

# Gas Quality & Interchangeability

*Can we make Renewable Supplies "Fit the Pipe"*

**Government/Industry Pipeline R&D Forum - June 2009**

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# Can We *Reasonably & Rationally* Meet The Challenges of The Second “Great Conversion”



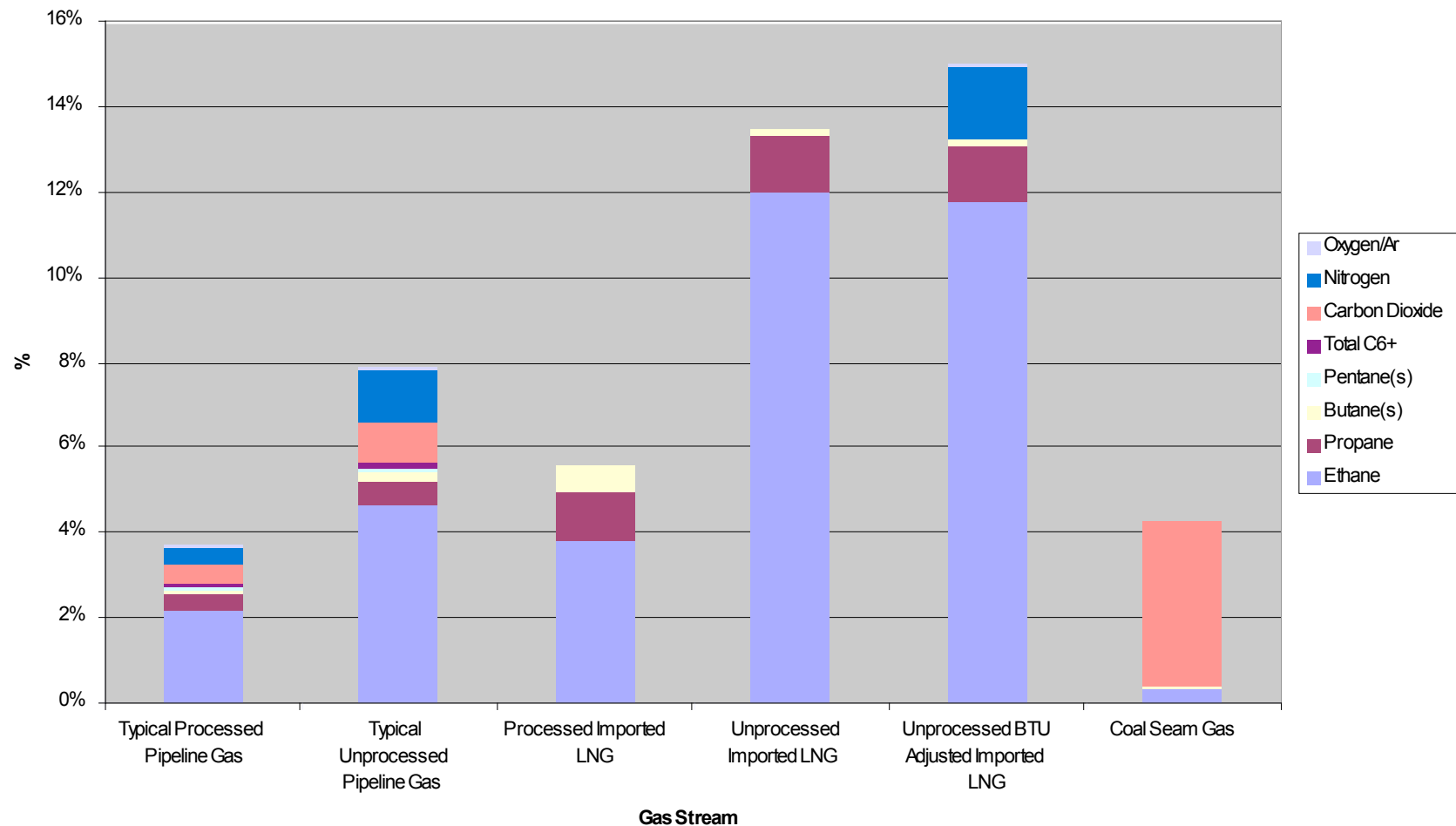
A purge burner igniting manufactured gas being replaced in a main by natural gas during the 'great conversion' in 1952

- Supply Mix Is Changing.....
- LNG Imports Will Play A Major Role
- Renewable Gas, Shale Gas etc.....
- End-use Technology Has Evolved
- Begg The Question....

*Is Yesterdays Research Sufficient To Examine Today's Challenges ??*

# How Do Supply Compositions Vary?

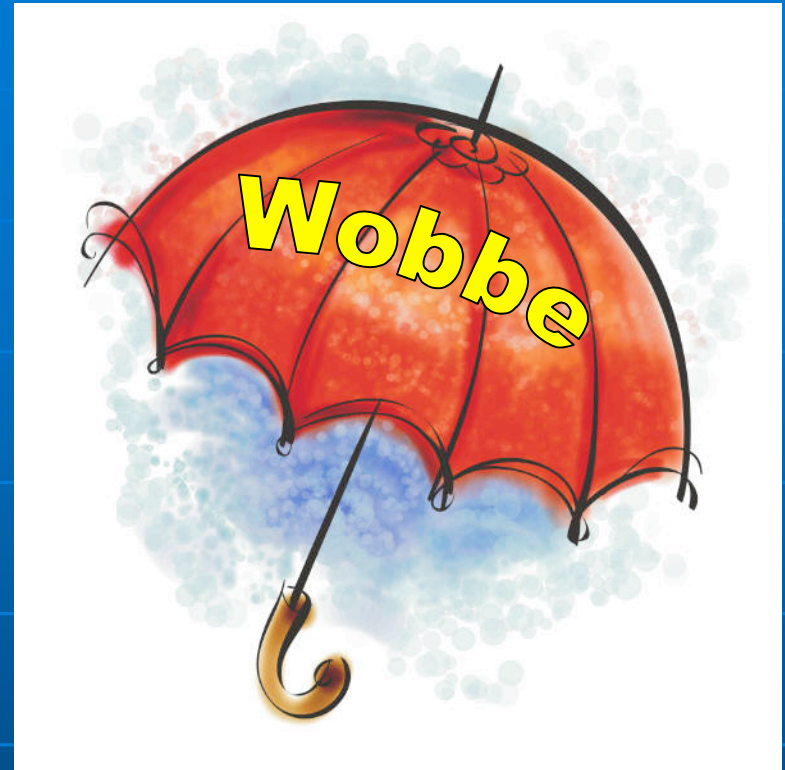
*It's Not Just Methane!*



# Did The White Paper Help ???

## Interim Guidelines Include:

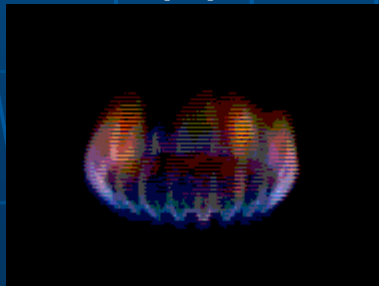
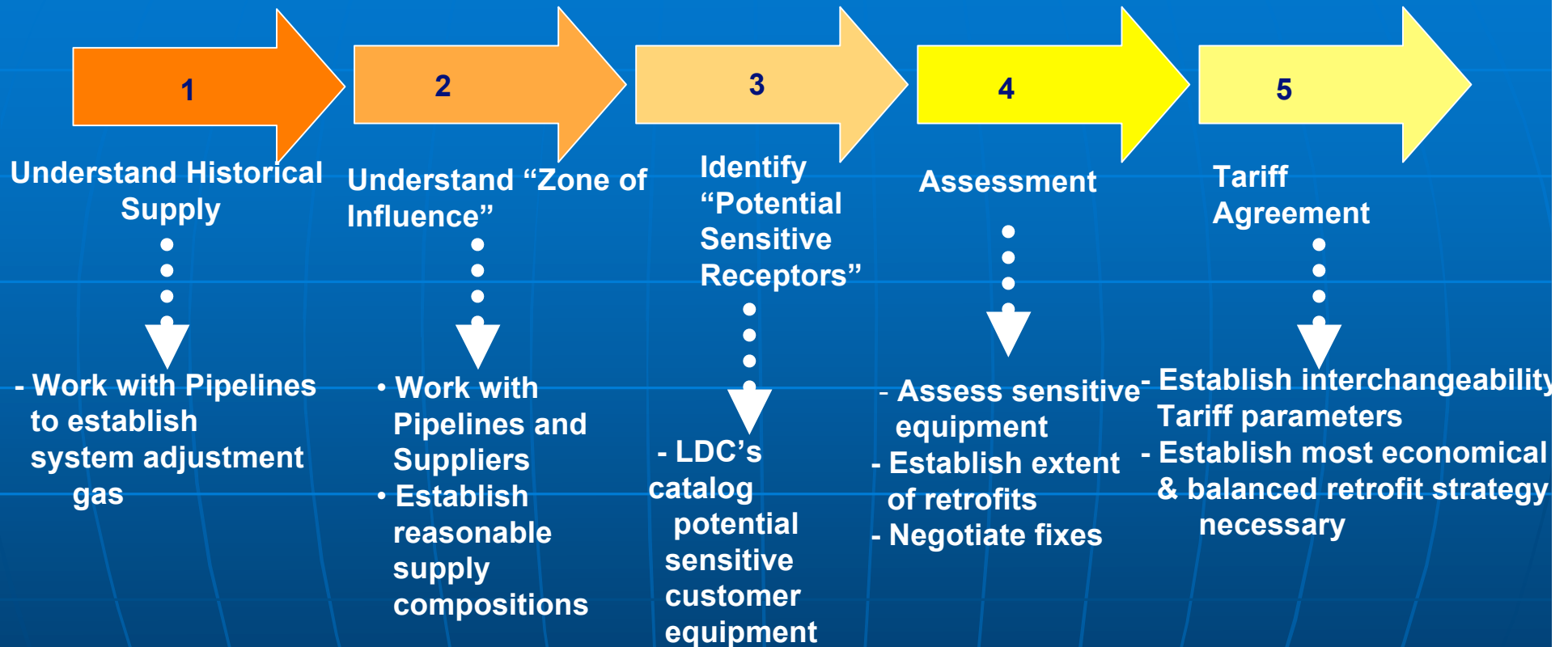
- Historical Wobbe +/-4%
  - Capped at 1,400 + 1,110 HHV
  - Butanes+ 1.5 %
  - Total Inerts 4 %
- *Wobbe Alone May Not Be The Answer !!***



# FERC Policy Statement .....

1. Only natural gas quality specifications contained in a FERC approved tariff can be enforced
2. Pipeline tariff provisions on gas quality need to be flexible
3. Pipelines & customers should develop gas quality specifications based on sound technical engineering and scientific considerations
4. Pipelines & customers **STRONGLY ENCOURAGED** to use the NGC+ White Paper & Interim Guidelines as a common scientific reference point
5. Unresolved disputes brought before FERC will be resolved on a case by case basis with significant weight given to the NGC+ white paper.

# Interchangeability Implementation Process



# Utilization Considerations

## *Real or Perceived ?*

- Appliances
- Power Generation - DLE Gas Turbines
- Vehicle & Stationary Engines
- Infrastructure Issues
- Feedstock Applications Including LNG Liquefaction  
Peak Shavers

# National Progress.....

- ✓ AGA Report 4A Revision
- ✓ New Appliance Research
- ✓ NYSEARCH In-Service Appliance Research
- ✓ NYSEARCH Infrastructure Research
- ✓ GTI Biomethane Guidance Document



# Resulting Northeast Settlement Proposal Under Consideration *Taking a “Fresh Look”*

- **Wobbe & HHV Capped at 1400 / 1110**
- **Non-methane Hydrocarbons 12% (C4+ capped at 1.5%)**
- **Total Diluents 2.75% (Oxygen + Nitrogen with Oxygen capped at 0.2%)**
- **Total Inerts & Diluents 4% (CO2 capped at 2.0%)**
- **CHDP 15F Equivalent**
- **Appropriate Tariff Language to afford us all the certainty and flexibility we need to maximize supply while minimizing end use impacts.....**

# Northeast Regional Pipeline Tariff Progress

- ✓ IGT Uncontested Settlement
- ✓ AGT Settlement
- ✓ Maritimes Northeast Settlement
- ✓ Texas Eastern In-Progress

# Lessons Learned From Recent FERC Decisions

- FERC has recognized that the *NGC+ White Paper* needs to be considered – not simply the interim guidelines  
*Don't forget Recommendation #10 !!!*
- *Stop whining* unless your directly connected to the pipeline under consideration
- ***MUST SHOW IMPACTS BASED ON SOUND ENGINEERING and DATA..... No "What if's"***
- ***End Use retrofit cost recovery is not within FERC's jurisdiction***

# Implementation Experience & Summary

## *The Practical Side of Getting it Done.....*

- Work collaboratively with Pipelines & Suppliers to establish appropriate tariff requirements based on the **“five step process” & NGC+ White Paper Guidance**
- **KNOW YOUR ADJUSTMENT GAS !!**
- Review & Understand FERC’s Policy Statement
- Make sure you are talking to your supplier.... your OEM and that you are collecting data today you will need for *tomorrow*.....

# ***Let's Focus on AGA Report 4A***

Prepared by the Transmission  
Measurement Committee (TMC).....

*AGA Report 4A provides general  
definitions, language and criteria to  
consider when specifying measurement &  
gas quality parameters typically found in  
contracts & tariffs*

# Revision Team Mission:

*Develop & recommend revisions to AGA Report 4A considering recent industry developments regarding gas quality & interchangeability including the NGC+ White Papers & lessons learned during the NGC+ process.*

# AGA Report 4A Summary

## Constituents Considered:

- Hydrocarbons
- Water Vapor
- Hydrogen Sulfide
- Mercaptans
- Total Sulfur
- Carbon Dioxide
- Nitrogen
- Total Inerts
- Oxygen
- Other Trace Constituents

## Parameters & Other Considerations:

- Heating Value
- Specific Gravity
- Temperature
- Hydrocarbon Dew Point
- Interchangeability & Wobbe Number
- Measurement & Analysis (mass, volume, energy)

# Renewable Gas Additional Research Opportunities.....

- Trace Constituent Analysis – National Profile
- Pipelines – sensor development, trace naturally occurring mercaptans
- Constituent impacts on plastic pipe



# SUMMARY

- Recognition & Implementation of the **White Paper, not simply the interim guidelines** will help bridge the trust gaps....
- **KNOW YOUR ADJUSTMENT GAS !!**
  - Work collaboratively with impacted Pipelines & Suppliers to establish appropriate tariff requirements based on the **“five step process”**
  - Settlement Agreements must consider both downstream and upstream effects on long haul systems & potential impacts with interconnecting pipelines, storage facilities as well as reasonably anticipated new supplies