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<th><strong>DOCKETED</strong></th>
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<td><strong>Docket Number:</strong> 21-IEPR-05</td>
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<td><strong>Document Title:</strong> Presentation - Renewable Natural Gas Building on Lessons from Low Carbon Fuel Standard Success to Drive RNG Use Across All Sect</td>
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<td><strong>Description:</strong> S25D Sam Wade, Coalition for Renewable Gas</td>
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<td><strong>Filer:</strong> Raquel Kravitz</td>
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Renewable Natural Gas:
Building on Lessons from Low Carbon Fuel Standard
Success to Drive RNG Use Across All Sectors

Sam Wade
Coalition for Renewable Natural Gas
Director of Public Policy
Presented to the California Energy Commission
August 31, 2021
About the RNG Coalition

• The leading advocacy and education voice for RNG in North America
• We advocate for the sustainable development, deployment and utilization of renewable natural gas so that present and future generations will have access to domestic, renewable, clean fuel and energy
• RNG developers, marketers, financiers, technology providers, consultants, utilities and labor coming together
• 98%+ of the RNG supply in North America
RNG Coalition LEADERSHIP Members

Not all pictured, for a full list see: https://www.rngcoalition.com/coalitionmembers
RNG Coalition GENERAL Members

Not all pictured, for a full list see: [https://www.rngcoalition.com/coalitionmembers](https://www.rngcoalition.com/coalitionmembers)
RNG Coalition ACADEMIC Members

Not all pictured, for a full list see: https://www.rngcoalition.com/coalitionmembers
Abating Methane from Organic Wastes Remains a Critical Climate Strategy, both in Globally and in California

“Sustained methane mitigation, wherever it occurs, stands out as an option that combines near- and long-term gains on surface temperature and leads to air quality benefits by reducing surface ozone levels globally.”

“Over time scales of 10 to 20 years, the global temperature response to a year’s worth of current emissions of SLCFs is at least as large as that due to a year’s worth of CO₂ emissions (high confidence). Sectors producing the largest SLCF-induced warming are those dominated by CH₄ emissions: fossil fuel production and distribution, agriculture and waste management.”

“For example, some short-term ‘win-win’ policies that simultaneously improve air quality and limit climate change include the implementation of energy efficiency measures, methane capture and recovery from solid waste management and oil and gas industry...”

“California’s organic waste streams are responsible for half of the State’s methane emissions and represent a valuable energy and soil-enhancing resource. Effectively implementing the measures described in this SLCP Strategy will not only reduce methane emissions but provide many other benefits as well, including cutting emissions of CO₂ and boosting economic growth in agricultural and rural communities.”

SB 1383 (Lara, 2016) Goals and Progress

• **CalRecycle:**
  “Organics recycling and recovery infrastructure is growing, but still needs significant expansion to provide the recycling capacity necessary to meet the SB1383 disposal and methane reduction goals.”
  “Due to high capital expenses, AD facilities often rely on revenue from renewable energy incentives to make projects economically feasible.”

• **CARB:**
  “This Analysis shows that the dairy and livestock sector is projected to achieve just over half of the annual methane emissions reductions necessary to achieve the target by 2030 through modifications to manure management systems—primarily using anaerobic digesters—and additional reductions through decreases in animal populations.”
  “New or expanded local, State, or federal incentives or funding mechanisms could potentially accelerate the capture and beneficial use of California biomethane, provide additional revenue necessary to ensure that California’s dairy manure methane emissions are captured, and direct the biogas to difficult-to-decarbonize sectors”

• **RNG industry stands ready to help achieve the goals, agrees that economics of RNG production will be a key driver**

[https://www2.calrecycle.ca.gov/Publications/Details/1693](https://www2.calrecycle.ca.gov/Publications/Details/1693)
[https://ww2.arb.ca.gov/sites/default/files/2021-06/draft-2030-dairy-livestock-ch4-analysis.pdf](https://ww2.arb.ca.gov/sites/default/files/2021-06/draft-2030-dairy-livestock-ch4-analysis.pdf)
RNG Production Facilities In North America

RNG Projects
Operational: 188
Under Construction: 137
Planned: 95
Total: 420
California’s Low Carbon Fuel Standard (LCFS)

- California’s primary program to promote alternative fuel use in the transportation sector

Goals:
- Reduce carbon intensity (CI) of transportation fuels
- Transform and diversify fuel pool
- Reduce petroleum dependency

Benefits:
- Reduce emissions of criteria pollutants and toxics
- Support other state environmental goals:
  - SB 1383 (methane and organic waste reduction)
  - SB 1505 (renewable hydrogen)
  - Sustainable changes in the Natural and Working Lands Sector
How Does CA LCFS Work?

High carbon fuels generate deficits

Low carbon fuels generate credits

-6.25 - 10 - 12.5 - 15 - 16.25 - 17.5 - 18.75 - 20

2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030
Each RNG Pathway Has a Unique Lifecycle Carbon Intensity Score

**Ag Manure Projects**
- Can achieve GHG reductions of over 500% relative to fossil gas, due to large amounts of methane destruction
- Active area of RNG project development in response to state-level programs

**Dedicated Anaerobic Digestion of Organic Wastes**
- Score better than landfill projects due to avoiding remaining methane emissions from landfills (aligns with many states’ organics diversion goals)
- Expected to be a large long-term source of RNG as feedstocks transition out of landfills

**Landfill and Wastewater Projects**
- Organic wastes into landfills provide the greatest supply of RNG currently
- Have higher CI scores, due to mandatory requirements to flare methane in the baseline case, but most are still significantly better than fossil gas or diesel.
- Can still compete against each other to be the lowest CI supplier by reducing emissions associated with energy use/methane leakage during capture, upgrading and gas transport
- Wastewater projects have similar CI drivers but provide less RNG volume than landfills
CA LCFS is Working, Achieved 98% RNG Blend Rate in Transportation NGVs in Q1 2021
California Leadership is Leading to Expansion of Clean Fuel Standards Across North America
Current CA Policy Promotes RNG Creation, Use in Transportation and Power. But not Use in the Largest Gas Demand Sectors (Residential, Commercial, Industrial).

- **Cap-and-Trade Funding:**
  - Grants (CDFA, CalRecycle, CEC)
  - Offset Credits (for ag projects)

- **Utility RNG Procurement Policy (SB 1440)?**

- **BioMAT or Renewable Portfolio Standard**

- **Low Carbon Fuel Standard (LCFS) and Renewable Fuels Standard (RFS)**

- **Residential and Commercial Applications (34%*)**
  - LCFS (for fuel-related industry only)
  - Utility RNG Procurement Policy (SB 1440)?

- **Industrial Applications (37%):**
  - CARB Policy for Non-Core?
  - LCFS and RFS

- **Vehicle Filling Station (1%):**
  - Renewable Portfolio Standard

- **External Gas Power Plants (28%):**

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*Percentages of 2019 total natural gas volume delivered to customers in California, US EIA

Graphic Source: Modified from Biowaste to Bioenergy, FvB, 2016
Many Concepts from LCFS can be Imported into Other Policies to Promote RNG (e.g., Utility Procurement Programs)

- Key metric should always be “mass of CO$_2$e/MJ of gas delivered,” matching the LCFS.
- Lifecycle analysis using this metric can addresses common critiques/concerns about RNG:
  - High carbon/energy intensive methods won’t be used to make RNG (would have poor scores)
  - Methane leakage rates are captured in the scoring (less leaks $\rightarrow$ better score)
  - Minimize transportation distances/new gas infrastructure (minimize transport distance/lower embedded emissions $\rightarrow$ better score)
- Thoughts on CPUC Proposal for SB 1440 Framework:
  - Emphasize primary procurement method should be lifecycle $$/\text{ton performance}$.
  - Each year each gas suppliers can then show how many GHG reductions they’ve achieved through RNG procurement (volume-weighted portfolio CI multiplied by RNG blend rate)
  - Same framework could incent biomethane in the near-term and renewable H$_2$ or synthetic gas (SNG) in the longer term, in-line with studies about how to meet our long-run decarbonization goals
RNG Procurement by Gas Utilities is a Growing Trend Across North America

**BC GHG Reduction Regulation**
- Allows utilities to procure RNG for up to 15% of 2015 demand for all customers
- Fortis BC offers an opt-in product for customers that want more RNG

**OR SB 98 (2019)**
- Implemented by OR PUC in 2020
- Northwest Natural procuring RNG today
- Soft target of 15% by 2030 and 30% by 2045

**Quebec Regulation Respecting the Quantity of RNG to be Delivered by a Distributor**
- Requires utilities to procure RNG for at least 10% of 2030 demand for all customers
- Gazifere offers an opt-in product for customers that want more RNG

Studies on Deep Decarbonization See a Role for RNG, Disagree About What Sector Should Use It

### Table 2-1 | The Role of RNG in Deep Decarbonization Studies

<table>
<thead>
<tr>
<th>REGION</th>
<th>STUDY</th>
<th>FINDINGS AND ASSUMPTIONS RELATED TO ROLE OF RNG IN DEEP DECARBONIZATION BY MIDCENTURY OR EARLIER</th>
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<tbody>
<tr>
<td>California</td>
<td>Getting to Neutral Options for Negative Emissions in California (Staker et al. 2010)</td>
<td>Cross-cutting: Reaching net-zero emissions will require scaling of net-negative decarbonization strategies. RNG and hydrogen from organic wastes can play a role if coupled with emerging CCS technologies to achieve added carbon removal. Stationary end uses: Alongside electrification efforts, RNG and hydrogen may be used in existing gas distribution networks to help decarbonize hard-to-abate end uses and meet peak heating demand.</td>
</tr>
<tr>
<td>Northeast</td>
<td>Northeastern Regional Assessment of Strategic Electrification (Hopkins et al. 2017)</td>
<td>Cross-cutting: Alongside rapid electrification, RNG and other low-carbon fuel supply can be deployed to further lower emissions.</td>
</tr>
<tr>
<td>Northeast</td>
<td>Northeast 50x50 Pathway (National Grid 2016)</td>
<td>Stationary end uses: Region can reduce emissions through rapid transition away from liquid fuels in building heating and conversion to electric heat pumps, natural gas, and renewable natural gas from local feedstocks.</td>
</tr>
<tr>
<td>Northeast</td>
<td>The Role of Renewable Biofuels in a Low Carbon Economy (Lowell and Saha 2020)</td>
<td>Cross-cutting: Complementary deployment of biofuels may be viable for decarbonization. Transport: Alongside significant electrification of heavy-duty vehicles (with the exception of combination trucks), RNG fuels 80-100% of NG vehicles in 2050. Stationary end uses: Alongside electrification, RNG may be used to meet 5-10% of residential and commercial heating demand in 2050.</td>
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Notes: RNG = Compressed natural gas; CCS = Carbon capture and storage; NG = Natural gas.
Source: WRI authors, based on studies cited above.
CEC Should Articulate a Multi-Phase Strategy for Use of RNG Resource in this IEPR Cycle

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<tr>
<th>Near-Term: Reduce Methane Emissions</th>
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<tbody>
<tr>
<td>• Build the RNG projects immediately to reduce methane from organic waste streams as fast as possible</td>
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<tr>
<td>• Reach 2030 SCLP reduction goals</td>
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<tr>
<td>• Begin to decarbonize the gas system</td>
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<th>Mid-Term: Begin to Prioritize RNG Use in Hard to Decarbonize Sectors</th>
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<tr>
<td>• RNG projects that are pipeline injected offer a flexible resource that can be sent to the sectors that most need it over time (i.e., those that prove to be hard to decarbonize in other ways)</td>
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<tr>
<td>• This choice becomes more important when remaining gas demand is closer to RNG supply</td>
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<th>Long-Term: Manage Transition to H₂ with CCS</th>
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<td>• When hydrogen transport infrastructure develops, consider transitioning bio feedstocks to H₂ molecule as the energy carrier (especially for non-AD feedstocks)</td>
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<tr>
<td>• Couple H₂ production with Carbon Capture and Sequestration to get carbon negative outcomes</td>
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Conclusions

• Many additional opportunities exist to deploy RNG across all California sectors that currently use conventional gas
  • Critical to build out RNG to reach methane reduction goals and to begin the decarbonization of the gas sector

• California’s LCFS is a proven model to support RNG project development
  • RNG is delivering the promised GHG benefits and remains the lowest carbon fuel in the LCFS program
  • Similar support needed to promote RNG across additional end uses

• RNG production capacity expansion will allow cities, counties, and California’s waste and agricultural sector to comply with SB 1383 requirements

• Timely California leadership will be highly valuable in providing a consistent vision for how the RNG resource is developed and utilized across North America
Speaker Info

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