

DOCKETED

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Renewable Natural Gas: Biomethane & Hydrogen



CEC IEPR Workshop
April 22, 2019

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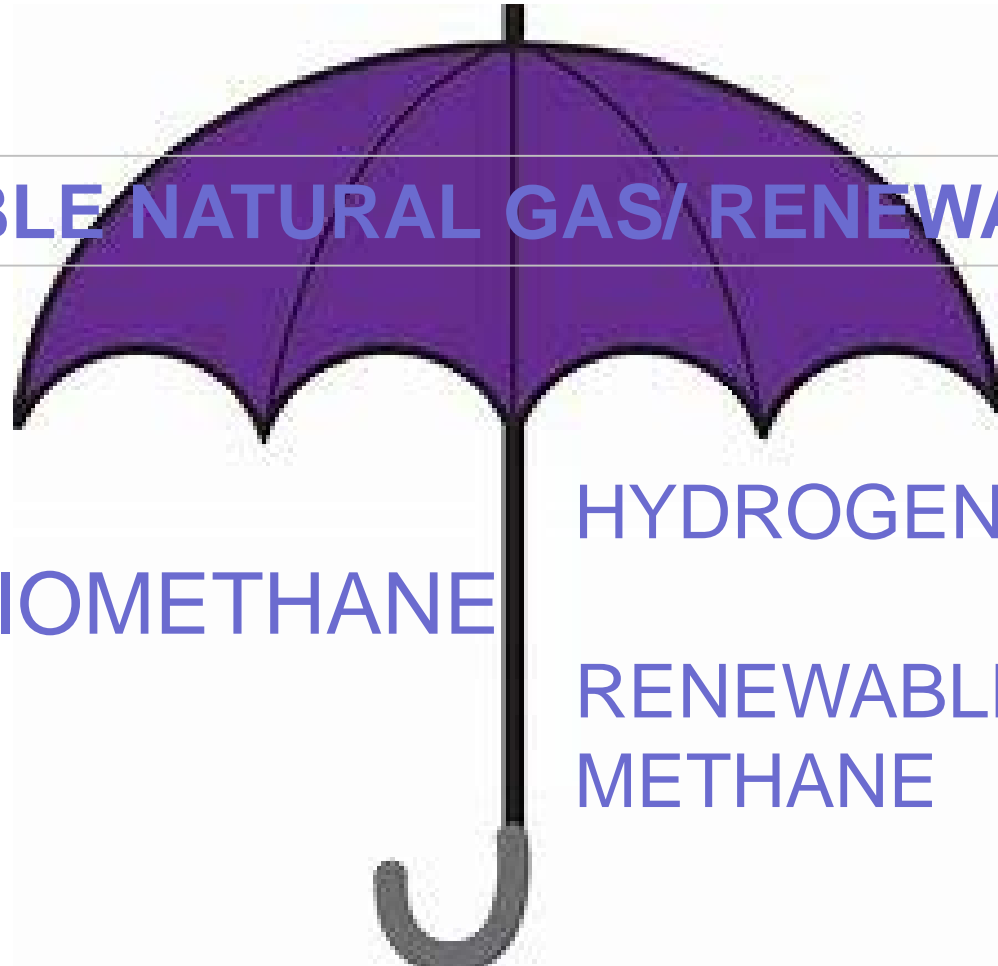
Terms

RENEWABLE NATURAL GAS/RENEWABLE GAS

BIOMETHANE

HYDROGEN

RENEWABLE
METHANE





Legislation

- AB 1900 (Gatto 2012) – develop biomethane pipeline injection standards
- SB 1383 (Lara 2016)– develop at least 5 dairy biomethane pipeline interconnection projects; significantly increase the production and use of in-state biomethane in electric and transportation industries
- SB 840 (Budget 2016)– CCST deep dive into heating value & siloxane
- SB 2313 (Williams 2016)– extend the end-date for the interconnection incentive program
- SB 1440 (Hueso 2018) – determine cost effective renewable natural gas procurement
- AB 3187 (Grayson 2018)– work on renewable natural gas interconnection process
- SB 1369 (Skinner 2018) – consider hydrogen as energy storage



Goals / Expected Outcomes

- California imports about 95% of the fossil natural gas we use every day
 - Current California gas market impacted by infrastructure failures
- Any regulatory actions taken should help meet state emissions reduction goals. Moving towards a system that flows a decarbonized/zero-carbon gas product could:
 - Reduce system and end-use carbon emissions and reduced negative health impacts
 - Increase jobs
 - Enhance in-state system reliability
- Too early to tell how much RNG will be introduced into California supply
- Reducing waste gas from flaring directly into the atmosphere and instead putting it to beneficial use via pipeline injection for use in electric and transportation sectors moves state towards short-lived climate pollutant reduction goals. *See ARB SLCP Reduction Strategy 2017*



Dairy Pilots Update

- http://www.cpuc.ca.gov/renewable_natural_gas/
- R. 17-06-015, 2018 Solicitation, Application evaluation process, Selection
- 6 pilot projects selected:
 - [http://www.cpuc.ca.gov/uploadedFiles/CPUC_Website/Content/Utilities_and_Industries/Energy/Energy_Programs/Gas/Natural Gas Market/FinalSelectionComScoreCardSum.pdf](http://www.cpuc.ca.gov/uploadedFiles/CPUC_Website/Content/Utilities_and_Industries/Energy/Energy_Programs/Gas/Natural_Gas_Market/FinalSelectionComScoreCardSum.pdf)
- Reviewing contracts for dairy biomethane pilot projects
- The 6 selected pilot projects comprise a little less than 6300 MMBtu/day of supply (about 2.36 Mcf/year), at a total installation cost of about \$132 million and annual O&M costs of \$1.4 million. Negligible impact on supply of natural gas currently, but a start.



Barriers / Issues

NOT under CPUC jurisdiction

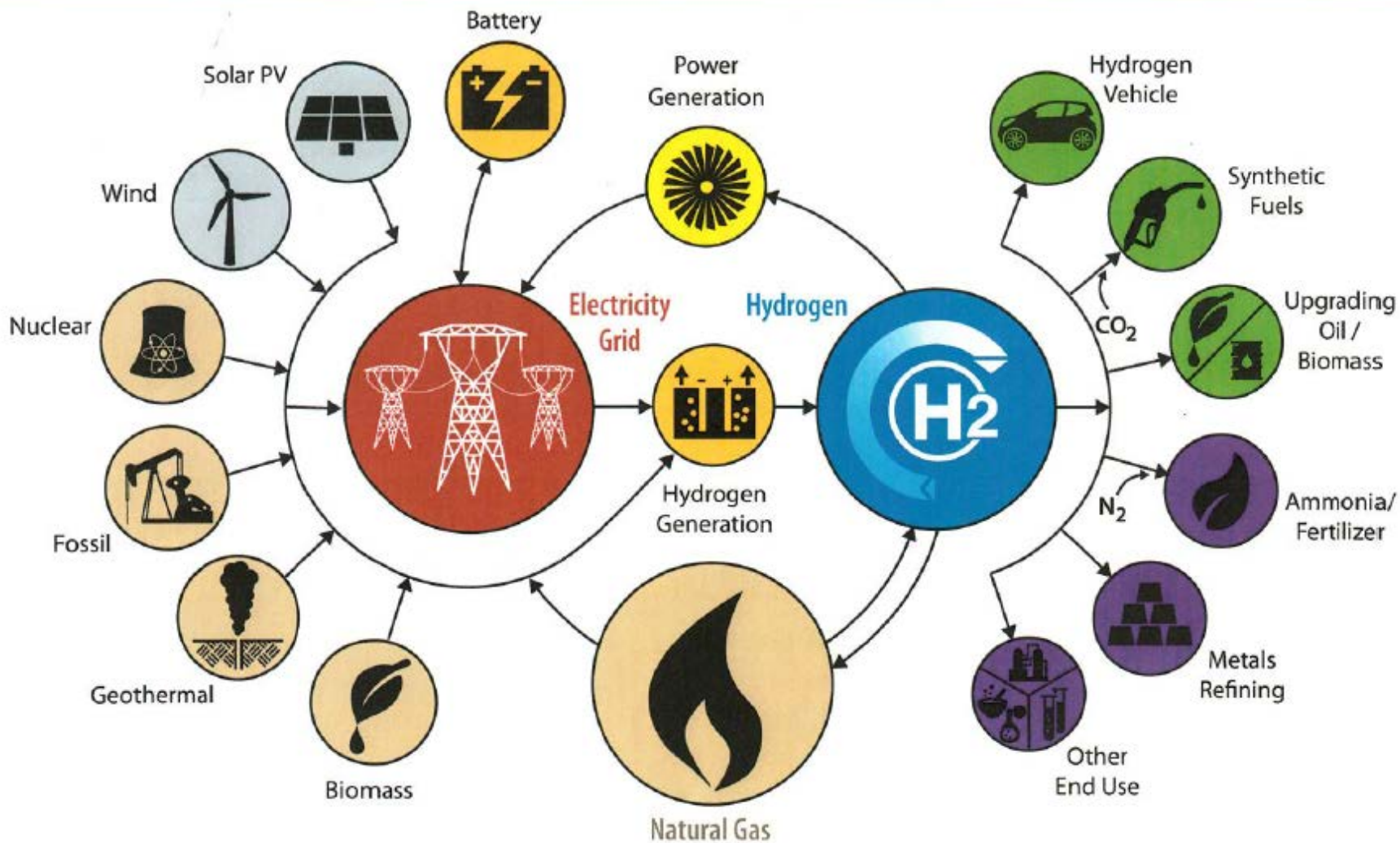
- Market issues
 - CARB Low Carbon Fuel Standard (LCFS) credits
 - FedEPA Renewable Identification Numbers (RINs)
 - Pushing RNG towards transportation
 - What does the future hold?



Current CPUC Efforts – Ongoing Barriers / Issues under CPUC jurisdiction

- Utility procurement pilots for use in CNG pumps
 - With LCFS and RIN credits, “in the money”
- Renewable natural gas pipeline interconnection tariff standardization
- SoCalGas voluntary opt-in RNG tariff, A.19-02-015
 - Core residential customers choose how much maximum \$ per month amount for RNG purchase
 - Commercial / industrial customers chose \$ amount or % of gas use
- Biomethane constituents of concern: update due July 2019
- Hydrogen injection standards and renewable gas procurement standards→

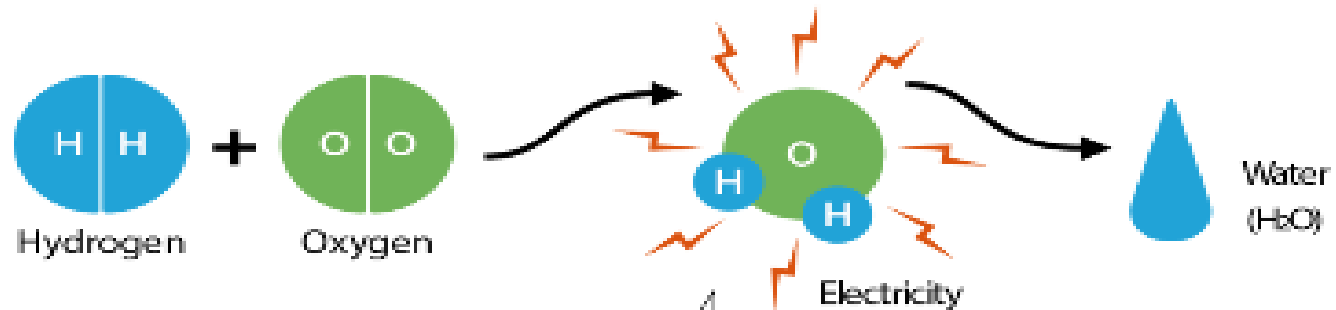
H₂@Scale: Linking Natural Gas, Electric and H₂ Grids





Hydrogen: Problem We're Trying to Solve

When hydrogen is used as a power source, the only byproduct is water; no carbon dioxide is emitted.



Water is the only byproduct of power generation with hydrogen.



- We use a lot of natural gas! (high energy density, easy to store, cheap, dispatchable) But, it's destroying the planet. What if it weren't?
- Let's decarbonize the natural gas system, use a decarbonized gas form of fuel. (Retain advantages in a non-polluting, renewable form of gas.)
- Mobile & Stationary Sources



Hydrogen issues under CPUC jurisdiction

- Production: via Electricity Rates
- Transportation: in pipeline system?
- Storage: in pipelines? in salt mines attached to pipelines? In blended gases?
 - Theory: seasonal time shifting of renewable electricity via **storage** in the pipeline system*



Barriers to US Hydrogen Proliferation

- Technology doubts/ lack of awareness & funding/
False assumptions
 - IHS Study -- EU and California – Leeds!
- Standard safety questions about hydrogen*
- Questions about cost → Electricity rates for hydrogen production
- Need to determine pipeline injection/safety/
blending standards (European studies are a start.)
 - Both topics fall within open proceedings



Hydrogen – CPUC Policy

- **R. 13-02-008:** 18 parties have requested a phase or OIR on hydrogen transportation
- **R. 18-12-006:** investigate electric rates to produce hydrogen (...transportation fuel...)
- **SB 1369** (Skinner 2018) hydrogen to be considered “storage.”



California Hydrogen Update

- AB 8, Perea 2013: \$20 million annually for H2 refueling stations to support early FCEV market – AB 8 program is necessary until there are at least 100 publicly available hydrogen-fueling stations in operation in CA
- Governor Jerry Brown's Exec Order B-48-18: 5 million ZEVs by 2030 ** FCEV + battery EV
 - Goal 200 hydrogen fueling stations by 2024
 - LCFS update to add Hydrogen Refueling Infrastructure credits for unused capacity for 15 years on top of LCFS credits for dispensing fuel
- By end of 2018, **39 hydrogen refueling stations** (including 1 privately funded) are open to the public.*
- **Another 26 stations** are funded and in various stages of development