

Frequently Asked Questions: CCST Report on Biomethane in California Common Carrier Pipelines

This FAQ refers to the CCST Commissioned Report and CCST Expert Briefing: “Biomethane in California Common Carrier Pipelines: Assessing Heating Value and Maximum Siloxane Specifications”

1) Why didn't the California Council on Science and Technology (CCST) provide a definitive number for the heating value or the siloxane concentration?

As an independent, non-governmental entity, CCST does not write regulations. CCST provides relevant and credible science-based information to help inform decisions by California policymakers — in this case the California Public Utilities Commission (CPUC).

2) What is a Higher Heating Value (HV)?

Referred to in this CCST report as simply “heating value” or HV, this technical term refers to the amount of heat that can be generated from combusting a gas, written in terms of energy-per-unit volume (British Thermal Units/standard cubic foot; BTU/scf). The HV of a gas depends on its chemical composition. Injecting a low-HV gas into a pipeline with high-HV gas will result in a lowered HV for the blended gas. Maintaining the HV in a gas supply is important, both for product quality and consumer expectation (e.g. time it takes to cook food on a gas stove), and for safe transport and combustion. Currently, biomethane must have a HV of 990 BTU/scf prior to pipeline injection.

3) What does the report recommend for the minimum heating value?

The report recommends initiating a regulatory proceeding via the California Public Utilities Commission (CPUC) to examine the option of allowing biomethane that satisfies the current Wobbe Number limits and all other requirements to be injected into the common carrier pipeline, but with a heating value as low as 970 BTU/scf, compared to the current requirement of 990 BTU/scf.

4) What is the Wobbe Number?

Also referred to as the Wobbe Index, this number serves as one indicator of whether two types of gaseous fuels can be interchangeable when combusted for use. The number represents the energy-to-density characteristic of a gaseous fuel. If two fuels — natural gas versus biomethane, for example — are determined to have similar Wobbe Numbers, then one can substitute for the other without loss in combustion performance.

5) What are siloxanes?

Unlike biogas processed from agricultural and forestry sources, biogas processed from landfill or wastewater/sewage sources is likely to harbor volatile organic silicon compounds (“siloxanes”), due to residues from human products such as cosmetics. The combustion of biomethane containing siloxanes generates “amorphous silica nanoparticulates” — smaller than the size of a flu virus — which can form deposits on and may cause damage to combustion surfaces such as gas burners or engines. The human health impact of silica inhalation is unclear, and international standards are currently being developed for measuring these compounds. However, the California Public Utilities Commission has set maximum siloxane levels in biomethane since 2014 of no more than 0.1 mg Si/m³.



6) What does the report recommend for the maximum siloxane concentration?

There are several recommendations in the report concerning siloxanes.

- Support a comprehensive research program to understand the operational, health, and safety consequences of various concentrations of siloxane in biomethane supplies.
- There is not enough evidence to recommend any changes to the maximum allowable siloxane concentration at this time.
- Consider the development of a reduced and simplified verification regime for biomethane sources that are very unlikely to have siloxanes, such as dairy waste or agricultural waste.
- Monitor the ASTM International process to adopt and test a standard test method for siloxanes.
- Use the learnings from the siloxane research and ASTM International's process to revisit the siloxane maximum standards once more complete information becomes available.

7) Does the CPUC have to write new regulations in response to the CCST biomethane report recommendations?

No, the CPUC does not have to write new regulations. The legislation that requested the CCST study does require that within six months of the report's release, the CPUC reevaluate its requirements and standards for biomethane to be injected into common carrier pipelines and, *if appropriate*, change those requirements and standards, giving due deference to the recommendations made in the study by CCST.

8) What is Rule 30?

Regulations regarding the transportation of customer-owned gas by Southern California Gas Company (SoCalGas).

9) What is Rule 21?

Regulations regarding the transportation of gas by Pacific Gas and Electric Company (PG&E).

10) Who commissioned CCST to complete this report?

This report was requested by the California State Legislature via the Budget Act of 2016 (SB 840), partially in response to HV and siloxane concentration regulations written pursuant to AB 1900 (2012, Gatto). AB 1900 requires the CPUC to adopt (1) standards for biomethane that specify the concentrations of constituents of concern that are reasonably necessary to protect public health and ensure pipeline integrity and safety, as specified, and (2) requirements for monitoring, testing, reporting, and recordkeeping, as specified. The bill would require a gas corporation, as defined, to comply with those standards and requirements.

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