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Comments on Using Dairy Biogas for Electricity Production and as a Transportation Fuel

Exhibits submitted by email.

Additional submitted attachment is included below.

July 11, 2016

Via Online Submission

Robert B. Weisenmiller, Chair
California Energy Commission
1516 Ninth Street, MS-29
Sacramento, CA 95814-5512

Re: Comments on Using Dairy Biogas for Electricity Production and as a Transportation Fuel

Dear Chairman Weisenmiller:

The undersigned organizations submit these comments to advise you that avoiding methane generation and methane combustion remains the best course of action to mitigate methane from factory farm dairy facilities. The Energy Commission must evaluate the generation and use of biogas in the context of not only the 2030 reduction target called for in Senate Bill 32, but ultimately with the objective of meeting a 2050 target of 80 percent below 1990 levels. The policy adopted now must set the foundation for the policy necessary to meet that 2050 target.

Introduction

California's 2014 Gross Domestic Product was $2.13 trillion,[1] with 2014 California milk production accounting for $9.4 billion.[2] Accordingly, dairy accounts for 0.44 percent of California's economy, yet livestock manure management at dairies and enteric methane emissions represent 5.2 percent of California's 2013 greenhouse gas emission inventory.[3] Dairy thus contributes a vastly disproportionate share of greenhouse gas emissions compared to its overall contribution to the economy, especially when modifying the inventory data to account for methane's higher global warming potential in the short term 20-year period. The 2013 emissions inventory demonstrates that California dairies account for 45 percent of California's methane emissions, with manure management and enteric emissions accounting for 25 and 20 percent of total methane emissions, respectively.[4] In the San Joaquin Valley, which hosts the majority of industrialized factory dairies, *at least* eighty-seven percent of methane emissions are from dairy (and other cattle) operations.[5] Compared to the Aliso Canyon (Porter Ranch) natural gas storage leak, California dairies emit on average 2.3 times more per day than Aliso Canyon, and 1.45 times more per day at the Aliso Canyon's peak emissions rate.[6]

Combusting biogas to generate electricity at dairy facilities currently increases criteria pollutant emissions compared to a combined cycle natural gas power plant. Both electricity production and generation of biogas for use as a transportation fuel ignores the lifecycle emissions from dairy facilities. In other words, generating biogas includes the overall impacts on air and water quality from dairy operations in the San Joaquin Valley. Rather than subsidize a model of dairy production with negative externalities as a means to produce biogas, we call on the Commission to recognize that avoiding methane generation from manure management by promoting pasture-based dairy operations and composting manure represents the form of dairy production consistent with the 2030 and ultimately the 2050 decarbonized economy.

Anaerobic Digesters Harm San Joaquin Valley Communities.

San Joaquin Valley communities rank among the most disadvantaged communities in California because of social, economic, and environmental exposures to pesticides, air pollution,

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[1] California Legislative Analyst Office, July 1, 2015, available at http://www.lao.ca.gov/LAOEconTax/Article/Detail/90, attached as Exhibit 1.
[2] California Department of Food and Agriculture, available at https://www.cdfa.ca.gov/statistics/, attached as Exhibit 2.
[3] California Greenhouse Gas Inventory 2000-2013 (100 year GWP), available at http://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_2000-13_20150831.pdf, attached as Exhibit 3.
[4] Short Lived Climate Pollutant Reduction Strategy at 58.
[5] D.R. Genter, et al., Emissions of organic carbon and methane from petroleum and dairy operations in California's San Joaquin Valley, Atmos. Chem. Phys., 14, 4955–4978 (2014), attached as Exhibit 4.
[6] *See* Memorandum from Jonathan Sha to Brent Newell, February 9, 2016, attached as Exhibit 5. This memorandum relies on the IPCC's 4th Assessment methane global warming potential of 72 because that is the global warming potential the Board uses for this Proposed Strategy.

and groundwater contamination, among other factors. The close proximity of industrialized factory dairies to disadvantaged communities and location in the San Joaquin Valley air basin both contribute to localized and regional impacts. We are concerned that anaerobic digesters at these facilities will harm, rather than benefit, disadvantaged communities in the Valley.

Digesters have been and could be placed in already overburdened communities, with unhealthy air and contaminated drinking water. Dairy digesters will only exacerbate conditions in disadvantaged communities and further degrade the water and air quality in these communities by emitting air pollutants and through unlined liquefied manure storage lagoons and application to feed crops. Placing these facilities in these communities will bring in heavy-duty vehicle traffic and increase noise levels. Digesters increase vehicle miles traveled as well as levels of harmful short-lived climate pollutants such as black carbon from diesel truck emissions. Fresno County, for example, ranks second in the nation for short-term fine particle pollution (PM2.5), with asthma rates more than three times the national average.[7] Bakersfield ranks as the worst for both short-term and long-term PM2.5 exposure.[8]

Other issues that arise with the placement of dairy digesters in disadvantaged communities, include degraded transportation infrastructure, contamination of groundwater supplies, and increased levels of harmful air pollutants. Rural communities already lack the services and funding to improve transportation infrastructure, and the placement of these digesters would lead to an overuse of already substandard road infrastructure and further deteriorate the roads and highways of disadvantaged, underfunded communities.

Furthermore, the operation of dairy digesters results in nitrogen-rich digestate that negatively affects groundwater through unlined lagoons, over-application of nitrogen to crop fields, and volatized ammonia gas, which acts as a precursor to ammonium nitrate, the most prevalent form of PM2.5 in the Valley. Many nearby disadvantaged communities rely on groundwater for their water needs, and nitrate groundwater levels can reach unhealthy levels, causing such impacts as methemoglobinemia or "blue baby syndrome."

Combusting biogas in internal combustion engines for on-site electricity generation yields significant NOx, SOx, VOC, and particulate matter emissions that negatively affect air quality.[9] The. 2015 study "Assessment of the Emissions and Energy Impacts of Biomass and Biogas Use in California" finds that using current technology for biogas electricity generation results in a net increase of criteria pollutants. The current permitting of digesters by the San Joaquin Valley Unified Air Pollution Control District demonstrates and supports this study's findings when the District only requires internal combustion engines as Best Available Control Technology.[10] For example, a single dairy digester project – Lakeview Dairy – with two internal

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[7] American Lung Association, State of the Air 2016, available at http://www.lung.org/our-initiatives/healthy-air/sota/city-rankings/most-polluted-cities.html, attached as Exhibit 6.
[8] *Id*.
[9] Assessment of the Emissions and Energy Impacts of Biomass and Biogas Use in California (2015) ("Biogas Impact Assessment"), attached as Exhibit 7.
[10] *See, e.g.,* Notice of Preliminary Decision – Authority to Construct, Lakeview Dairy Biogas at 7, attached as Exhibit 8.

combustion engines producing 1,059 kw of electricity emits air pollution for which the facility does not need to purchase offsetting emission reduction credits.[11] This means that the digester adds pollution to the air basin.

One can reasonably extrapolate the impact from 25 dairies each emitting approximately 5.68 tons per year of NOx without obtaining any offsets. Considering the proposed 600 megawatt NGCC Avenal Power Center's maximum NOx emissions of 99.4 tons/year,[12] the dairies would generate 4.41 percent of the electricity Avenal generates yet emit more NOx, SOx, and VOC.[13] The Avenal Power Center had to buy offsets and the Lakeview Dairy did not.[14] This adds air pollution to the air basin, would displace cleaner power with dirty "renewable" dairy biogas, and negatively affect Valley communities.

Biogas as a transportation fuel does not justify its use. While substituting biogas for diesel may have benefits, the production of biogas under either an on-site electricity scenario or for transportation fuel does not address or mitigate the air and groundwater pollution issues the industry causes. Dairies are the largest source of VOC and ammonia. VOC from corn silage alone would be the largest source in the Valley, with dairy corn silage VOC emissions forming more ozone than the VOC emitted by passenger vehicles.[15] Creating public funding and subsidies to produce biogas has the perverse result in further subsidizing a form of milk production without correcting for externalized costs from that air pollution.

The June 27, 2017 workshop included discussion on the high level of public subsidies necessary to develop dairy biogas projects. Such public funding should not come at the expense of the health and well-being of communities in the San Joaquin Valley, nor should such funding perpetuate the existing pollution externalized on those communities.

To the extent that public funds should be further dedicated to the dairy industry, such funds should support conversions to pasture-based dairy operations or enhancements to existing pasture-based systems. Pasture achieves the co-benefits of avoided methane reductions when manure decomposes aerobically rather than anaerobically, when land is used for pasture forage than corn silage production, and with reduced enteric emissions fewer cows per acre for grazing compared to liquified manure systems. Furthermore, healthy grasslands sequester carbon in the soil and increase soil water retention.

Conclusion.

Reducing methane emissions to achieve immediate methane reductions requires a paradigm shift in California milk production from highly polluting, confined industrialized

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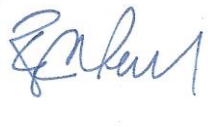
[11] *Id*. at 1, 20.
[12] Notice of Final Determination of Compliance, Avenal Power Center at 3, 27, attached as Exhibit 9.
[13] Digester/Avenal Comparison, attached as Exhibit 10.
[14] *Id.* at 38.
[15] Cody J. Howard, et al., Reactive Organic Gas Emissions from Livestock Feed Contribute Significantly to Ozone production in Central California, Environ. Sci. Technol. (2010), 44, 2309–2314, attached as Exhibit 11.

factory systems to high animal welfare, environmentally beneficial, pasture-based systems that achieve multiple co-benefits. The Commission should recognize the vast environmental impact associated with biogas development and use. Any public incentives should be directed towards pasture-based systems that reduce methane emissions, reduce corn silage emissions, and act as a carbon sink rather than to subsidize the use of polluting anaerobic digesters in the San Joaquin Valley. Thank you for your work to date and we look forward to working with you to ensure significant, equitable methane reductions from California dairies.

Sincerely,



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