February 26, 2024

Submitted Via Federal eRulemaking Portal

Internal Revenue Service
P.O. Box 7604
Ben Franklin Station
Washington, DC 20044

Re: <u>Comments On REG–117631–23</u>

To Whom It May Concern:

Thank you for the opportunity to comment on the above-referenced proposed regulation (the "proposed regulation"). We write to highlight the impacts of livestock biogas (biogas) on adjacent communities — which in California are disproportionately Latino/a/e and low-income — and to request revision to the proposed regulation to exclude hydrogen produced using dairy biogas from Section 45V credit eligibility.

These commenters are community-based, environmental justice, and environmental organizations that are deeply committed to tackling the climate crisis while ensuring that policies and programs do not exacerbate or perpetuate harm to low-income communities, communities of color, and disadvantaged communities. We envision and support investments, programs, and policies that create environmentally sustainable and just agricultural systems and truly clean energy solutions.

It is for these reasons that we oppose the inclusion of dairy biogas in the definition of "renewable natural gas." Section 45V tax credits were introduced as part of the Inflation Reduction Act which is touted as the "most significant action Congress has taken on clean energy and climate change in the nation's history."[1] Unfortunately, the proposed regulation would incentivize

[1] Inflation Reduction Act Guidebook, THE WHITE HOUSE (Sept. 21, 2023), https://www.whitehouse.gov/cleanenergy/inflation-reduction-act-guidebook/.

increases in greenhouse gas emissions and other pollution by providing tax credits, proportional to the amount of biogas created.

Below, we detail our concerns regarding the impacts of dairy biogas production, and answer certain questions posed by the Department of the Treasury (Treasury Department) and Internal Revenue Service (IRS).[2] For additional context and discussion, we also attach comments recently submitted to the California Air Resources Board opposing the inclusion of dairy biogas in the California Low-Income Fuel Standard.[3]

I. Dairy Digesters Negatively Impact Nearby Communities, Which In California Are Disproportionately Communities Of Color.

Biogas is often collected from large farms using manure digesters (digesters). Environmental justice groups have consistently shown that the use of digesters and subsidies for digesters are neither an equitable nor effective climate solution.[4]

As an initial matter, digesters have not proven to reduce total methane emissions from dairies. Digesters leak significant amounts of methane.[5] Thus without methane monitoring at digesters, modeling is unreliable and ineffectual. Additionally, digesters and digestate are sources of pollutants including ammonia, sulfur dioxide, nitrous oxides, and particulate matter and do not address pollutants other than methane.[6] Conversely, the methods used to make the capture, transport, and sale of factory farm gas economically viable, such as increasing herd sizes and collecting manure into covered lagoons, often increase the total emissions produced by dairies, including enteric methane emissions not captured by digesters.[7]

Further, programs that incentivize and monetize the production of manure also encourage dairies to grow larger and concentrate near biogas infrastructure. This concentration of dairy cows causes (a) increased discharge of nitrate groundwater within the localized zone of contribution;[8]

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[2] We do not answer all of the questions posed by the Treasury Department and IRS because several are not in the areas of focus or expertise of these commenters.

[3] *See* Exhibit A.

[4] ASIAN PACIFIC ENV'T NETWORK ET AL., Joint Environmental Justice Low Carbon Fuel Standard Letter (Mar. 15, 2023) available at https://www.arb.ca.gov/lists/com-attach/94-lcfs-wkshp-feb23-ws-UDpdNFE5VWgEdgJd.pdf.

[5] Semra Bakkaloglu et al., *Methane emissions along biomethane and biogas supply chains are underestimated*, 5 ONE EARTH 724–36 (2022).

[6] Rebecca Spector, *The Dairy Digester Dilemma: A False Climate Solution*, CTR. FOR FOOD SAFETY (Oct. 4, 2021), https://www.centerforfoodsafety.org/blog/6457/the-dairy-digester-dilemma-a-false-climate-solution.; Michael A. Holly et al., *Greenhouse gas and ammonia emissions from digested and separated dairy manure during storage and after land application*, 239 ECOSYSTEMS & ENV'T 410, 418 (Feb. 15, 2017), https://doi.org/10.1016/j.agee.2017.02.007.

[7] Spector, *supra* note 6.

[8] The Central Valley Summary Representative Monitoring Report presents years of monitoring data from forty-two Central Valley dairies chosen to be representative of the industry in the region. The report found elevated nitrate-N

(b) decreased groundwater levels within the localized cone of depression;[9] (c) increased air pollution, including exposure to ammonia, ozone, and fine particulate matter ("PM2.5");[10] (d) increasing and exacerbating impacts to odor and flies;[11] and (e) higher rates of the associated health impacts associated with these exposures.[12]

Ammonia is a toxic, odorous gas that can cause respiratory issues; irritation to the throat, lungs, and eyes; and lung damage. In addition to the health risks of ammonia exposure on its own, ammonia reacts with nitrogen oxides (e.g., NOx) and contributes to the formation of ammonium nitrate which contributes to PM2.5 levels. Exposure to PM2.5 is linked to premature deaths in people with heart or lung disease, heart attacks, irregular heartbeat, aggravated asthma, decreased lung function and long-term lung conditions including cancer. Dairies also emit volatile organic compounds that combine with NOx to create ozone. Ozone can cause a variety of respiratory illnesses, especially in children and for people who have asthma.

Large scale dairies contribute to nitrate groundwater contamination, mostly through application of manure to cropland, a practice that continues whether or not the manure is digested.[13] In fact, rather than mitigate nitrate contamination, the changed chemical composition of digestate post-digestion exacerbates nitrate leaching to groundwater, thus increasing the likely incidence and intensity of groundwater and drinking water pollution in communities near operations that use

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(*i.e.*, as nitrogen) concentrations were present beneath all monitored dairies. Dairies produce an "excess supply of nitrogen" in the form of manure than the amount that can be safely applied to cropland without causing or contributing to nitrate pollution. As more cows are concentrated on large dairies in the San Joaquin Valley, the problem will only intensify. Digesters do not solve this problem. Ninety-four percent of nitrate pollution is the result of application of manure to cropland, a practice that continues whether the manure is or is not digested. (*See* CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD & CENTRAL VALLEY DAIRY REPRESENTATIVE MONITORING PROGRAM, SUMMARY REPRESENTATIVE MONITORING REPORT at 6 (Apr. 1, 2019), https://leadershipcounsel.org/wp-content/uploads/2019/10/Dairy-report.pdf.)

[9] California's large dairies use an estimated 142 million gallons per day, or almost 52 billion gallons per year. (FOOD & WATER WATCH, BIG AG, BIG OIL AND CALIFORNIA'S BIG WATER PROBLEM, https://perma.cc/5UP6-9D62.); Concentration of dairy herds exacerbates localized impacts related to overdraft because more water used in one place creates a "cone of depression" in the groundwater basin. (Andy Louwyck et al., The Radius of Influence Myth, 14:2 WATER (Jan. 2022), https://perma.cc/3F3S-FS2N; see also University of Minnesota Extension, What Is a Cone of Depression, YOUTUBE (Jan. 11, 2021), https://perma.cc/5EXC-54CL.)

[10] *See* U.S. Envtl. Prot. Agency, Technical Support Document, Epa Evaluation Of Pm2.5 Precursor Demonstration, San Joaquin Valley Pm2.5 Plan For The 2006 Pm2.5 Naaqs; Standardized Regulatory Impact Assessment For The Low Carbon Fuel Standard 2023 Amendments B-2, Tbl 49 (Sept. 8, 2023), Https://Perma.Cc/9b8h-4abt.

[11] Residents who live near large dairies consistently report intense odors and swarms of flies, interfering with their use and enjoyment of their homes.

[12] *See, e.g.,* Sharma et al., "Health Effects Associated with PM2.5: a Systemic Review, Current Pollution Reports 6:345 (July 2020), https://link.springer.com/article/10.1007/s40726-020-00155-3; Ward et al., Drinking Water Nitrate and Human Health: An Updated Review 15:7 INT. J. ENV'T RES. PUB. HEALTH 1557 (2018), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6068531/; Roberto Picetti et al., Nitrate and Nitrite Contamination in Drinking Water and Cancer Risk: A Systematic Review with Meta-Analysis, 210 ENV'T RES. 112988 (July 2022), https://www.sciencedirect.com/science/article/pii/S0013935122003152; Nitrate Fact Sheet, CAL. DEPT. PUB. HEALTH (updated May 2014), https://perma.cc/C6SA-QKQF;

[13] CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD & CENTRAL VALLEY DAIRY REPRESENTATIVE MONITORING PROGRAM, *supra* note 8 at 10.

digesters and apply manure to fields.[14] Nitrate contamination disproportionately impacts small, rural, disadvantaged communities of color.[15] Rural, disadvantaged communities also tend to be very low-income[16] and pay on average three times the cost for water considered affordable by the U.S. Environmental Protection Agency.[17] In addition to polluting the groundwater, dairies also make it inaccessible for local communities. Industrial dairies use massive amounts of water including groundwater for supplying large amounts of drinking water to cows, liquefying and flushing manure and other pollutants for storage in lagoons, cooling animals, cleaning facilities, and irrigating crops. In addition, dairies rely upon water-intensive crops to feed dairy cows such as alfalfa. Low-income households, people of color, and communities already burdened with environmental pollution are disproportionately impacted by groundwater depletion.[18]

It is important to recognize that communities and households near and most directly impacted by large dairies that are installing digesters in California are disproportionately Latino/a/e.[19] Each of the top 10 counties for dairy production in California have a higher percentage of Latino/a/e/ residents than California as a whole[20] and about 99% of digesters installed with the help of California's biggest digester capital grant program are located in 7 of those 10 counties.

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[14] Paul Rosenfeld, Comments on the Proposed Amendments to the Low Carbon Fuel Standard 1–5 (Feb. 14, 2024); U.S. DEPT. AGRIC., NAT. RES. CONSERVATION SERV., CONSERVATION PRACTICE STANDARD CODE 366: ANAEROBIC DIGESTER (Aug. 2023) ("land application of digester effluent, compared with fresh manure, may have a higher risk for both ground and surface water quality problems. Compounds such as nitrogen, phosphorus, and other elements become more soluble due to anaerobic digestion and therefore have higher potential to move with water.").

[15] Carolina Balazs et al., Social Disparities in Nitrate Contaminated Drinking Water in California's San Joaquin Valley, 119:9 ENV'T. HEALTH PERSPS. (Sept. 2011), https://ehp.niehs.nih.gov/doi/full/10.1289/ehp.1002878.

[16] JONATHAN LONDON ET AL., UC DAVIS CENTER FOR REGIONAL CHANGE, THE STRUGGLE FOR WATER JUSTICE IN CALIFORNIA'S SAN JOAQUIN VALLEY: A FOCUS ON DISADVANTAGED UNINCORPORATED COMMUNITIES at 8–13 (Feb. 2018), https://perma.cc/XU6W-E86J.

[17] ELI MOORE ET AL., PACIFIC INSTITUTE, THE HUMAN COSTS OF NITRATE-CONTAMINATED DRINKING WATER IN THE SAN JOAQUIN VALLEY 7 (Mar. 2011), https://perma.cc/2WEL-2EGE.

[18] Balazs *supra* note 15.

[19] Joan A. Casey et al., *Climate Justice and California's Methane Superemitters: Environmental Equity Assessment of Community Proximity and Exposure Intensity*, 55 ENV'T SCI. & TECH. 14746 (2021), https://pubs.acs.org/doi/full/10.1021/acs.est.1c04328 ("Unadjusted models showed racial/ethnic and SES disparities in the odds of living in close proximity to methane superemitters and intensity of exposure based on multiple industry categories and total methane emissions. In adjusted models, the associations with race/ethnicity persisted …. Further, subanalyses restricted to dairies/manure management facilities and oil and gas production revealed similar racial disparities as the main analysis."); Sarah Brown Blake, Spatial Relationships among Dairy Farms, Drinking Water Quality, and Maternal-Child Health Outcomes in the San Joaquin Valley, 31:6 PUB. HEALTH NURSING (2014) ("ZIP codes with dairy cows had greater overall population ($p = .008$), higher total birth numbers ($p = .010$), and a larger percentage of births to mothers who identified as Hispanic ($p = .001$). In contrast, the percentage of births to mothers who identified as American Indian ($p = .004$), African American ($p = .002$), and White ($p = .012$) was significantly lower in ZIP codes with dairy farms.").

[20] According to Census data, California's population as a whole is 40.3% Hispanic identifying. The top 10 counties for dairy production, along with their respective percentage Hispanic population, are as follows: Tulare (67%), Merced (63.2%), Stanislaus (50.3%), Kings (57.3%), Kern (56.8%), Fresno (55%), San Joaquin (43.1%), Madera (60.8%), San Bernardino (56.2%), Riverside (52%). Data available at: U.S. Census Bureau, Quick Facts, https://www.census.gov/quickfacts/.

Moreover, studies have shown that, in California, communities near dairies are disproportionately Latino/a/e.[21]

To avoid the perpetuation of harm in disadvantaged communities, the Treasury Department and IRS must remove biogas from the proposed regulation, and instead limit these incentives to truly renewable hydrogen, in line with the principles contained in the "Environmental Justice Position on Green Hydrogen in California."[22]

II. Questions From Treasury Department And IRS

Question 1: What data sources and peer reviewed studies provide information on RNG production systems (including biogas production and reforming systems), markets, monitoring, reporting, and verification processes, and GHG emissions associated with these production systems and markets?

The following data sources and peer reviewed studies provide information on RNG production: (a) Waste Stream to Revenue Stream: Calculating the Costs and Climate Impact of California's Investments in Dairy Digester Infrastructure;[23] (b) Greenhouse Gas and Ammonia Emissions from Digested and Separated Dairy Manure During Storage and After Land Application;[24] (c) Methane Emissions Along Biomethane and Biogas Supply Chains are Underestimated;[25] (d) Ammonia and Methane Emissions From Dairy Concentrated Animal Feeding Operations in California, Using Mobile Optical Remote Sensing;[26] (e) Methane Emissions from Digestate at an Agricultural Biogas Plant;[27] (F) Greenhouse Gas Emissions from Storage and Field Application of Anaerobically Digested and Non-Digested Cattle Slurry;[28] and (G) Climate Justice and

[21] Casey et al., *supra* note 19; Blake, *supra* note 19.
[22] https://www.cbecal.org/wp-content/uploads/2023/10/Equity-Hydrogen-Initiative-Shared-Hydrogen-Position-1.pdf
[23] Donovan Wakeman & Kevin Fingerman, Ph.D. https://www.centerforfoodsafety.org/files/waste-stream-to-revenue-stream_final_35719.pdf
[24] Michael A. Holly et al., *Greenhouse Gas and Ammonia Emissions from Digested and Separated Dairy Manure During Storage and After Land Application*, 239 AGRIC, ECOSYSTEMS & ENV'T 410, 411 (Feb. 2017), https://www.sciencedirect.com/science/article/pii/S0167880917300701.
[25] https://www.cell.com/one-earth/pdf/S2590-3322(22)00267-6.pdf
[26] N.T. Vechi et al., *Ammonia and Methane Emissions from Dairy Concentrated Animal Feeding Operations in California, Using Mobile Optical Remote Sensing*, 293 ATMOSPHERIC ENV'T 119448 (2023), https://www.sciencedirect.com/science/article/pii/S1352231022005131.
[27] Hambaliou Baldé et al., *Methane Emissions from Digestate at An Agricultural Biogas Plant*, 216 BIORESOURCES TECH. 914 (Sept. 2016), https://perma.cc/BVQ9-XKN2.
[28] Lena K.K. Rodhe et al., *Greenhouse Gas Emissions from Storage and Field Application of Anaerobically Digested and Non-Digested Cattle Slurry*, 199 AG., ECOSYSTEMS & ENV'T 358 (Jan. 2015), https://perma.cc/LE8U-W87U; Hambaliou Baldé et al., *Methane Emissions from Digestate at An Agricultural Biogas Plant*, 216 BIORESOURCES TECH. 914 (Sept. 2016), https://perma.cc/BVQ9-XKN2.

California's Methane Superemitters: Environmental Equity Assessment of Community Proximity and Exposure Intensity.[29]

> **Question 2: What conditions for the use of biogas and RNG would ensure that emissions accounting for purposes of the section 45V credit reflects and reduces the risk of indirect emissions effects from hydrogen production using biogas and RNG? How can taxpayers verify that they have met these requirements?**

We are skeptical that any implementable conditions could reduce the risk of emissions or of groundwater and air quality pollution associated with hydrogen production using dairy biogas. The Treasury Department and IRS could require ongoing on-site and fenceline monitoring to verify that the dairy is not causing or contributing to air or water pollution or water overuse. However, we question whether this is implementable on a national scale. To the extent that the Treasure Department and IRS pursue this approach, they must ensure consideration of hydrogen's full production lifecycle, including the production of manure.

> **Question 5: What are the emissions associated with different methods of transporting RNG or fugitive methane to hydrogen producers (for example, vehicular transport, pipeline)?**

Vehicular transport of biogas and/or manure is a significant concern. As noted above, concentrated dairy herds cause significant air pollution and are often located in polluted air basins. For example, in California's San Joaquin Valley is home to hundreds of large-scale dairy operations and is in serious nonattainment with federal air quality standards for both PM2.5 and ozone.[30] Bakersfield is the most polluted city in the country with respect to short-term exposure to PM2.5, followed by Fresno-Madera-Hanford, with Visalia coming in fourth.[31] Bakersfield and Visalia are tied for the most polluted cities with respect to long term PM2.5 exposure, followed immediately by Visalia.[32] The California Air Resources Board has acknowledged that PM2.5 exposure alone "is responsible for about 1,200 cases of premature death in the San Joaquin Valley each year."[33] Additional trucking emissions associated with transportation of biogas

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[29] Casey et al., *supra* note 19.

[30] Designation of Areas for Air Quality Planning Purposes; California; San Joaquin Valley; Reclassification as Serious Nonattainment for the 1997 PM2.5 Standards, 80 FED. REG. 18528 (Apr. 7, 2015); Designation of Areas for Air Quality Planning Purposes; California; San Joaquin Valley; Reclassification as Serious Nonattainment for the 2006 PM2.5 NAAQS, 81 FED. REG. 2993 (Jan. 20, 2016); Air Quality Designations for the 2012 Primary Annual Fine Particle (PM[2.5]) National Ambient Air Quality Standards (NAAQS), 80 FED. REG. 2206, 2217 (Jan. 15, 2015).

[31] AM. LUNG ASSN., STATE OF THE AIR 14 (2023), https://perma.cc/4TDN-LKH3.

[32] *Id.* at 16

[33] Press Release, *Clean-Air Plan for San Joaquin Valley First to Meet All Federal Standards for Fine Particle Pollution*, CARB (Jan. 24, 2019), https://perma.cc/7YR7-E3C6.

would worsen air quality and health outcomes in communities in the San Joaquin Valley and other regions.

Questions 7 and 8:

How can the potential for the generation of additional emissions from the production of additional waste, waste diversion from lower-emitting disposal methods, and changes in waste management practices be limited through emissions accounting or rules for biogas and RNG use established for purposes of the section 45V credit?

To limit the additional production of waste, should the final regulations limit eligibility to methane sources that existed as of a certain date or waste or waste streams that were produced before a certain date, such as the date that the IRA was enacted? If so, how can that be documented or verified? How should any changes in volumes of waste and waste capacity at existing methane sources be documented and treated for purposes of the section 45V credit? How should additional capture of existing waste or waste streams be documented and treated?

The only truly effective way to avoid the potential for generation of additional emissions from the production of additional livestock waste (manure) is to revise the proposed regulation to exclude hydrogen produced using livestock biogas. This is because the inclusion of biogas in the proposed regulation encourages dairies and other livestock operations to expand and structure their operations in ways that maximize methane pollution.[34] These counterproductive dynamics are explainable, in part, by the "cobra effect," whereby people are incentivized to produce more of the thing that a program is intended to mitigate.[35] Turning avoidable pollution into a valuable product influences rational economic actors to follow this manner of thinking in their operational decision making. Instead of mitigating the manure methane problem, it has transformed it into a lucrative product that dairies now seek to maximize for subsequent "capture." These intentionally produced methane emissions are inherently climate intensive.[36]

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[34] Dairies have multiple options for manure management. Many dairies use free stalls or corrals with a flush system. Other options, used by some dairies, include pasture-based manure management and dry manure management using scraping or vacuuming. The latter two are manure management techniques available to dairies which use less water and produce fewer pollutants overall.

[35] The "cobra effect" refers to a specific anecdote that illustrates how policies can have perverse, unintended consequences. In India, the British Colonial Government implemented a bounty system for bringing dead cobra snakes to administration official to reduce cobra populations in Delhi. At first, the policy appeared successful, but over time the number of dead cobras brought in for bounty continued to increase. Instead of working to capture wild cobras, clever snake catchers simply started breeding cobras to then kill for the bounty. This dynamic has been observed in many contexts. *See* Barry Newell & Christopher Doll, *Systems Thinking and the Cobra Effect*, UNITED NATIONS U. (Sept. 16, 2015), https://perma.cc/2P9A-2H9E.

[36] Emily Grubert, *At Scale, Renewable Natural Gas Systems Could be Climate Intensive: The Influence of Methane Feedstock and Leakage Rates*, 15 ENV'T RESEARCH LETTERS (2020), https://doi.org/10.1088/1748-9326%2Fab9335.

In the event that biogas is not fully excluded, the Treasury Department and IRS must, at a minimum, (1) apply an accurate baseline, or counterfactual, to biogas production as discussed in our answer to Question 11 below, and (2) ensure that the final regulations limit eligibility to the volume of available feedstock (manure managed in a way that produces methane) that existed at a participating livestock operation as of the date the IRA was enacted. We further recommend that the regulations exclude livestock operations that have expanded since enactment of the IRA in an effort to maximize tax credit potential pursuant to this program.

Question 11: What counterfactual assumptions and data should be used to assess the lifecycle GHG emissions of hydrogen production pathways that rely on RNG? Is venting an appropriate counterfactual assumption for some pathways? If not, what other factors should be considered?

Venting is not an appropriate counterfactual. There should not be the assumption that livestock manure methane is able to freely vent into the atmosphere. Livestock methane emissions are not inevitable or unavoidable if proper manure management practices are utilized and appropriate regulations are adopted and enforced. The counterfactual assumption should instead be that livestock herds are managed to prioritize preventing the production of methane rather than increasing the methane available for capture. Another, similar counterfactual is that biogas from manure is captured and destroyed through flaring. Any program that monetizes manure and methane production encourages associated herd and manure management practices that will create more methane and more pollution impacting nearby communities and the environment as a whole. These harmful practices include herd concentration, herd expansion, and liquid manure management.

* * * * *

We ask for your careful consideration of these comments, and for revisions that will avoid incentivizing practices that harm low-income communities of color.

Sincerely,

Nicola Steelnack
Leadership Counsel for Justice and Accountability

Melissa Romero
California Environmental Voters

Dashel Murawski

Kevin Hamilton
Central California Asthma Collaborative

Daniel Chandler
350 Humboldt Steering Committee

Suzanne Hume

Center for Food Safety

Clean Earth4Kids

Catherine Garoupe White
Central Valley Air Quality Coalition

Antonio Diaz
People Organizing to Demand Environmental & Economic Rights (PODER)

Amelia Keyes
Communities for a Better Environment

Tyler Lobdell
Food and Water Watch

Faraz Rizvi
Asian Pacific Environmental Network