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Earthjustice and Sierra Club Comments on April 8 Workshop

Additional submitted attachment is included below.

April 22, 2019

Submitted via electronic commenting system

California Energy Commission
Docket Unit, MS-4
Re: Docket No. 19-IEPR-06
1516 Ninth Street
Sacramento, CA 95814

Re: Docket 19-IEPR-06, Earthjustice and Sierra Club Comments on April 8th Joint Agency Workshop on Building Decarbonization

Earthjustice and Sierra Club appreciate the opportunity to comment on the April 8th Joint Agency Workshop on Building Electrification. As the California Energy Commission ("CEC") determined in its 2018 Integrated Energy Policy Report Update ("2018 IEPR Update"), "[t]here is a growing consensus that building electrification is the most viable and predictable path to zero-emission buildings."[1] In its workshop presentation, Southern California Gas Company ("SoCalGas") made a series of highly misleading claims to suggest that non-fossil sources of gas are an available, cost-effective means to decarbonize the building sector. As the 2018 IEPR Update concluded, "[r]enewable gas can be a part of the solution to reducing GHG emissions from buildings, but the role is likely to be constrained."[2] This characterization is generous. Biomethane potential in California is less than four percent of total gas demand and production of additional non-fossil sources of methane through synthetic means would be extremely costly and of little to no climate benefit. Accordingly, biomethane is best reserved for difficult to electrify applications, such as high-temperature industrial processes, rather than the building sector where electric alternatives are readily available. SoCalGas' efforts to derail meaningful climate progress are without merit and a threat to the health and safety of Californians. We urge the CEC and California Public Utilities Commission ("CPUC" or "Commission") to continue the critical work of removing barriers to building electrification and enable the resulting climate, air quality, public health, and economic benefits of zero emission buildings.

[1] CEC, Final 2018 Integrated Energy Policy Report Update Vol. II at 20 (Jan. 2019), Docket No. 18-IEPR-01, https://efiling.energy.ca.gov/getdocument.aspx?tn=226392.
[2] *Id.*

1. The CEC has Already Correctly Determined that the Role of Biomethane in Decarbonizing Buildings is Limited by Availability, Cost, and Leakage Concerns.

The 2018 IEPR Update determined that the role of biomethane in the decarbonization of the building sector is "likely to be constrained by limitations on renewable gas availability, cost, and ongoing methane leakage concerns."[3] Studies cited by SoCalGas in its April 8 workshop presentation not only reinforce this conclusion, but also underscore the importance of using the limited potential supplies of biomethane in sectors that are more difficult to electrify than buildings.

In its presentation, SoCalGas refers to three studies for the proposition that biomethane potential in California is between 94 and 300 BCF.[4] The first reference is to a study by UC Davis that found 90.6 (not 94) billion cubic feet per year (bcf/y) of biomethane is "technically producible" from landfill gas, dairy manures, municipal solid waste, and wastewater treatment plants.[5] This total includes supplies of biomethane that the study's authors considered "prohibitively expensive," with only 82 bcf/y "attractive for private investment," even after accounting for incentives from both California's Low Carbon Fuel Standard and the federal Renewable Fuel Standard program.[6] As illustrated in the graph below, the study determined that biomethane costs "swing sharply upward at about 70 bcf/y" because potential additional supplies represent smaller or more remote sources and therefore are significantly more costly to capture.[7]

[3] *Id.*
[4] CEC, Presentation by George Minter of Southern California Gas Company (TN#227583) ("SoCalGas Presentation") at Slide 8 (Apr. 9, 2019), Docket No. 19-IEPR-06, https://www.energy.ca.gov/2019_energypolicy/documents/2019-04-08_workshop/2019-04-08_presentations.php.
[5] Amy M. Jaffe *et al.*, *The Feasibility of Renewable Natural Gas as a Large-Scale, Low Carbon Substitute*, STEPS Program, Institute of Transportation Studies, UC Davis (2016), at 75, https://ww3.arb.ca.gov/research/apr/past/13-307.pdf.
[6] *Id.* at ix, 53-54.
[7] *Id.* at 53-54.

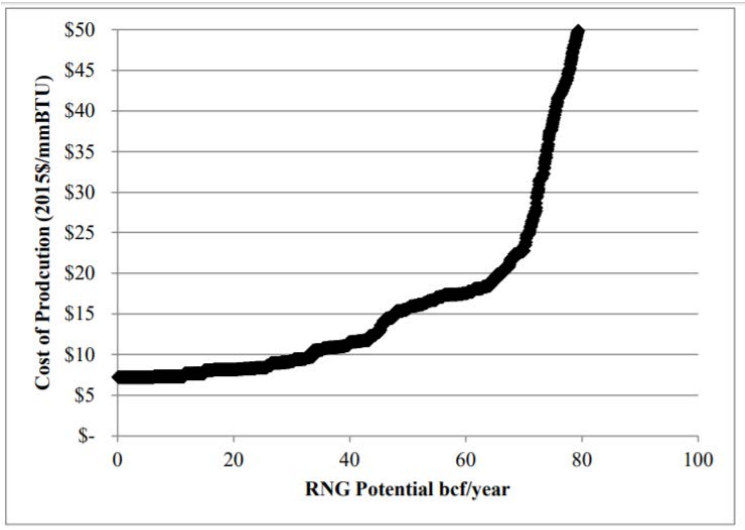

Figure 29. Combined source supply curve of RNG

In comparison to the 70-82 bcf/y of biomethane where capture is economically feasible when accounting for substantial existing subsidies, California's natural gas consumption in 2017 totaled over 2,110 bcf/y.[8]

Natural Gas Consumption by End Use
(Million Cubic Feet)

Area: California ▼ Period: Annual ▼

Download Series History | Definitions, Sources & Notes

Show Data By: ◉ Data Series ○ Area | Graph | Clear

	2013	2014	2015	2016	2017
Total Consumption	2,415,571	2,339,392	2,301,217	2,172,889	2,110,829
Lease and Plant Fuel					
Lease Fuel	49,846	42,989	43,838	40,830	41,817
Plant Fuel	2,834	2,361	1,861	1,545	1,400
Pipeline & Distribution Use	10,471	23,208	17,295	22,112	19,319
Volumes Delivered to Consumers	2,352,421	2,270,834	2,238,223	2,108,402	2,048,294
Residential	481,773	397,489	401,172	411,828	431,005
Commercial	254,845	237,675	235,791	236,967	237,360
Industrial	775,969	788,817	777,102	774,503	760,661
Vehicle Fuel	14,121	15,331	18,225	19,086	22,096
Electric Power	825,713	831,522	805,933	666,017	597,171

Accordingly, economically feasible biomethane potential in California represents less than four percent of total gas demand under the UC Davis study.

[8] U.S. Energy Information Administration, *Natural Gas Consumption by End Use* (Release Date: Mar. 29, 2019), https://www.eia.gov/dnav/ng/ng_cons_sum_dcu_SCA_a.htm.

The other studies referenced by SoCalGas inflate biomethane potential by assuming conversion of fuel sources that do not normally generate methane. As an initial matter, the methodology of the report by the consultancy ICF International, which finds 104 to 208 bcf/y of potential biomethane, is not sufficiently explained, stating only that its estimates were determined through review of other studies on biomethane supply (from which ICF's estimates differ markedly) and based on "other resources" that are not identified.[9] More to the point, the ICF estimate is not limited to biomethane from waste and includes agricultural and forestry product residue.[10] Similarly, the U.S. Department of Energy's "Billion Ton Report," referenced for the claim that 1,000 bcf/y of biomethane is available nationally, includes both biomass and fuels derived from algae in its potential estimates.[11] SoCalGas' further claim that a UC Davis/CEC Study concluded that biomethane potential in California was 300 bcf/y appears to refer to a draft study, actually authored by the California Biomass Collaborative, which assumes an enormous amount of biomass conversion.[12] These products do *not* normally decompose in an anaerobic environment and create fugitive methane, so using them to manufacture methane creates methane where none would otherwise have existed. California's climate policies such as SB 1383 are properly focused on reducing existing sources of methane, not creating new ones.

Moreover, because methane is a pollutant with a high global warming potential, creating new sources of methane can increase overall emissions "due to methane leaks and venting that occurs throughout the RNG supply chain."[13] In addition to failing to provide a climate benefit, manufacturing methane from agricultural waste, energy crops or woody materials from forests is incredible costly due to both the costs of collecting these materials and converting them to

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[9] SoCalGas Presentation at Slide 8; Philip Sheehy & Jeffrey Rosenfeld, *Design Principles for a Renewable Gas Standard*, ICF International, at 8 (Dec. 19, 2017), https://www.icf.com/resources/white-papers/2017/design-principles-for-renewable-gas.

[10] *Id.* at 8.

[11] SoCalGas Presentation at Slide 9; U.S. Department of Energy, *2016 Billion-Ton Report* (July 2016), https://www.energy.gov/eere/bioenergy/2016-billion-ton-report. A crucial component of California's climate strategy is its ability to spread to other states. Any policy that requires California to commandeer more than its population-weighted share of national biomethane is not a scalable solution. Furthermore, an approach that relies on paper transactions for biomethane produced thousands of miles from California presents serious reshuffling problems and is not a credible climate strategy. California's population-weighted share of the national supply estimated by the Department of Energy study (11%), even ignoring the methodological flaws of the report, would be only 110 bcf/y.

[12] SoCalGas Presentation at Slide 8. While the presentation does not provide a citation to the source of the 300 bcf/y claim, this appears to be the only CEC report that comes close to matching the limited information provided by SoCalGas. California Biomass Collaborative, *An Assessment of Biomass Resources in California, 2013 (Draft)* (Mar. 2015), https://biomass.ucdavis.edu/wp-content/uploads/CA_Biomass_Resource_2013Data_CBC_Task3_DRAFT.pdf. (including disclaimer that the "report has not been approved or disapproved by the California Energy Commission nor has the California Energy Commission passed upon the accuracy or adequacy of the information").

[13] Rebecca Gasper & Tim Searchinger, *The Production and Use of Waste-Derived Renewable Natural Gas as a Climate Strategy in the United States*, World Resources Institute, at 16 (April 2018), https://www.wri.org/publication/renewable-natural-gas.

methane through thermal gasification. The Natural Petroleum Council estimates the cost of methane production at smaller biomass gasification facilities at $40+/MMBtu, close to 15 times the current cost of fossil gas.[14] Accordingly, studies referenced by SoCalGas that include biomass conversion to estimate biomethane potential should be ignored and the Commission should consider biomethane potential in California to be no more than four percent of total gas demand.

2. Buildings Are Not a Strategic Use of Limited Biomethane Supply.

Given its limited potential, biomethane should be reserved for applications that cannot currently be feasibly electrified. Residential and commercial heating is not a good use of biomethane because direct use of renewable electricity is more efficient. For temperatures ranging from 75 degrees up to 140 degrees Celsius, heat pumps are currently the most effective option to meet heating demand.[15] A study commissioned by the European Gas Association admits that not only can electricity supply all the functionalities of residential and non-industrial commercial buildings, but "also can provide the low and medium temperature demands of many industrial processes."[16]

By contrast, electrification is less cost-effective in certain high process heat industrial applications.[17] Decarbonizing these processes remains a challenge: even if we leveraged California's entire sustainable biomethane potential for industrial applications alone, the sector would be far from fully decarbonized.[18] In contrast with residential and commercial heating, it is uncertain when high temperature electric technologies will become more cost-effective.

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[14] National Petroleum Council, *Renewable Natural Gas for Transportation: An Overview of the Feedstock Capacity, Economics, and GHG Emission Reduction Benefits of RNG as a Low-Carbon Fuel*, at 14 (Aug. 1, 2012), https://www.npc.org/FTF_Topic_papers/22-RNG.pdf. The Henry Hub Natural Gas Spot Price on April 15, 2019 was 2.75 $/MMBtu. Henry Hub Natural Gas Spot Price, YCharts, https://ycharts.com/indicators/natural_gas_spot_price.

[15] Agora Energiewende, Agora Verkehrswende, and Frontier Economics, *The Future Cost of Electricity-Based Synthetic Fuels* at 14 (Sept. 19, 2018), https://www.agora-energiewende.de/fileadmin2/Projekte/2017/SynKost_2050/Agora_SynKost_Study_EN_WEB.pdf. The efficiency and capability of heat pumps technology is constantly improving. *See, e.g.*, Ryosuke Suemitsu, *Performance of centrifugal chiller and development of heat pump using a low-GWP refrigerant*, Heat Pumping Tech. Mag., Vol. 36, No. 3 at 27 (2018) (Mitsubishi heat pump system capable of producing pressurized hot water at 200 degrees C).

[16] Timme van Melle *et al.*, *Gas for Climate: How Gas Can Help to Achieve the Paris Agreement Target in an Affordable Way*, Ecofys, at 7 (Feb. 15, 2018), https://gasforclimate2050.eu/files/files/Ecofys_Gas_for_Climate_Report_Study_March18.pdf.

[17] Agora Energiewende, *supra* note 15, at 14.

[18] U.S. Energy Information Administration, *supra* note 8. The Industrial sector consumed 760,661 million cubic feet of natural gas in 2017, the last year with full data available. Optimistic estimates of California's biomethane potential are 90.6 bcf, or 90,600 million cubic feet. *See, e.g.*, Jaffe *et al.*, *supra* note 5, at xi.

SoCalGas' efforts to direct California's potential supply of biomethane to the building sector is contrary to any holistic and effective climate strategy.

3. SoCaGas' Assertion that Use of Biomethane Provides the Greenhouse Gas Benefits of Building Electrification at Lower Cost Does Not Withstand Scrutiny.

Citing to a report it commissioned by Navigant Consulting, SoCalGas's workshop presentation claims that replacing less than 20 percent of fossil gas in the system with biomethane would provide the same greenhouse gas reduction at lower cost than "100% Building Electrification."[19] As an initial matter, SoCalGas's statement is a glaring misrepresentation of the study's conclusions: the study actually concludes that this level of biomethane substitution achieves equivalent greenhouse gas reductions to replacing 87% of gas appliances with electric versions by 2030.[20] It is further noteworthy that the Navigant report contains what appears to be a highly unusual disclaimer that the study authors do "not make any representations or warranties of any kind with respect to . . . the accuracy or completeness of the information . . . the presence of absence of any errors or omissions . . . [or] any conclusions" in their report.[21] Indeed, the report is replete with grossly biased assumptions designed to make continued gas combustion appear like a viable and cost-effective climate solution. Sierra Club and the Natural Resources Defense Council have pointed out many of the omissions and biased assumptions in this report in past IEPR comments, including unrealistic assumptions of biomethane supply, ignoring methane leakage, assuming worst case efficiency for electric appliances and best gas efficiency for gas counterparts, and using unsupported and inflated cost estimates for the upfront cost of electric appliances.[22] In fact, the study assumes use of more biomethane by SoCalGas than feasibly available in the entirety of California (140 bcf/yr compared to the ~ 80 bcf/yr identified in the UC Davis study) and allocates it all to buildings in lieu of more difficult to electrify sectors.[23]

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[19] SoCalGas Presentation at Slide 7.

[20] *See* Navigant Consulting, *Analysis of the Role of Gas for a Low-Carbon California Future*, at vi, ix (July 24, 2018), https://www.socalgas.com/1443741887279/SoCalGas_Renewable_Gas_Final-Report.pdf (concluding that "Under the Normal Replacement 100% scenario, the same GHG emissions reductions can be achieved by gas appliances if 46% of building gas use comes from RG by 2030. This equates to 16% of total SoCalGas throughput coming from RG by 2030." p. ix. The Normal Replacement 100% scenario referenced in this quote is a scenario where, "[b]y 2030, 87% of the installed base [appliances] would be electric," not 100% as implied by the SoCalGas presentation. p. vi.).

[21] Navigant Consulting, *supra* note 20, at iii.

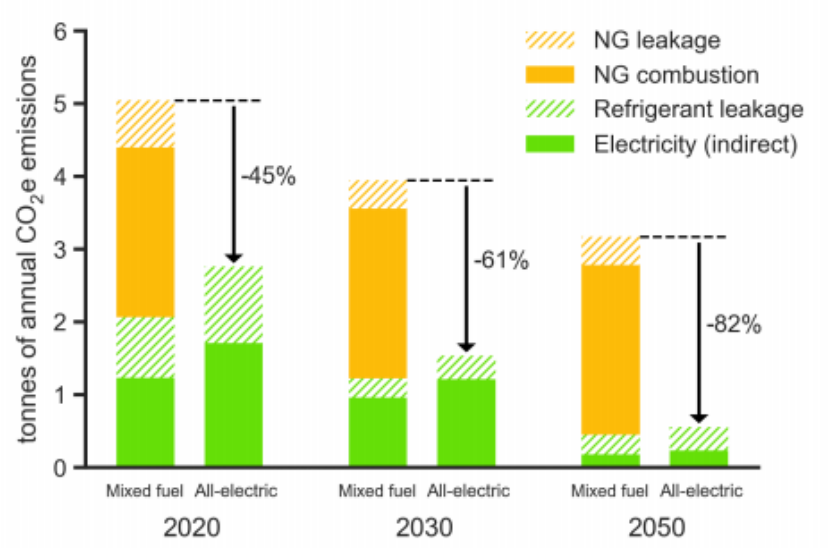
[22] *See, e.g.*, Sierra Club Comments on SoCalGas and Navigant Report (TN#224588) (Aug. 24, 2018), Docket No. 18-IEPR-09; NRDC Comments on Cost of Residential Electrification (TN#224592) (Aug. 24, 2018), Docket No. 18-IEPR-09. Documents available at https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=18-IEPR-09.

[23] Navigant Consulting, *supra* note 210, at ix, 7.

4. New Research Further Confirms Building Electrification is a Critical and Cost-Effective Climate Solution.

A recent study by E3, *Residential Building Electrification in California*, which in contrast to the Navigant report does not include a series of disclaimers by the study authors on its accuracy, further confirms building electrification offers cost-savings and enable significant greenhouse gas reductions that will increase as the grid becomes increasingly decarbonized.[24]

Figure 1-1: Annual GHG emissions from a mixed-fuel and all-electric 1990s vintage home in Sacramento



Consistent with prior research, the report confirms "that the electrification of buildings represents an important opportunity to reduce greenhouse gas emissions from buildings both in the near term and long term, and can lead to consumer capital cost savings, bills savings, and lifecycle savings in many circumstances."[25] The report makes the following recommendations to accelerate adoption:

1. Incentivize all-electric new construction and update the building code
2. Incentivize high-efficiency heat pump HVAC, particularly in areas with high air conditioning loads
3. Ensure efficient price signals are conveyed in electric and natural gas rates
4. Develop a building electrification market transformation initiative
5. Align energy efficiency goals and savings with GHG savings opportunities.[26]

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[24] Energy + Environmental Economics, *Residential Building Electrification in California* (Apr. 2019), https://www.ethree.com/wp-content/uploads/2019/04/E3_Residential_Building_Electrification_in_California_April_2019.pdf.
[25] *Id.*, Abstract.
[26] *Id.* at xiii.

We urge the CEC, in coordination with the CPUC, to move forward with these recommendations and enable California to achieve the climate, air quality, and economic benefits of building electrification.

Thank you for your consideration of these comments.

Respectfully submitted,

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