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RNG Coalition Comments on June 6 Staff Workshop on Natural Gas Infrastructure and Decarbonization Targets

Additional submitted attachment is included below.

June 21, 2019

Laurie ten Hope
Deputy Director
Research & Development Division
California Energy Commission
1516 Ninth Street
Sacramento, California 95814

RE: Staff Workshop - The Natural Gas Distribution Infrastructure and Decarbonization Targets

Dear Director Hope:

The Coalition for Renewable Natural Gas (RNG Coalition) is a California-based nonprofit organization representing and providing public policy advocacy and education for the Renewable Natural Gas (RNG or biogas-derived biomethane) industry. We advocate for the sustainable development, deployment and utilization of RNG, so that present and future generations have access to domestic, renewable, clean fuel and energy in California and across North America.

We do not claim to be able to solve the daunting challenge of decarbonization with a single fuel alone, but we know that RNG can—and should—be a significant contributor to this effort, because it is a cost-effective solution available at scale in the near-term.[1] The RNG Coalition respectfully submits these comments in response to the California Energy Commission (CEC) Staff Workshop on the Natural Gas Distribution Infrastructure and Decarbonization Targets Workshop held on June 6, 2019.

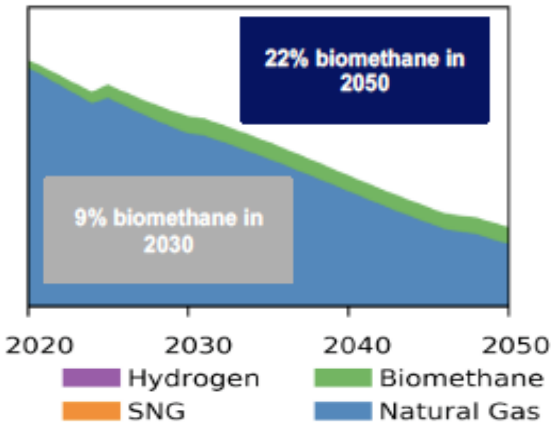
E3's Work Continues to Show the Complementary Nature of RNG Adoption and Building Electrification

We believe that all of the work done to date by Energy and Environmental Economics (E3) for CEC has demonstrated the importance of combining RNG with other

[1] We reemphasize that our goal is not to oppose other alternatives that may help to accomplish the changes in buildings needed to meet the State's ambitious climate goals, including building electrification where appropriate.

strategies to reduce greenhouse gas emissions in California.[2] Figure 1, excerpted from E3's slides presented at the workshop, shows a very significant amount of near-term biomethane use (9% of pipeline gas by 2030), even in the high electrification case.

Figure 1. E3's Updated Work Continues to Show High near-term RNG Penetration in Tandem with High Electrification[3]



We look forward to working with the Commission, other agencies, and all stakeholders to develop policies that best achieve this near-term RNG outcome. One policy that could be helpful in achieving this goal would be a Renewable Natural Gas Procurement Program as called for by Senate Bill 1440 (Hueso, 2018).[4]

Prior Evaluation by CEC Recognizes that the California RNG Supply Curve E3 is Using May Represent the Lower End of Credible Studies

Despite the fact that the near-term use of RNG is strong in the updated high-electrification scenario, E3 may be underestimating long-term biomethane potential.

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[2] Both E3's initial study entitled *Deep Decarbonization in a High Renewables Future* and the updated work entitled *Draft Results: Future of Natural Gas Distribution in California* have significant penetration of RNG in all scenarios. Those studies are available from:

https://www.ethree.com/wp-content/uploads/2018/06/Deep_Decarbonization_in_a_High_Renewables_Future_CEC-500-2018-012-1.pdf

https://www.energy.ca.gov/research/notices/2019-06-06_workshop/2019-06-06_Future_of_Gas_Distribution.pdf

[3] Figure from Slide 16 of E3's workshop deck highlighting the *High Electrification* case.

[4] Early versions of the SB 1440 legislation contained volumetric biomethane procurement targets that equate to levels well below a 9% pipeline blend by 2030. Since those targets did not make it into the final language, the California Public Utilities Commission has the discretion to set appropriate targets. Current and prior SB 1440 bill text here:
https://leginfo.legislature.ca.gov/faces/billVersionsCompareClient.xhtml?bill_id=201720180SB1440&cversion=20170SB144098AMD

The CEC's 2017 Integrated Energy Policy Report (IEPR) included a detailed discussion of RNG supply potential.[5] Table 20 of the IEPR made a direct comparison between the UC Davis Institute for Transportation Studies (UCD ITS) effort conducted by Jaffee et al.,[6] which we understand to be the basis of the California portion of E3's biomethane supply curves,[7] and other recent studies.

Comparing the total potential line in Table 20 of the IEPR for these three studies, the UCD ITS potential was listed as 82 billion cubic feet (BCF) and the other studies had a range from 105-351 BCF. The IEPR was also careful to correctly characterize the UCD ITS study as primarily focused on evaluating the *near-term economically feasible* potential at current levels of incentives rather than accurately estimating total long-run potential out to 2050.[8] We note this only to encourage CEC leadership and other stakeholders to appropriately interpret E3's work as conservative with respect to long-term RNG supply potential, especially from in-state sources.

Biomethane is a Cost-Effective Source of Greenhouse Gas Reductions Today. It Should Be Differentiated from Synthetic Natural Gases, which are Currently more Expensive but May Decline in Cost Over Time.

The final E3 work should more carefully consider any conclusions implying biomethane is not a cost-effective source of greenhouse gas emission reductions, including the following erroneous conclusion from their workshop deck:

> "Using renewable natural gas (RNG) to decarbonize buildings—with foreseeable technology—is an expensive strategy."[9]

This blanket statement is an over-simplification of the actual details of the supply curves in E3's work. Much of the biomethane included in E3's work is accessible at reasonable cost when evaluated on a dollar per metric ton CO_2e reduced basis, especially when compared to other available technologies to reduce emissions in the near term.

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[5] https://efiling.energy.ca.gov/getdocument.aspx?tn=223205, see Chapter 9.

[6] Jaffe, Amy Myers, Rosa Dominguez-Faus, Nathan C. Parker, Daniel Scheitrum, Justin Wilcock, and Marshall Miller. 2016. *The Feasibility of Renewable Natural Gas as a Large-Scale, Low Carbon Substitute*. Institute of Transportation Studies, University of California, Davis, research report. UCD-ITSRR-16-20. https://ww3.arb.ca.gov/research/apr/past/13-307.pdf

[7] *Deep Decarbonization in a High Renewables Future*, Page 10.

[8] Page 53 of the original UCD ITS study does list the total CA potential as 90.6 billion cubic feet per year.

[9] *Draft Results: Future of Natural Gas Distribution in California*, Slide 6.

Because the only RNG available commercially today is biomethane the terms "RNG" and "biomethane" are often used synonymously by some stakeholders. Therefore, E3's primary draft conclusion could easily be misinterpreted. To provide greater clarity we recommend that the conclusion be reworded and that the higher-cost synthetic gas be clearly differentiated from biomethane throughout E3's final report.

We also appreciate that the synthetic gas price estimates have fallen relative to E3's prior work due to collaboration with University of California Irvine (UCI) on the potential cost declines for these technologies. We'd like to see more detail as to any equivalent potential decline in biomethane technology costs. Historically, CEC has investigated biogas upgrading technology in significant detail through work conducted with the California Biomass Collaborative. This work could be revisited to provide some insights into long-run technology cost decline trends.[10]

We also suggest that accurately forecasting technology cost declines in nascent industries is extremely challenging and that it's possible that all renewable gases could conceivably be cheaper than E3 currently predicts in the out years once these industries reach appropriate scale.

The Use of Pipeline-connected RNG Resources Can Shift Over Time

Natural gas demand reduction (including through electrification) and increased RNG use are complementary and both will be necessary to hit deep decarbonization goals. Further, as demand shifts RNG supply can flow to different end uses over time. The near-term reality is that RNG demand from transport in California is becoming saturated[11] due to successful decarbonization policies in that sector. Unfortunately, no significant policy drivers exist for RNG use in sectors such as industry or buildings.

As noted in prior comments,[12] E3's previous High Electrification scenario shows significant near-term remaining natural gas demand in buildings, due in large part to the time it takes to turn over the stock of long-lived appliances. It also shows demand in transport for natural gas growing slowly over time. Therefore, it should be possible to develop the RNG resource today by supporting its sustainable use in buildings and then shift it, over time, to use in transport or industry, as prudent.

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[10] https://biomass.ucdavis.edu/wp-content/uploads/Biogas-Cleanup-Report_FinalDraftv3_12Nov2014-2.pdf

[11] See our prior March 11, 2019 Comments in CPUC Rulemaking 19-01-011 for more on how transport use is becoming saturated: http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M273/K147/273147188.PDF

[12] https://efiling.energy.ca.gov/GetDocument.aspx?tn=227835&DocumentContentId=59210

We request that in the final version of this work E3 explore lifting any arbitrary near-term limits on the use of RNG in building applications and evaluate a scenario where at least a modest share of the RNG resource is used in that sector. That could either allow RNG use to expand more quickly—due to additional incentives for near-term use in buildings—or it could represent a way of achieving the projected 9% of RNG in the pipeline by 2030 in tandem with longer-term electrification and efficiency efforts in the high-electrification scenario.

Air Quality Comparison Should be Presented with Appropriate Context Due to the High-Level of Heated Rhetoric Around These Issues

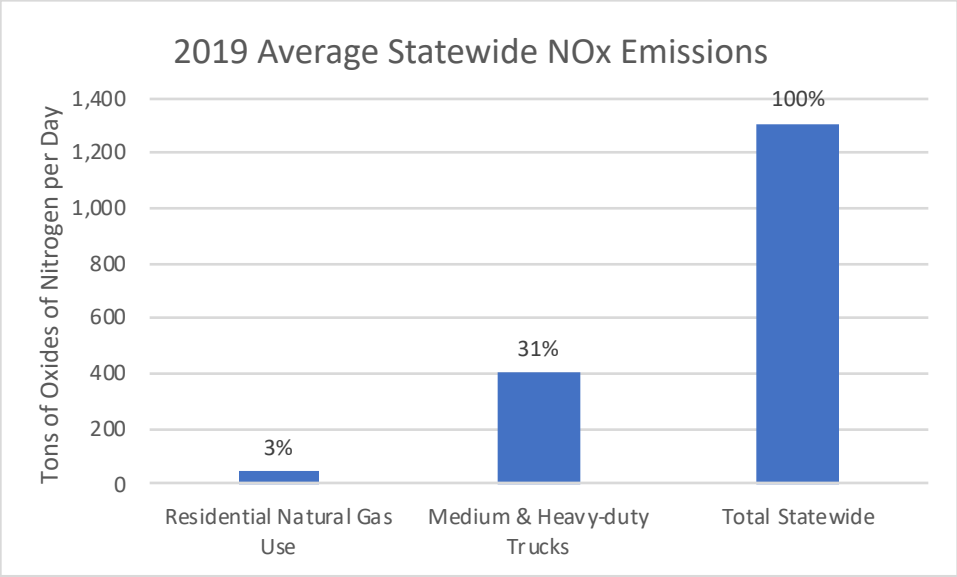
In prior comments[13] we have expressed concern that the emotionally-charged debate around building decarbonization left very little room for important dialogue about effective policy design to maximize GHG reduction and public health benefits. The tenor of the debate makes it even more critical that any air quality analysis on these issues be conducted rigorously and presented with adequate context for all stakeholders to understand and appropriately respond to.

With those goals in mind, the air quality analysis conducted by the UCI team should be improved and expanded to provide sufficient context. First, it should be transparent with respect to the fact that oxides of nitrogen (NOx) and direct particulate matter (PM) emissions from natural gas combustion for water/space heating and cooking in buildings are currently a very small share of the statewide emissions of these pollutants. For example, looking at the California Air Resources Board's (CARB) Criteria Pollutant Emissions Inventory, the average annual emissions of NOx from residential space heating, water heating, and cooking are expected to be 44 tons per day in 2019 as shown in Figure 2.[14] That is approximately 3% of the statewide total (1,307 tons/day). For direct emissions of $PM_{2.5}$, the contribution is even smaller, with these activities responsible for 5 tons/day out of a total of 933 tons/day statewide, or approximately 0.5%.

[13] Ibid.

[14] These numbers are derived using CARB's CEPAM tool to query the inventory. We selected "annual average", "oxides of nitrogen" (or "particulate matter < 2.5 microns"), "grown and controlled", "2019", "all sources", and "statewide" then downloaded the "more detailed" data to parse out residential natural gas fuel combustion. We summed the amounts from the residential space/water heating, cooking, and "other" residential categories (rows 1392, 1394, 1395 and 1396). CEPAM is available here: https://www.arb.ca.gov/app/emsinv/fcemssumcat/fcemssumcat2016.php

Figure 2. Natural Gas Use in Residential Buildings Represent a Small Share of Statewide NOx Emissions



Perhaps this is why the presentation from UCI of the air quality analysis quickly went beyond building electrification and included scenarios to reduce NOx and $PM_{2.5}$ emissions from trucks, which are a much more significant source of these pollutants. Regardless, the fundamental issue is that the relationship between the changes in these sectors shown in the UCI scenarios to the prior (and current) E3 work is unclear.

We request that the analytical team address these issues and make appropriate comparisons of the reductions achieved through building decarbonization to the long-run CARB State Implementation Plan goals for these pollutants, perhaps using CARB's inventory (including projections of benefits to occur due to existing measures). Without such a comparison it's much more challenging for stakeholders to make informed comments about the air quality impacts of natural gas decarbonization.

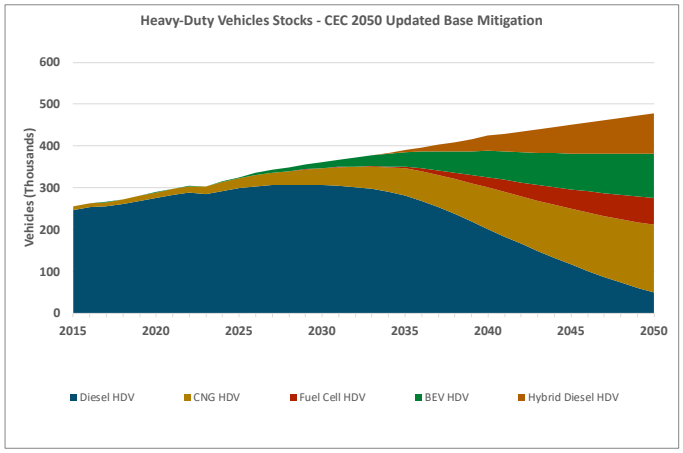
Further, as shown in Figure 3, E3's prior work predicts significant growth of low-NOx natural gas vehicles, but it is unclear how that matches to heavy-duty vehicle stock in UCI's scenarios.[15] It is also unclear as to how those estimates relate to CARB's recent plans to mandate a high penetration of heavy-duty zero emission vehicles in some applications historically served by large shares of natural gas vehicles.[16]

[15] RNG used in Low-NOx vehicles has significant criteria pollutant benefits relative to diesel engines. For example, see: https://ucrtoday.ucr.edu/wp-content/uploads/2018/08/CWI-LowNOx-12L-NG_v03.pdf

[16] For example, see:

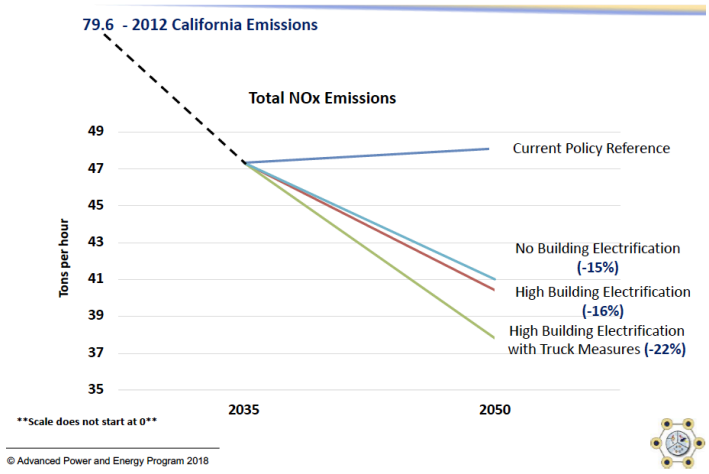
The Advanced Clean Truck Rule (under development): https://ww2.arb.ca.gov/resources/fact-sheets/advanced-clean-trucks-act-fact-sheet

Figure 3. Prior Work by E3 Predicts Slow Near-term Natural Gas Vehicle Penetration, but Significant Long-term Growth by 2050[17]



The E3 report makes a good case that building electrification can be a helpful tool for greenhouse gas reduction and the UCI work suggests it will have modest co-benefit contributions to efforts to improve local air quality. We suggest that the final report highlight this type finding using figures similar to those presented by UCI at the staff workshop.

Figure 4. The Air Quality Analysis Appears to Show Very Modest Near-term NOx Benefit from Building Electrification[18]



The Zero-Emission Airport Shuttle Regulation (proposed for adoption June 2019): https://ww2.arb.ca.gov/our-work/programs/zero-emission-airport-shuttle

The Innovative Clean Transit Rule (adopted in Dec 2018): https://www.arb.ca.gov/msprog/ict/ict.htm

[17] Directly reproduced from the E3 Spreadsheet entitled *PATHWAYS model: Transportation and Building Stock and Equipment Results* supporting the *Deep Decarbonization in a High Renewables Future* work. Available here: https://www.ethree.com/wp-content/uploads/2018/05/Stock_Charts_CEC-EPIC-GHG-Scenarios-clean-8Jan2018.xlsm

[18] *Draft Results: Future of Natural Gas Distribution in California*, Slide 37.

For example, Figure 4 is reproduced from UCI's presentation at the Workshop. It seems to imply essentially no change in NOx emissions due to building electrification before 2040, and less than a 1 ton per hour change in NOx due to building electrification by 2050 (on the order of ~2% if total emissions in 2050 are 41 tons/hour).[19]

We respectfully request that these issues be clarified as the Commission takes steps to decarbonize the natural gas infrastructure. RNG use in buildings may not have identical criteria pollutant reduction benefits as electrification, but those differences appear to be negligible, especially in the near term.

It's Possible to Design Policies that Allow Competition Between Sources of GHG Reductions in the Building Sector to Achieve Lowest-Cost Outcomes

If the criteria pollutant benefits of building electrification are small relative to RNG use, it may be useful to design policies that allow for both GHG abatement options to compete directly to help minimize the cost of reaching our decarbonization goals. California has established other successful policies that create competition across a variety of greenhouse gas reduction options. For example, the Low Carbon Fuel Standard (LCFS) and the Renewable Portfolio Standard are both technology-neutral, market-based program that reduce lifecycle greenhouse gas emissions of various sectors.

These programs have many years of proven success and the same concepts could be used to create a policy to promote cleaner options in buildings. The Commission, the CPUC and CARB, should examine if an LCFS-like analog for the building sector could be developed. If such an overarching program is established, the Commission should carefully examine how specific subprograms, such as those authorized by SB 1477 (Stern, 2018) and SB 1440 (Hueso, 2018), interact with other policies established to reach the overarching goals. If an overarching policy is not considered, at a minimum the interaction effects between these policies should be clearly evaluated and transparently presented to all stakeholders.

[19] A more significant NOx reduction appears to be occurring in Figure 4 due to changes in trucks but it unclear as to if this is intended to represent additional post-2035 policies layered on top of current measures and, if so, what vehicles are used in response to these policies.

Conclusion

Creating a balanced building decarbonization program that reduces methane by promoting RNG deployment as part of a portfolio of low carbon technologies is in-line with the State's work on the importance of reducing short-lived climate pollutants.[20] It is also supported by recent legislative direction, including the requirement for the CPUC to evaluate a RNG procurement standard under SB 1440. Artificial conflict between building decarbonization and RNG use is not productive but fair competition between these options may prove helpful for cost minimization.

We appreciate that the Staff Workshop supported a broader dialogue on building decarbonization issues. We respectfully ask the CEC to work with its sister agencies to create a well-designed policy framework that promotes the use of RNG as one of many important options to help decarbonize buildings in California. Additional debate about the best long-run use of the RNG resource, while important, should not delay action to capture and use biomethane sustainably today.

Thank you very much for your consideration of these comments. Please do not hesitate to contact me directly with any questions or concerns.

Sincerely,

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Coalition for Renewable Natural Gas
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Sacramento, CA 95814
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[20] https://www.arb.ca.gov/cc/shortlived/meetings/03142017/final_slcp_report.pdf