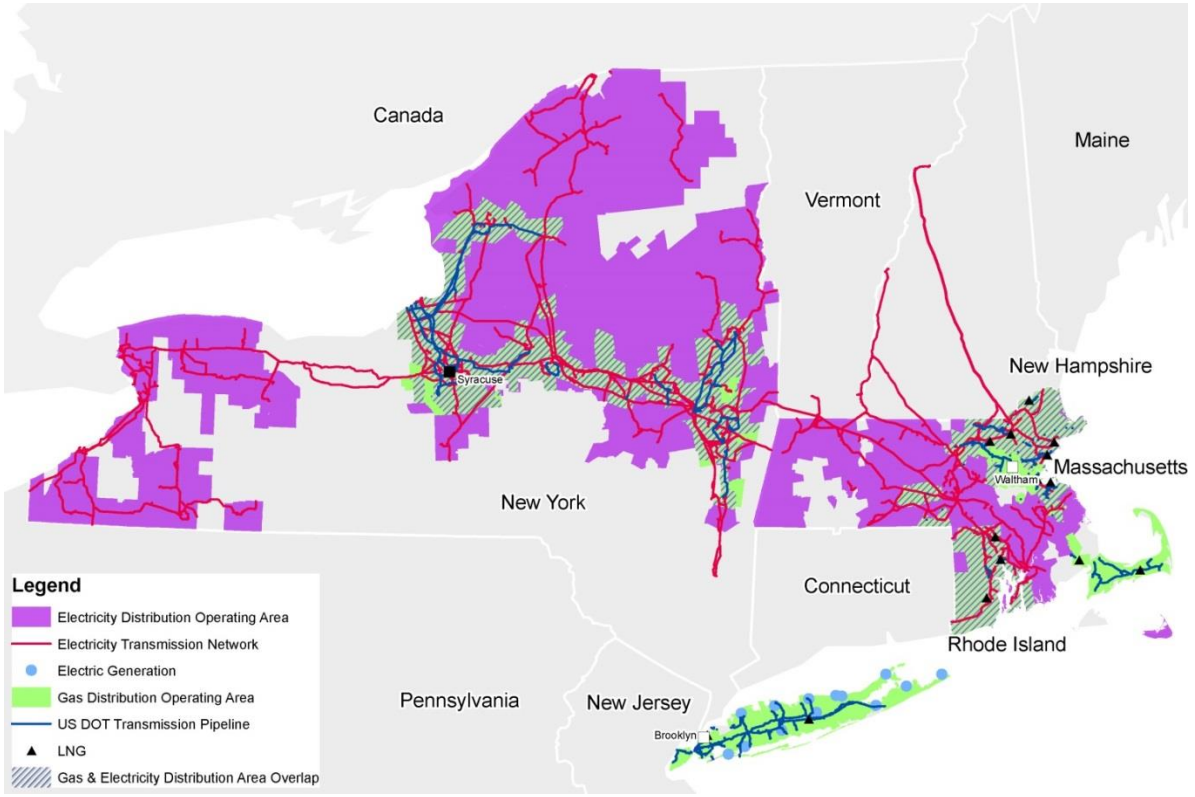
State Interconnection Guideline
Oct 17, 2018

nationalgrid

Agenda

Who We Serve

Gas and electric distribution company providing energy to 20 million customers in NY, MA, and RI



We deliver safe, affordable, reliable and sustainable energy

Our Position on Climate Change is Clear

National Grid supports ambitious regional GHG emission reduction targets in all of the jurisdictions where it has business operations

Region / State	Midterm	2050
Massachusetts	25% by 2020	80%
Rhode Island	45% by 2035	80%
New York	40% by 2030	80%
UK	40% by 2030	80%
National Grid	45% by 2030	80%

A List

Influence Map Climate Policy Engagement 2018

#1 Utility

Newsweek Green Rankings 2016

A List

CDP Climate Change Rating 2017 & 2016

RNG is a Climate Solution for the Gas Network

"The biggest driver of renewable gas is GHG reduction, but what makes renewable gas more compelling is that it also enhances diversity of supply while providing a solution for using local waste resources to produce renewable energy."

-National Grid 2010

*Local supply constraints RNG can provide a "Non-Pipeline Solution" (NPA)






National Grid's RNG Journey

2018 Facilitating interconnection for RNG producers, developing RNG offerings, R&D for new sources

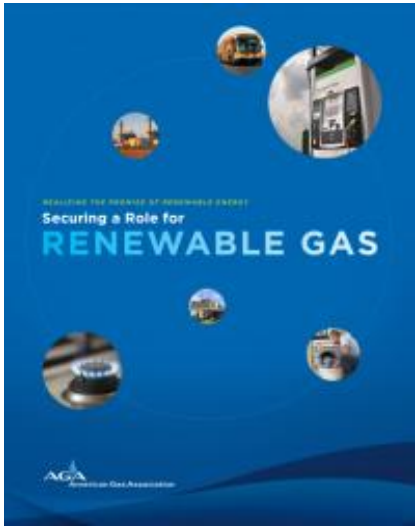
2017 NY Standard Interconnection Guideline

2011 AGF Nationwide RNG assessment

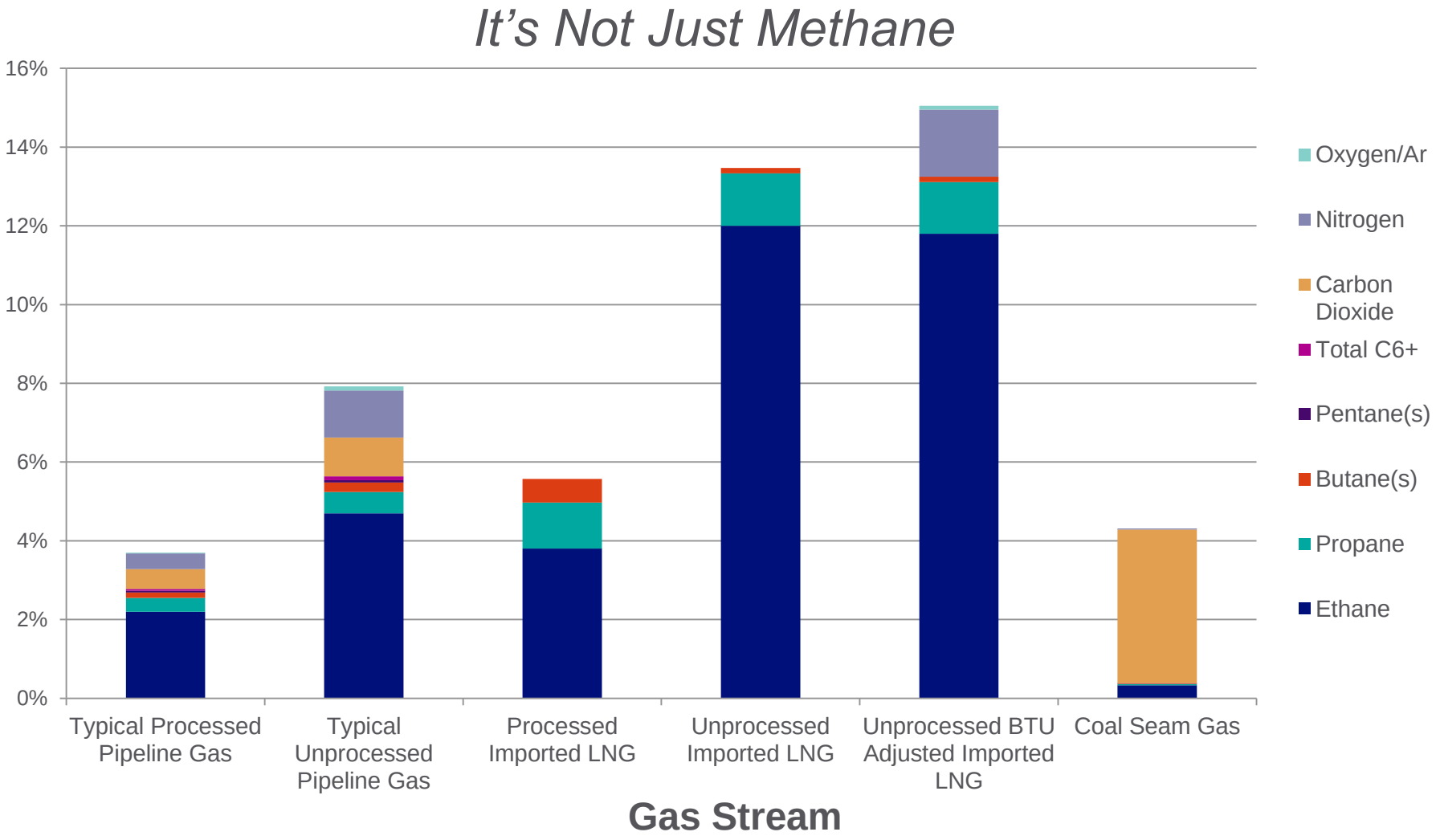
2010 National Grid RNG assessment

2009 Newtown Creek Demonstration Project

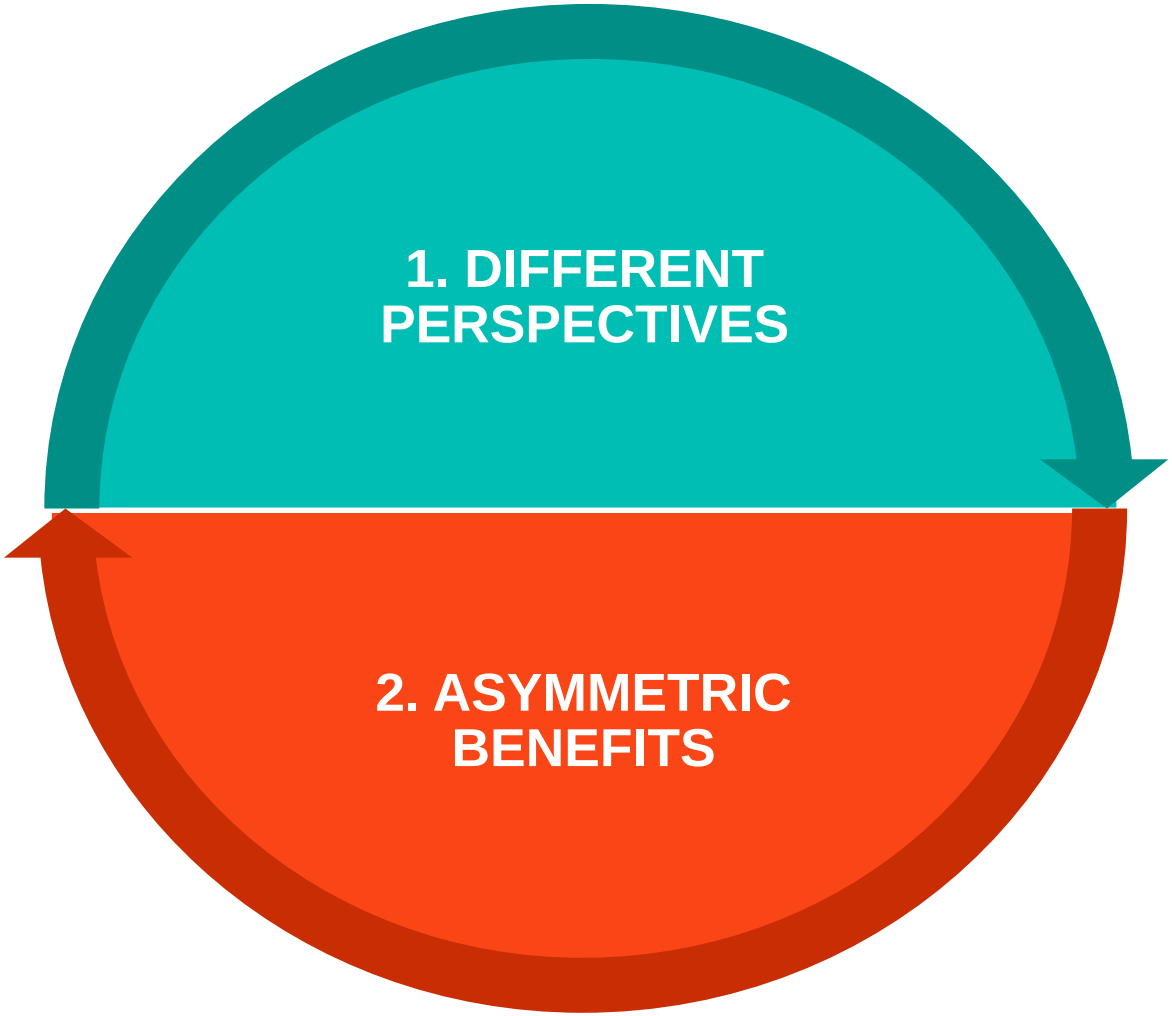
1982 Staten Island Landfill – 1st utility to allow an RNG project to interconnect



Putting it Into Perspective - Traditional Supply Compositions Vary



Utilities Face 2 Key Challenges to RNG Interconnection



LDCs Concerns with RNG Injection

HHV/SG	Therm Billing	Interchangeability
Total Inerts	System Integrity	Interchangeability
Moisture	System Integrity	
Oxygen	System Integrity	Interchangeability
Sulfur Compounds	System Integrity	Safety
Trace Constituents	End Use	Safety
Reliability of Supply	Gas System Supply Balancing	

How to Resolve Concerns

- ✓ Establish trace constituent product equivalency
- ✓ Explore opportunities & common ground
- ✓ Willingness to understand each others concerns & work towards solutions
- ✓ Finding ways to say “yes” rather than imposing overly restrictive requirements based on operational uncertainty

RNG Interconnect Guidance Document

Sponsors

Central Hudson, Con Edison, National Grid, NYSEG/RGE, Orange and Rockland, National Fuel Gas

Project Manager

NGA

Consultant

GTI

External Stakeholders

RNG Coalition

American Biogas Council

Purpose of the Standard Interconnection Guideline

Current Challenges

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

Document Objectives

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

Good Science & Common Sense……

Relationships are Key to Successful Interconnection

- Communication between parties is INTEGRAL to project success
- Parties must collaborate (early) to ensure a reliable, optimal process
- Ideal for both parties to be as transparent as possible throughout the process

PRELIMINARY EVALUATION

Developer contacts Distributor

Preliminary Project Scope Description

- Location (address)
- Feedstock source & cleanup technologies being considered
- Interconnect pressure
- Interconnect temperature
- Expected heating value (BTU)
- Amount and flow of gas
- Deliverability of gas to the LDC (including any daily and seasonal variations)

Distributor Internal Analysis

- Pipe size/length
- Examine pipeline capacity during varying load periods

Preliminary Review Meeting

- Review of interconnection process
- Developer specific needs
- Local, state, and/or federal regulator requirements
- In-person visit to set foundation for open communication

ENGINEERING FEASIBILITY ANALYSIS

Developer provides detailed Technical Proposal (under NDA)

- Description of chosen cleanup gas technology
- Detailed analysis of typical raw biogas for presence of reasonably expected trace constituents
- Assurance that cleanup technology is compatible with upgraded gas requirements based on feed stock and reasonably expected trace constituents

Distributor assesses potential impacts

Determine preliminary interconnect cost estimates

Reimbursement to Distributor for EFA

GSA OR INTERCONNECTION AGREEMENT

Commercial aspects of accepting gas negotiated

- Identification and trigger levels for specific COCs
- Final gas quality tariff specifications
- Schedule for monitoring of gas quality
- Delivery obligations (volume, energy content, pressure, temperature, flow rate etc.)
- Gas pairing agreements (blending)
- Gas measurement requirements
- Operation and maintenance requirements
- Facility access
- Conditions that impact acceptance of upgraded gas and facility isolation
- Billing and payment terms
- Tariff or a special contract for transporting the gas

COMMISSIONING

Distributor must be kept informed on progress

Interim meetings at 30%, 60%, 90%

Address pre-construction questions

- Facility start-up procedures
- Identification of sampling points
- Initial sampling requirements
- Follow-up sampling requirements
- Steady state sampling requirements
- Response actions for out-of-compliance supply
- Emergency plans and procedures
- Facility O&M procedures

Interconnect Process Visual

PRELIMINARY EVALUATION

Developer contacts Distributor

Developer provides Preliminary Project Scope Description

- Location (address)
- Feedstock source & cleanup technologies being considered
- Cleanup system interconnect pressure
- Cleanup system interconnect temperature
- Expected heating value (BTU) of cleaned biomethane
- Amount and flow of gas (in dth/hr, scf/hr or BTU/hr)
- Deliverability of gas to the LDC (including daily and seasonal variations if any) and compositional changes

Distributor Performs Internal Analysis

- Pipe size/length
- Examine pipeline capacity during varying load periods

Preliminary Review Meeting

- Review of interconnection process
- Developer specific needs
- Local, state, and/or federal regulator requirements (includes NYS code 16 NYCRR Part 229 Gas Quality Standards for Pipeline Injection)
- Set foundation for open communication with in-person visit, when possible

ENGINEERING FEASIBILITY ANALYSIS

Developer provides detailed Technical Proposal to Distributor (typically under NDA)

- Description of chosen cleanup gas technology
- Detailed analysis of typical raw biogas (site specific or other similar facility already in operation) for presence of reasonably expected trace constituents which may impact pipeline safety/integrity, and consumers
- Assurance that cleanup technology is compatible with upgraded gas requirements based on feed stock and reasonably expected trace constituents.

Distributor assesses potential impact on pipeline system and customers and various internal stakeholders

- Distributor to model zone of influence of trace constituent impact
- Impact on therm billing monitoring
- Works with internal stakeholders (Gas Control, Engineering, Planning, Legal etc) to assure all Distribution Company stakeholders have a complete understanding of the project

Determine preliminary interconnect cost estimates considering all stakeholders

Reimbursement to Distributor for full technical and economic feasibility of the project

GSA OR INTERCONNECTION AGREEMENT

Commercial aspects of accepting gas negotiated

- Identification and trigger levels for specific COCs based on constituent equivalency to typical gas flowing within the distribution system at the connection point
- Final gas quality tariff specifications
- Schedule for monitoring of gas quality
- 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 (gas quality monitoring and measurement equipment maintenance, odorization and metering equipment maintenance etc.)
- Facility access
- 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 Distributor to facilitate the desired transaction for the Developer if the RNG will be sold to a third party

COMMISSIONING

Distributor 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 (can be determined in Gas Sales Agreement discussions and executed in Commissioning)

- Facility start-up procedures
- Identification of sampling points
- Initial sampling requirements
- Follow-up sampling requirements
- Steady state sampling requirements
- Response actions for out-of-compliance supply
- Emergency plans and procedures
- Facility O&M procedures

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