Update on Markets and Incentives for Manure-Derived Renewable Gas: West Coast Focus

2024 High Plains Dairy Conference

Presented by Sam Wade

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About RNG Coalition

- Provide education and policy advocacy on behalf of renewable gas and and adjacent industries in North America
- We advocate for the sustainable development, deployment and utilization of renewable gas so that present and future generations will have access to domestic, renewable, clean fuel and energy
- 400+ members including: RNG developers, marketers, financiers, technology providers, consultants, utilities and labor coming together
- 98%+ of the RNG supply in North America

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RNG Captures Methane from Organic Waste and Puts it to Productive Use

- RNG projects capture methane from existing organic waste sources (food waste, animal manure, wastewater sludge and garbage) and redirect it away from the environment, repurposing it as a clean, green energy source.
- 25+ years of research and support from US EPA (AgStar,[1] LMOP[2])
- 20+ years of support from California
  - 2002 Dairy Power Production Program
  - 2013 First LCFS RNG Credits
  - 2016 SB 1383 (Laura)
  - 2017 CA Short Lived Climate Pollutant Reduction Strategy
- Proven clean energy technology that also addresses many waste and agriculture emission issues as part of a circular economy.

1 US EPA AgStar Program, https://www.epa.gov/agstar/benefits-anaerobic-digestion#:~:text=Anaerobic%20digesters%20can%20destroy%20more,to%20human%20and%20animal%20health.
2 US EPA Landfill Methane Outreach Program, https://www.epa.gov/lmop/benefits-landfill-gas-energy-projects.

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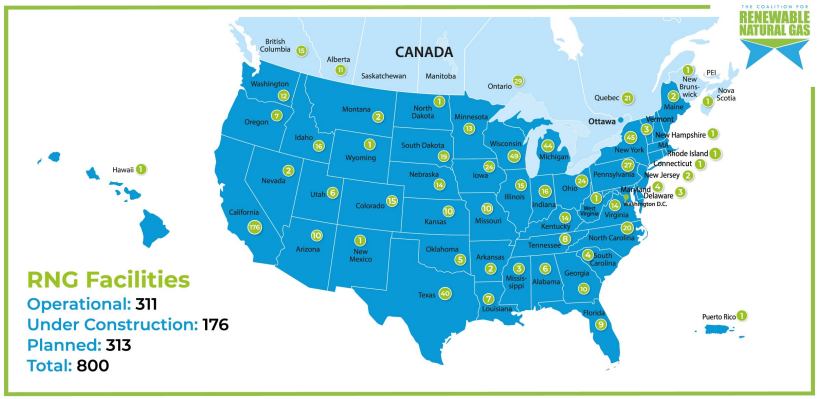

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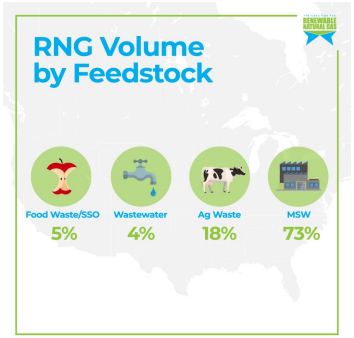
Where Does RNG Come From Today?



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Inflation Reduction Act Created New RNG Incentives

Contains beneficial tax policies advocated for by RNG Coalition:

- Section 48 ITC needs to properly include all biogas property, cleaning and conditioning equipment
- 45V hydrogen tax credit to allow for the use of RNG and other biologically-derived feedstocks
- Extension of alternative fuel tax credit
  - Applicable to all transportation-quality fuels
- 45Z Clean Fuel Production Credit (CFPC), provides a tax credit for fuels relative to how low their carbon intensity (CI) score is against a baseline level
- 45Q carbon oxide sequestration credit
  - Important for carbon negative RNG and hydrogen pathways

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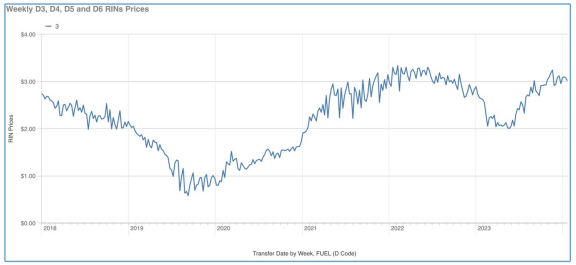
Renewable Fuel Standard

- Supports development and commercial-scale deployment of biofuels
- Dairy RNG qualifies as a cellulosic biofuels (D3)
- RNG transportation grew from 142M ethanol gallons (2015) to 665M gal (2022).
- Targeting 1,380M EGE by 2025.



7 https://www.epa.gov/fuels-registration-reporting-and-compliance-help/rin-trades-and-price-information

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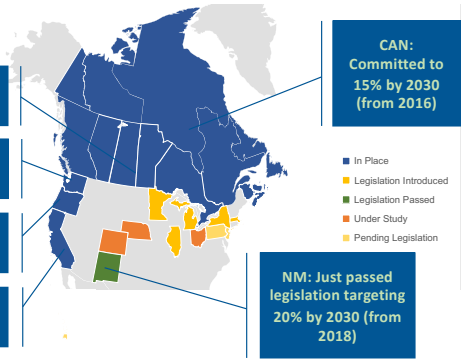
Low Carbon/Clean Fuel Standards Continue to Expand, Existing Programs Focusing on Increases in Ambition

BC: Committed 30% Carbon Intensity Reduction by 2030 (from 2010)

WA: Committed to 20% by 2034 (from 2017)

OR: Committed to 37% by 2035 (from 2015)

CA: Examining at least 30% by 2030 (from 2010)



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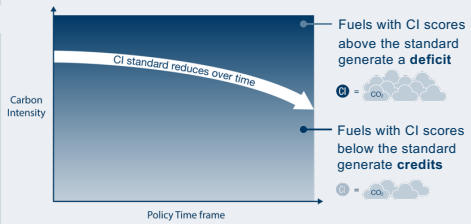
Using CI Scores to Set a Clean Fuel Standard

A **clean fuels policy** is a market-based policy that sets a requirement to reduce the average carbon intensity (CI) of transportation fuels over time.

How it works:

- Transportation fuels are assigned CI scores based on their GHG Life Cycle Analysis (LCA).
- The policy establishes a CI standard based on the average CIs of the fuels.
- The CI standard is reduced over time relative to the baseline CI of fuels in a reference year.



9 Figure Source: Great Plains Institute

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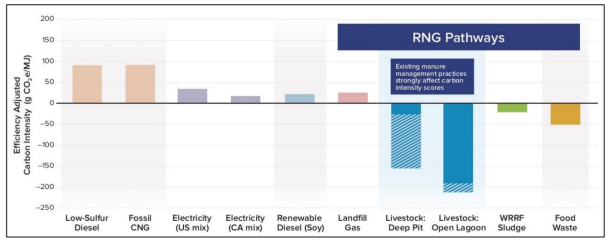
Dairy RNG Pathways Often Have the Best CI Scores



Some RNG pathways have very low carbon intensity (CI) scores because they capture emissions that would otherwise be released to the atmosphere. For farms with manure lagoons that currently emit high levels of methane, RNG production can yield negative CI scores. The diagonal-line overlays on bars represent the *range* of carbon intensity scores that can be achieved with corresponding RNG projects. (CA = California; CNG = compressed natural gas; CO_2e = carbon dioxide equivalent; g = gram; MJ = megajoule; RD = renewable diesel; WRRF = water resource recovery facility.) (ANL GREET)

10 Figure Source: Argonne National Labs

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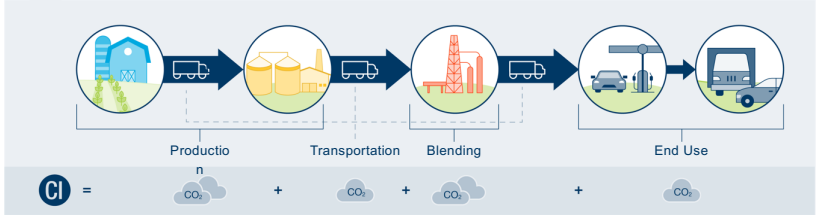
Calculating the Carbon Intensity of Fuel

A **carbon intensity (CI) score** is a measure of all emissions in a fuel's "well-to-wheels lifecycle, including production, blending, distribution and use.



11 Figure Source: Great Plains Institute

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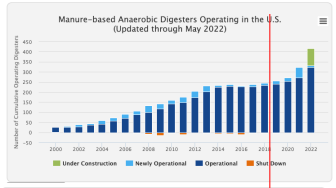
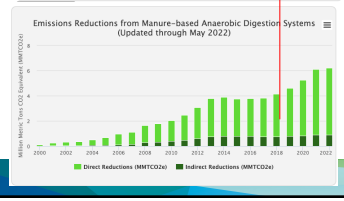
Growth in Ag Digesters due to California LCFS is Clear from US EPA AgStar Data





- AgSTAR estimates that biogas recovery systems are technically feasible for over 8,000 large US dairy and hog operations
- Adding avoided methane crediting to dairy RNG pathways in the CA LCFS helped drive growth from 244 operational projects in 2018 to 343 operational projects in the United States as of January 2023
- Post-2018 projects account for ~2 million metric tons CO_2e per year

12 https://www.epa.gov/agstar/agstar-data-and-trends

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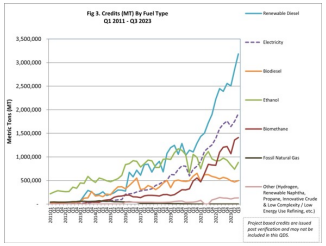
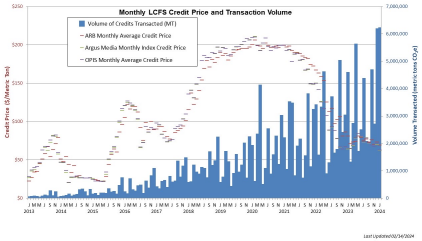
California LCFS Has Become Oversupplied





https://ww2.arb.ca.gov/resources/documents/lcfs-data-dashboard

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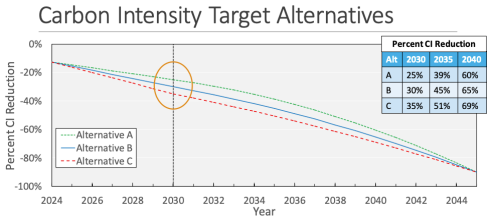
California Air Resources Board Plans to Increase Program Stringency



Percent CI Reduction			
Alt	2030	2035	2040
A	25%	39%	60%
B	30%	45%	65%
C	35%	51%	69%

- CARB has workshopped 25%, 30%, and 35% 2030 LCFS program targets
- Clean fuel voices helped fund work by the consulting firm ICF demonstrating that higher ambition (41-44% for 2030) is possible
- If incentives for RNG (and other low carbon fuels) are properly optimized, we recommend:
  - >25% target in 2025
  - 30-44% target in 2030

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Other RNG Topics Under Debate in California - Avoided Methane Crediting

- Avoided methane crediting makes agricultural RNG projects possible, incentivizes maximum greenhouse gas capture during RNG production
- Critical to continue to cover operating costs of RNG facilities:
  - In early 2000s, California built digesters funded by California Energy Commission Dairy Power Production Program
  - Many shut down within 5 years due to insufficient revenue to cover operating costs. Total install base was flat for a decade.
  - Some farms returned to venting methane.
  - Since the year CARB published the first LCFS avoided methane dairy digester pathway, no California dairy digesters have shut down

RNG Coalition Position: A fixed-year phase-out of avoided methane crediting—as included in the Proposed CARB LCFS Rule—is simply not smart policy

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Other RNG Topics Under Debate in California – Deliverability of RNG

- CARB considering limits on where RNG can be sourced from
- California currently imports ~90% of fossil gas
- CARB needs to remain open to displacing these fossil imports with imported RNG, even as in-state supply scales.
- RNG opponents desire to create administrative complexities to artificially increase costs or impose barriers to RNG use. CARB should not be swayed by such arguments.
- The proposed rule disincentivizes out-of-state RNG development, distracts from the legitimacy of RNG's environmental benefits, and turn a key advantage of RNG (it's compatibility with the existing gas system) into a perceived weakness.

RNG Coalition Position: Diminishing LCFS RNG incentives or changing geographic eligibility for RNG slows clean fuel progress and delays needed methane emission cuts

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Broad Concluding Considerations

- Circular Economy – Recycling waste resources (e.g., manure) to create a circular economy
- Sustainability – Can RNG production facilities help facilitate broader opportunities at dairies?
- Carbon Neutrality/Negativity – West coast moving toward full carbon neutrality
  - 100% clean energy inputs
  - Maximizing methane reductions
  - Use of carbon capture and storage?
- West coast programs continue to evolve
  - Increased ambition of clean fuel programs is likely
  - Wrestling with changes to proven purchasing practices for RNG/renewable energy
  - Cross-sectoral programs still have vocal opponents

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