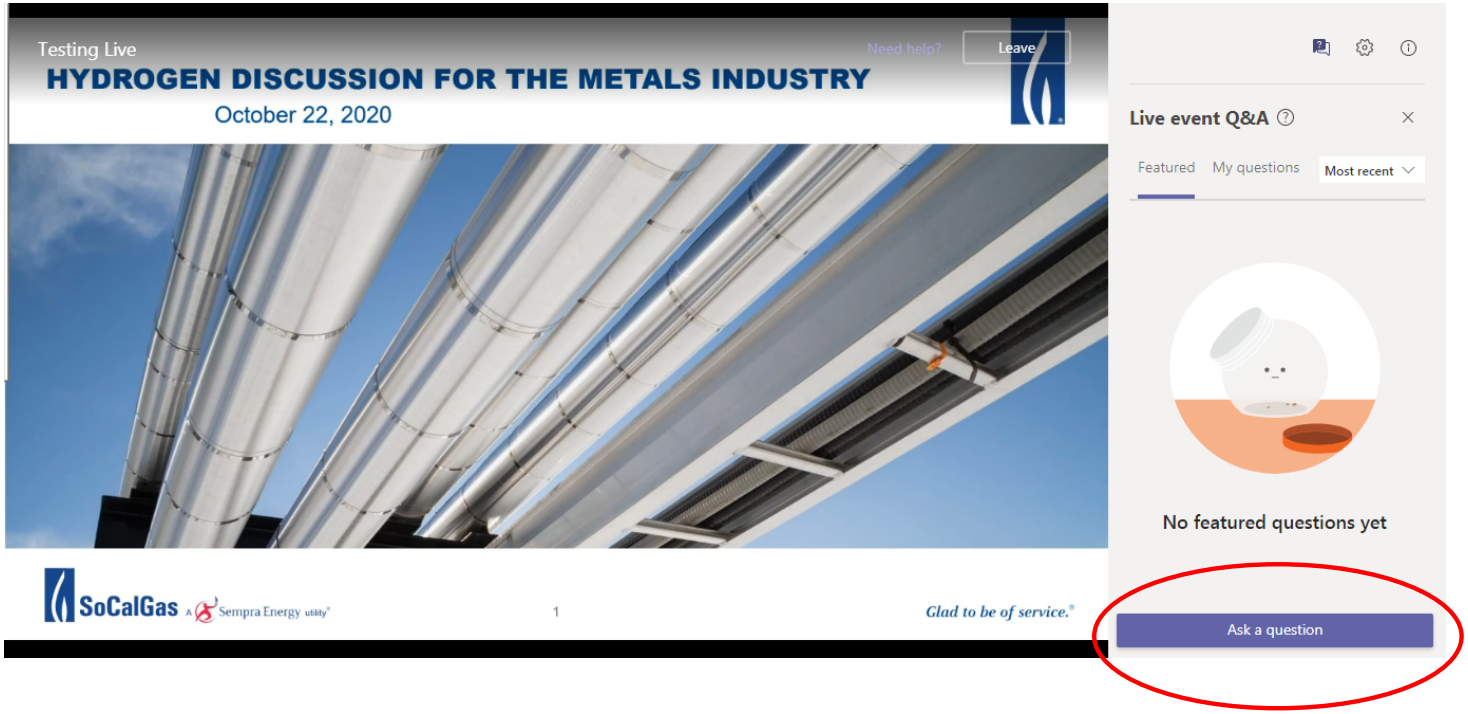
HYDROGEN DISCUSSION FOR THE METALS INDUSTRY

October 22, 2020

Discussion Session

Please share your questions and concerns with the SoCalGas Hydrogen Engineering Strategy Group and Engineering Analysis Center using the Q&A feature on the right of your screen.



Agenda

- Acknowledgement of Customer Questions to Date
- SoCalGas Overview of Hydrogen Blending Efforts to Date
  - Regulatory Update
  - Hydrogen Blending Demonstration Program
  - Research Update

- Customer Led Discussion with SoCalGas Engineering Team
  - Share your Additional Questions and Concerns

General Questions

- What are the hydrogen mixtures being proposed?
- Have any end use customers been involved in studies?

Hydrogen Blending Efforts
Regulatory Update

- SoCalGas, SDG&E, PG&E, and Southwest Gas (the IOUs) are filing an application with the California Public Utility Commission on November 21, 2020
- No Preliminary Hydrogen Injection Standard will be proposed at this time (no proposed % blend of hydrogen)
- The IOUs will continue research
- SoCalGas/SDG&E is proposing a Hydrogen Blending Demonstration Program

SoCalGas and SDG&E Hydrogen Blending Demonstration Program

- Led by SoCalGas/SDG&E
- Ground truth research results on plastic distribution systems and residential end user equipment
- Test new hydrogen injection equipment and hydrogen leak detection equipment
- Done in parallel with continued research on steel pipeline, compressors, underground storage, etc.

Research Related Questions

- Would we have to replace the gas piping we currently have (due to potential embrittlement and potential for additional leakage)? Will gas meters have to be replaced?
- Will the mixture work with current technology?
- Any research on end use equipment, including end use burners, combustion engines?
- Any Hydrogen Embrittlement research?

Research Action Plan Matrix

- Developed by the IOUs to help identify, prioritize, and track knowledge gaps for hydrogen blending

- Plan is built upon four categories:
  - Long Term System Integrity Impacts
  - System and Industrial Equipment
  - End Use Appliances (Residential and Commercial)
  - General

Select SoCalGas Projects

In-Service Welding onto Methane-Hydrogen Mixture Pipelines (2021)

Hydrogen Blending Impacts on Residential & Commercial Combustion Equipment (2020)

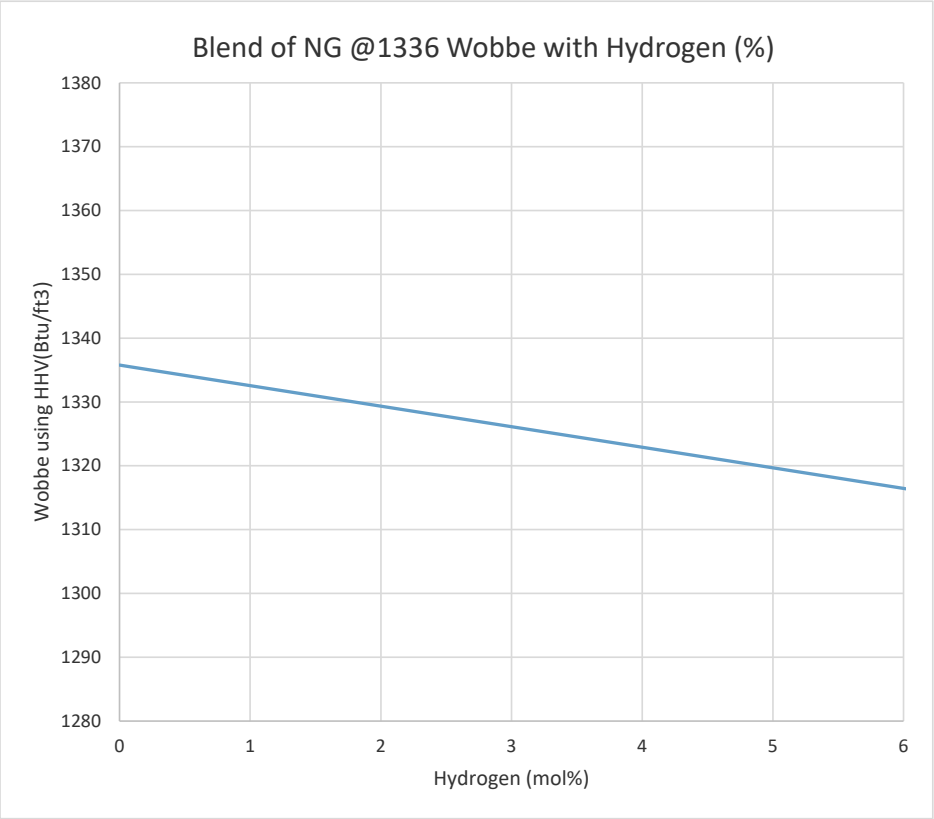
Evaluation of Methane Detection Technologies with Hydrogen-Methane Blends (2020), Evaluation of Gas Chromatographs Capable of Detecting Hydrogen (2021)

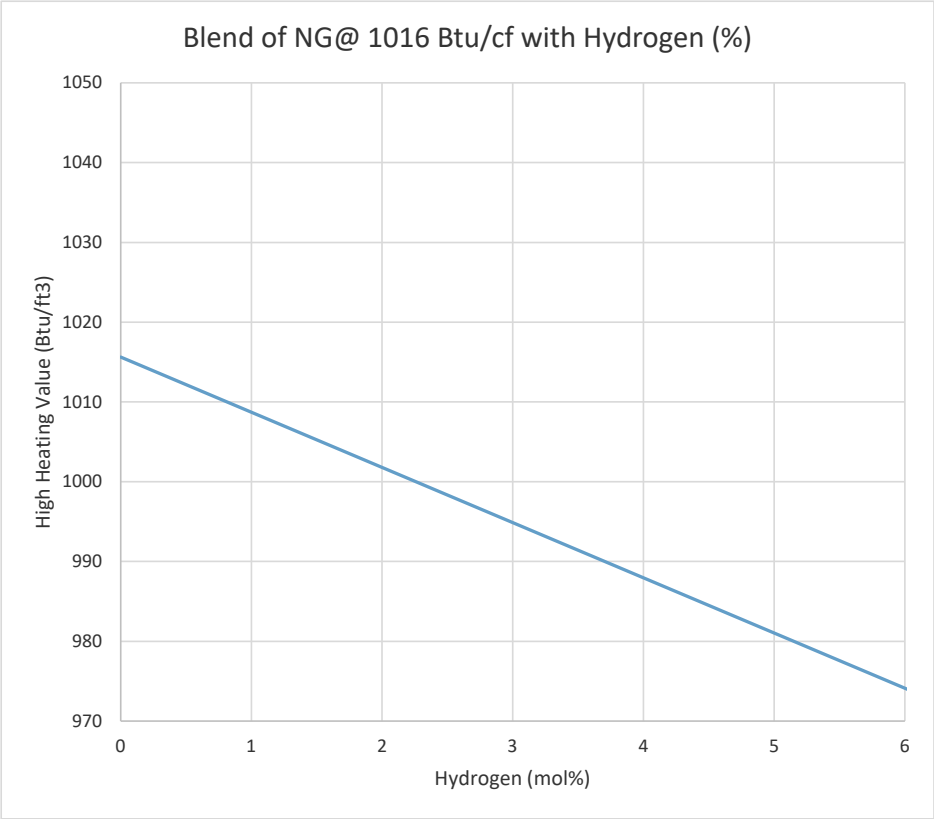
Operational Questions

- How does hydrogen affect the BTU/Wobbe/heating value?
- Would the mixture change the gas pressure?
- How would the new mixture affect criteria air pollutants?
- Have the local air districts discussed whether permitting would change?

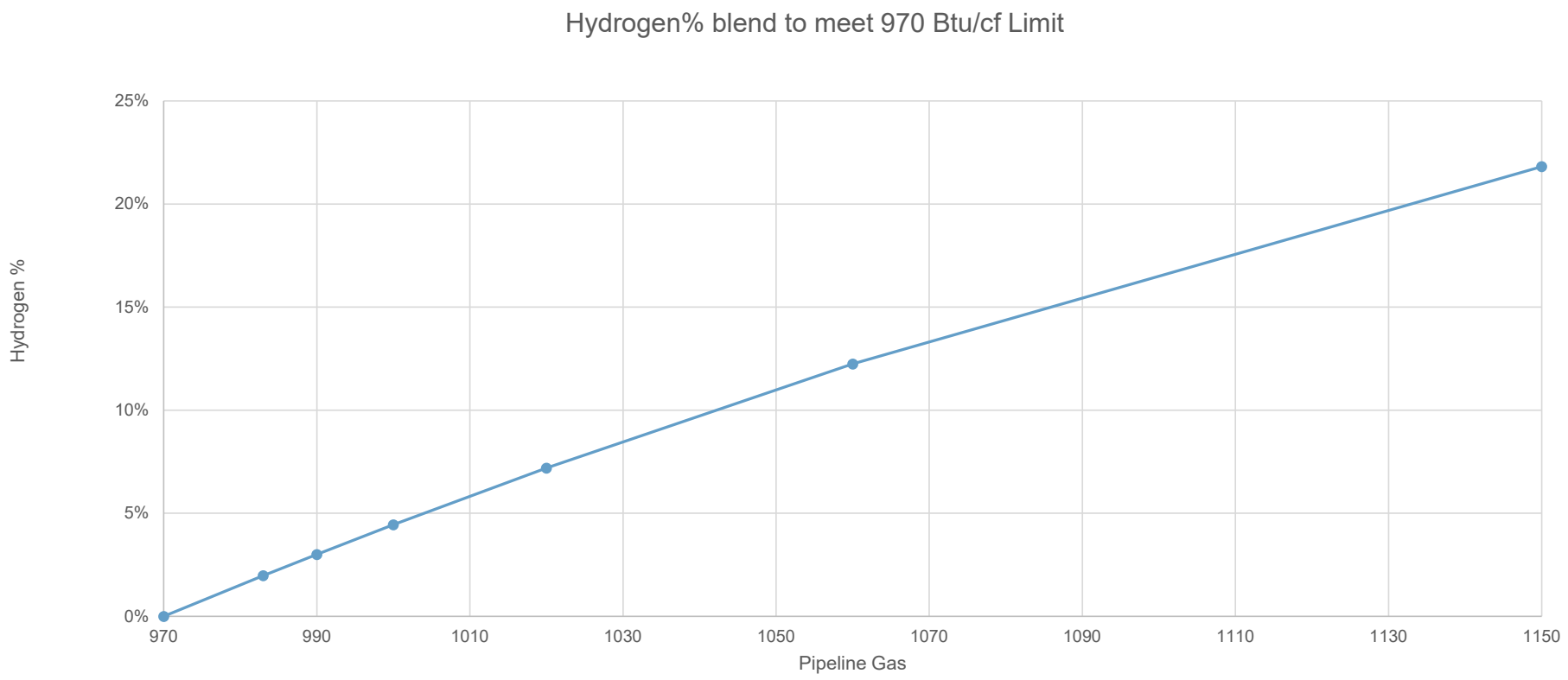
Q&A

Effect of Hydrogen on BTU/Wobbe/Heating Value





BTU Chart


Hydrogen% blend to meet 970 Btu/cf Limit
Hydrogen %
25%
20%
15%
10%
5%
0%
970
990
1010
1030
1050
1070
1090
1110
1130
1150
Pipeline Gas

Thank You For Your Time!

» Please contact your Account Executive if you have additional questions or comments