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**21-IEPR-03 Comments by Clean Energy on December 2, 2021
Workshop, Session 2**

Additional submitted attachment is included below.



December 16, 2021

Commissioner Andrew McAllister
Vice Chair Siva Gunda
California Energy Commission
1516 9th Street
Sacramento, CA 95814

**Re: CEC Docket 21-IEPR-03;
Comments by Clean Energy on the December 2, 2021 Workshop, Session #2**

Dear Commissioner McAllister, Vice Chair Gunda, and Commission Staff:

Clean Energy appreciates the opportunity to comment on the December 2, 2021, Session #2 Integrated Energy Policy Report (IEPR) Workshop on transportation electrification forecasts and annual end-user electricity and gas demand (referred to as the Workshop). The recommendations provided here recognize the significant efforts of the California Energy Commission (Commission) staff (Staff) in their detailed analysis and forecasts in preparation for the next IEPR cycle.

I. INTRODUCTION

These comments emphasize the following point: ***the Commission's transportation forecast analysis should separately measure and forecast renewable natural gas (RNG) as a fuel source given its critical role in decarbonization of the medium-duty and heavy-duty (MDHD) sector through mid-century.*** Not doing so is a key oversight and will hinder progress in the near- to mid-term.

Inclusion of RNG in the near- and mid-term is key to reducing Short Lived Climate Pollutants (SLCP) and GHG emissions to the greatest extent possible. Clean Energy thus reiterates its support for the adoption of electric vehicles, particularly heavy-duty vehicles by fleets and owner-operators, but emphasizes again that empirical data and reports from OEMs confirm that these vehicles will not be commercially viable for a decade, if not longer. Clean Energy accordingly urges the review of RNG and the development of gas analytical tools to inform policymaking to immediately, and continue in the near- to mid-term, displace heavy-duty diesel trucks. The Commission should revise its forecasts to include the following key points:

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- ❖ The transportation forecast in the Commission’s demand scenarios project should be sufficiently granular to allow agencies to calculate and forecast potential GHG reductions from substituting RNG for diesel in the MDHD sector.
- ❖ Measuring and providing a forecast of RNG as a fuel source sheds light on potential air quality benefits and permits policymakers to promote policies that encourages GHG reductions in the MDHD sector, especially among heavy-duty trucks.

As noted our prior comments, since 2011, Clean Energy has been fully committed to expanding the use of RNG in the transportation sector and, more broadly, as a drop-in fuel for the natural gas grid. Clean Energy stands ready to work with State agencies to continues its clean energy efforts. Given that these scenarios will be considered in preparing next year’s IEPR cycle, significant opportunities exist for measuring RNG as a subset of natural gas-fueled MDHD vehicles to set the foundation for future analysis. As the Commission notes, “massive reductions in GHG emissions are need by mid-century,” and understanding “energy demand and the pattern of change from one energy form to another is critical to assuring reliability for each energy form.”¹ In the MDHD sector, RNG plays a critical role in not only reducing, but **removing** GHG from the atmosphere through carbon capture.

II. COMMENTS

The 2021 Draft IEPR Report specifically describes certain difficult-to-electrify fleets as using liquid or gaseous combustion fuels “for years to come.”² It refers to a “success story” example of a dairy farm creating drop-in RNG for MDHD vehicles that also **reduces** methane, nitrogen oxides, and hydrogen sulfide previously released into the air.³ To reiterate, RNG production can result in **negative** GHG emissions because it reduces the GHG in the atmosphere under the California Air Resources Board (CARB) Low Carbon Fuels Standard (LCFS) program.⁴

¹ CEC Demand Scenarios Project presentation, slide 3, available at <https://www.energy.ca.gov/event/workshop/2021-12/session-2-iepr-commissioner-workshop-electricity-and-natural-gas-demand>.

² Draft 2021 Integrated Energy Policy Report, Appendix at p. 20, available at <https://www.energy.ca.gov/data-reports/reports/integrated-energy-policy-report/2021-integrated-energy-policy-report>.

³ Id., Appendix at p. 21 (referring to the California Bioenergy, LLC, Kern Dairy Cluster Biomethane Upgrading Facility).

⁴ Id., Appendix at p. 20 (“Furthermore, waste-based feedstocks are quite low in life-cycle greenhouse gas (GHG) emissions, to the point that CARB’s Low Carbon Fuel Standard (LCFS) currently counts some fuel from these sources as a net negative source of GHG emissions.”).

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Depending on the source of the RNG, if only 200 trucks out of a 1,000-truck fleet are converted from diesel to RNG, the entire fleet would be carbon neutral due to the GHG reduction from the 200 trucks running on RNG.

A. While MDHD Electrification Progresses, RNG Provides an Immediate Opportunity to Reduce Reliance on Diesel in the MDHD Sector, Which Is Especially Important as Both Vehicle Miles and the Purchases of Trucks Are Expected to Increase Through 2035

As Staff observed, “diesel dominates” the MDHD vehicle sector in 2020, and through 2035.⁵ The Transportation Energy Demand Forecast presentation showed that in 2020, 16% of the transportation sector was comprised of MDHD vehicles.⁶ Distribution by fuel type shows that 19.3% of fuel was sourced by diesel in 2020.⁷ While Staff noted that in 2035 one sees a little more electricity in the MDHD sector, diesel remains steady.⁸ As explained in Section II.B, the deep-seated prevalence of diesel as a fuel for trucks emphasizes the importance of shifting from diesel engines to RNG engines (commercially available now) in the MDHD sector.

In showing the natural gas demand forecast,⁹ Staff observed that natural gas demand grows through 2025, then begins to decrease through the 2030s due to increased electrification and fuel substitution in trucks. Even with the decrease forecast through the 2030s, natural gas usage for transportation is expected to remain above 200 million therms.¹⁰ In a similar vein, Staff explains that even as MDHD vehicle stock increases, energy consumption declines due in part to increased efficiency of internal combustion engines. Yet even through 2035, over 350 trillion BTUs are expended for truck, buses, and motorhomes. Again, despite forecasted decreases in the next decade and a half, a sizeable opportunity exists to substitute the natural gas-fueled trucks with RNG, which is a drop-in replacement fuel for natural gas.

In the Medium and Heavy-Duty Fuel Forecast presentation, Staff explained that vehicle miles traveled (VMT) is a good indicator for fuel use.¹¹ Due to goods movement and general services,

⁵ Transportation Energy Demand Forecast presentation, slide 4, available at <https://www.energy.ca.gov/event/workshop/2021-12/session-2-iepr-commissioner-workshop-electricity-and-natural-gas-demand>.

⁶ Id. at slide 3.

⁷ Id.

⁸ See id. at slide 4.

⁹ Id. at slide 8.

¹⁰ Id.

¹¹ Medium and Heavy-Duty Fuel Forecast presentation, slide 8 (titled Truck and Total MD-HD Vehicle Miles), available at <https://www.energy.ca.gov/event/workshop/2021-12/session-2-iepr-commissioner-workshop-electricity-and-natural-gas-demand>.



truck miles are expected to increase significantly between 14-30% in 2035, compared to MDHD vehicle miles driven in 2021.

Staff explained that to satisfy the demand for the increased VMT, new trucks will be purchased. In 2021, approximately 930,000 to 940,000 trucks and approximately 1.1 million total MDHD vehicles were driven on California roads.¹² By 2035, between 1.2 million to 1.36 million trucks and 1.37 million to 1.51 million total MDHD vehicles are expected to be on California roads.¹³ The purchase of new trucks follows a similar trajectory, with 21,000 to 26,000 new trucks expected to be purchased in 2021, rising to between 52,000 to 64,000 as we approach 2035.¹⁴ Essentially, the MDHD sector remains a significant portion of vehicle miles driven and vehicles purchased, so efforts to address GHG reduction in the sector should be expanded beyond only electrification.

B. While RNG Is a Drop-In Fuel for Natural Gas, Depending on Its Source, RNG Removes Carbon from the Air and Should Be Measured, Especially for the MDHD Sector

At the start of the Workshop, Commissioner Monahan noted that the climate is at stake in emphasizing the importance of the applicability of the Commission’s forecasts, and supporting deeper analytical work on transportation measurements. Commissioner Monahan, Commissioner McAllister, and Vice Chair Gunda all agreed that the transportation forecasts provide an important opportunity for the gas analytical tools to be used in the policy realm, such as by other State agencies. The importance of reducing diesel has been referenced in previous IEPR reports, including the 2020 IEPR report, noting that “medium- and heavy-duty vehicles (which include vehicles such as school buses and garbage trucks) are the largest source of diesel particulate matter, the leading contributing factor to cancer caused by air pollution.”¹⁵

CARB data itself shows that RNG is the lowest carbon alternative fuel currently available. In implementing its Low Carbon Fuel Standard (LCFS) program, CARB measures a fuel’s carbon intensity, and provides the information on its website,¹⁶ which is compiled into the table below.

¹² Id. at slide 9 (titled MD-HD Stock Forecast).

¹³ Id. (titled MD-HD Stock Forecast).

¹⁴ Medium and Heavy-Duty Fuel Forecast presentation, slide 10 (titled New MD-HD Trucks Purchased), available at <https://www.energy.ca.gov/event/workshop/2021-12/session-2-iepr-commissioner-workshop-electricity-and-natural-gas-demand>.

¹⁵ 2020 IEPR Report at 2, available at <https://www.energy.ca.gov/data-reports/reports/integrated-energy-policy-report/2020-integrated-energy-policy-report-update>.

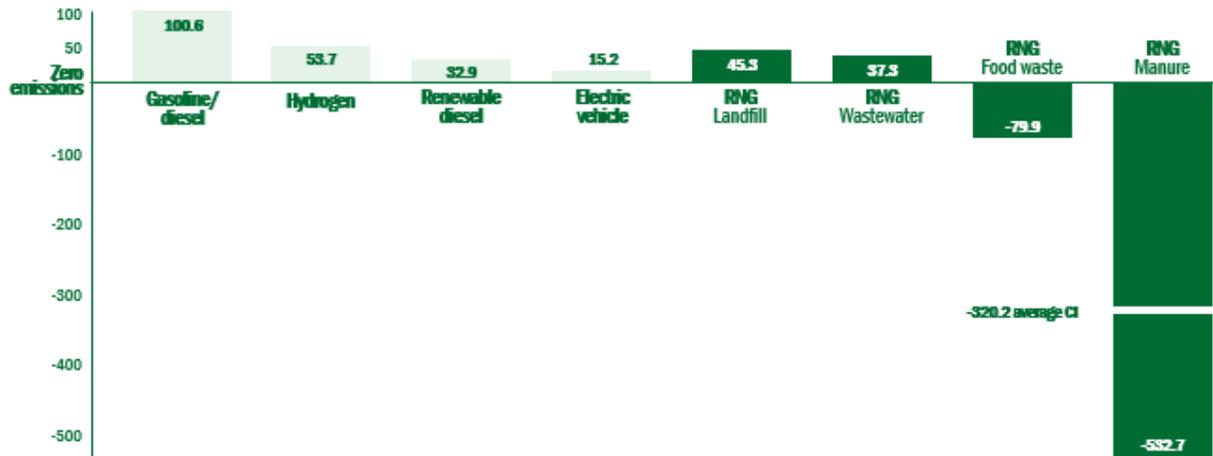
¹⁶ The inputs to this table are from CARB’s most recent quarterly reporting of the tab titled “Emissions per GGE,” available at https://ww3.arb.ca.gov/fuels/lcfs/dashboard/quarterlysummary/quarterlysummary_043021.xlsx.



RNG is the lowest carbon alternative fuel



Carbon emission by fuel type (gCO_{2e} per MJ)



Source: California Air Resources Board, Q4 2020 LCFS data, and certified pathways as of May 11, 2021.

As shown in the chart above, RNG-fueled vehicles have lower or negative carbon emissions, measured by CARB data. Electric vehicles result in 15.2 gCO₂ per megajoule, which is much higher than the negative emissions achieved by RNG from food waste or manure. RNG from food waste and manure is a MDHD fleet solution that should be recognized in the near-term. Clean Energy also works with existing dairy farms, and has spearheaded projects that have resulted in the significant reduction of air pollutants and odor.

C. Currently, the Transportation Energy Demand Forecast and Scenarios Do Not Separately Measure RNG Compared to Other Fuel Sources

The current transportation energy demand forecast and the demand scenarios do not separately measure RNG as a fuel source. Given the Commission’s focus on fuel substitution in these analyses¹⁷ over the next decade and a half, this is an oversight that must be remedied.

¹⁷ See Electricity and Natural Gas Demand Forecast presentation at slide 5, available at <https://www.energy.ca.gov/event/workshop/2021-12/session-2-iepr-commissioner-workshop-electricity-and-natural-gas-demand>.



For example, analysis of internal combustion engine MDHD stock includes gasoline, diesel, natural gas, propane, and both gasoline and diesel hybrids.¹⁸ A graph of zero-emission truck and bus stock include separate measurements of electric, hydrogen, and PHEV Diesel, but does not include RNG.¹⁹ In the transportation natural gas demand forecast, RNG is not separately measured from natural gas.²⁰

When Vice Chair Gunda asked how Staff is thinking about RNG elements in the transportation demand scenarios, the response given – that the base gas forecast becomes an important predictor of eventual electrification consequences – was unfortunately non-responsive.²¹ The base gas forecast does not address separately measuring RNG as a means for GHG reduction.

Breaking out forecasts and analytics for RNG would provide an opportunity to more effectively manage the transition away from, and reduction of, diesel as a MDHD fuel source. This opportunity should not be lost

III. CONCLUSION

Clean Energy appreciates the opportunity to provide these comments, and urges the Commission to separately analyze and measure RNG in its transportation energy demand forecasts.

Respectfully submitted,

CLEAN ENERGY

By

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¹⁸ Medium and Heavy-Duty Vehicle Forecast presentation, slide 12 (titled Internal Combustion MD-HD Stock), available at <https://www.energy.ca.gov/event/workshop/2021-12/session-2-iepr-commissioner-workshop-electricity-and-natural-gas-demand>.

¹⁹ Id. at slide 11 (titled Zero-emission Truck and Bus Stock).

²⁰ Transportation Energy Demand Forecast presentation, slide 8.

²¹ Workshop recording at approximately 1 hour, 45 min mark, available at <https://www.energy.ca.gov/event/workshop/2021-12/session-2-iepr-commissioner-workshop-electricity-and-natural-gas-demand>.

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