

November 8, 2024

Via Electronic Submittal

Clerk of the Board
California Air Resources Board
1001 I. Street
Sacramento, CA 95814

Re: Comments on the Final Environmental Impact Analysis and
Responses to Comments on the Proposed Amendments to the Low
Carbon Fuel Standard

Dear Honorable Members of the California Air Resources Board:

The firm represents Leadership Counsel for Justice and Accountability (“Leadership Counsel”) in matters relating to the California Air Resources Board’s (“CARB”) Proposed Amendments to the Low Carbon Fuel Standard Regulation (“Proposed Amendments” or “Project”).¹ Central Valley Defenders of Clean Water & Air, Animal Legal Defense Fund (“ALDF”), and Food & Water Watch (“FWW”) have informed us that they also join in this letter. We previously submitted multiple sets of comments explaining that the Proposed Amendments greatly increase the incentive that large dairies with liquid manure handling systems (“factory farms”) have to expand their herd sizes and install anaerobic digesters. Both the Draft Environmental Impact Analysis (“DEIA”) and the Recirculated Draft Environmental Impact Analysis (“Recirculated DEIA”) omitted *any* analysis of the environmental impacts of herd expansion and included an insufficient, cursory analysis of the impacts associated with digesters.

¹ CARB acts pursuant to a certified regulatory program which exempts the agency from preparing an Environmental Impact Report (“EIR”) because the environmental analysis CARB is required to undertake is deemed the functional equivalent of an EIR. 17 Cal. Code. Regs. §§ 60000-60007; *POET, LLC v. State Air Resources Bd.* (2013) 218 Cal.App.4th 681, 710 CARB’s actions are subject to all other applicable provisions of CEQA. 14 Cal. Code Regs. § 15250; *POET, LLC*, 218 Cal.App.4th at 710.

In its Final Environmental Impact Analysis (“FEIA”) and Responses to Comments, CARB continues to not take seriously the severe environmental impacts that the Proposed Amendments will cause. CARB doubles-down on its unsupported and contradictory position that herd expansion is not a reasonably foreseeable compliance response to the Proposed Amendments. CARB also fails to seriously contend with the study submitted by Leadership Counsel that attacks the EIA’s cursory analysis of the impacts associated with anaerobic digesters. CARB once again ignores the CEQA Guideline providing explicitly that lead agencies must adopt all feasible mitigation measures even when adopting a regulatory change, which include measures incorporated into the regulation itself. Additionally, CARB fails to provide any justification to support its decision not to analyze an alternative scenario that eliminates LCFS crediting for fuel pathways derived from manure methane emissions and achieves the State’s methane reduction goals through direct regulation. Lastly, CARB ignores its obligation to recirculate the DEIA to account for the significant changes in the Second 15-Day Notice. Approval of the Proposed Amendments, despite these numerous flaws, would be a clear violation of CEQA.

I. The Proposed Amendments increase the already large incentive for factory farms to expand their herds and install anaerobic digesters.

In comments on the DEIA, RDEIA, and 15-day Notices, Leadership Counsel explained that the Proposed Amendments provide a clear signal to factory farms to expand their herds and install digesters in the near-term, to take advantage of the lucrative financial benefits provided by the LCFS. For example, the Proposed Amendments would strengthen the LCFS’ carbon intensity benchmark², thereby increasing demand for LCFS credits and the money eligible fuel producers, including factory farms, receive for LCFS credits. CARB also proposes to draw a bright line between biomethane fuel pathways certified before, and after, the effective date of the regulation³, providing significantly more benefits to pathways certified in the next few years. Additionally, the Proposed Amendments provide that the rule limiting avoided

² CARB, Notice of Public Availability of Modified Text and Availability of Additional Documents and/or Information, at 5 (August 12, 2024) (“First Additional Modifications”).

³ CARB, Second Notice of Public Availability of Modified Text and Availability of Additional Documents and/or Information, at 8 (subsection 95488.9(f)(3)(A)) (October 1, 2024) (“Second Additional Modifications”).

methane crediting if there is a law, regulation, or mandate requiring methane reductions only applies to pathways that break ground after December 31, 2029.”⁴

CARB attempts to downplay the effect of the Proposed Amendments, referring to “several changes to biomethane crediting under the LCFS program in the Proposed Amendments which, when compared to the existing regulation, reduce the long-term incentive provided for biomethane combustion in the LCFS.”⁵ In support, they cite the numerous proposed modifications that restrict LCFS crediting eligibility after either the effective date of the regulation or December 31, 2029.⁶ However, CARB fails to recognize that this temporal restriction provides a strong signal to factory farms to expand their herds and install anaerobic digesters in the near-term, so that they may take advantage of the LCFS’ lucrative benefits before they begin dwindling.

II. CARB fails to justify its refusal to acknowledge that herd expansion is a reasonably foreseeable compliance response to the Proposed Amendments.

CARB has failed to comply with its obligation to analyze all reasonably foreseeable environmental impacts caused by a project they are proposing to approve. *Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal.3d 376, 396-98; *Ebbetts Pass Forest Watch v. Cal. Dept. of Forestry & Fire Protection* (2008) 43 Cal.4th 936, 954-55. CARB has taken the position that herd expansion in response to the Proposed Amendments is too “speculative” to be subject to environmental review. However, CARB fails to support its position with substantial evidence, as CEQA requires. *Santa Rita Union School Dist. v. City of Salinas* (2023) 94 Cal.App.5th 298, 334-36. Leadership Counsel provided voluminous data demonstrating that expansion of herds is a reasonably foreseeable compliance response to the Proposed Amendments, no different than the installation of anaerobic digesters, increased production of fuel derived from factory farm manure, or the myriad other reasonably foreseeable compliance responses CARB acknowledges.

In the Recirculated DEIA—the first instance in which CARB acknowledged the potential of herd expansion—CARB chiefly relied on data and analyses derived from the California Dairy & Livestock Database (“CADD”) to support its position that the LCFS has no effect on the expansion of herds at factory farms, and that there is no statistically significant relationship between anaerobic digesters and herd expansion. Leadership Counsel submitted comments on the Recirculated DEIA explaining the myriad flaws in

⁴ *Id.* at 8-9 (subsection 95488.9(f)(3)(B)).

⁵ Responses to Comments, at 10.

⁶ Responses to Comments, at 10.

the CADD. On October 22, 2024, Leadership Counsel submitted comments on the CADD, which is still currently in draft form as CARB considers public comments.⁷ These comments explain in great detail the numerous defects in the CADD, including: (1) that CADD was developed using unreliable data; (2) staff used inappropriate methodologies to analyze data in the CADD; and (3) staff refused to conduct an appropriate data analysis to avoid the conclusion that there is a statistically significant relationship between digesters and herd expansion.

In its Response to Comments, CARB fails to address the numerous problems with CADD. CARB admits that there are discrepancies in the CADD data when compared to other sources.⁸ CARB nonetheless justifies relying on this data on the grounds that the CADD data sources are more comprehensive than any other source—a claim for which they provide no support. However, even if the data sources CADD relies on are *relatively* more comprehensive than other data sources, which they may not be, CARB has not demonstrated the CADD data are sufficiently accurate to support CARB’s sweeping conclusion that the LCFS has no causal effect on herd expansion, particularly in light of the evidence presented by Leadership Counsel that shows the exact opposite.

Leadership Counsel also pointed out that CARB omitted a significant volume of dairies from its analysis: those that ceased to exist between 2017 and 2022. CARB asserts that “[f]acilities that shut down are not germane to concerns around expansion” and “[o]nly operational dairies (as of 2022) were considered because including dairies that shut down would mask the true growth rates of facilities that remained operational.”⁹ CARB again provides no support for its claim. Nor could it. A majority of the dairies that ceased operations between 2017 and 2022 had no digester. Data on the dairies without digesters that reduced their animal populations to zero after LCFS crediting begin are obviously “germane to concerns around expansion,” as are data on the dairies without digesters that increased their animal populations after crediting began. If these dairies were included in CARB’s analysis, CARB would have been forced to acknowledge the statistically significant relationship between anaerobic digesters and herd expansion. CARB also fails to justify its omission of dairies with “under-construction” digesters from its analysis, simply asserting that this omission was necessary because “some

⁷ Leadership Counsel et al., Comments on CARB Staff’s August 22, 2024 Dairy Sector Workshop Presentations, the California Dairy and Livestock Database, and Staff’s Use of the CADD (October 22, 2024) (**Exhibit A**). Attached separately as **Exhibit B** is a excel spreadsheet that was attached as Exhibit 2 to Leadership Counsel’s comments.

⁸ Responses to Comments, at 269.

⁹ Responses to Comments, at 270.

facilities that were initially selected to receive a digester grant ... did not complete the digester installation.”¹⁰

Due to these flaws,¹¹ the data and analysis derived from CADD cannot constitute “substantial evidence” supporting CARB’s conclusion that herd expansion is too speculative to analyze. *Holden v. City of San Diego* (2019) 43 Cal.App.5th 404, 410 (“Substantial evidence is evidence of ponderable legal significance that is reasonable in nature, credible, and of solid value”). CARB has not complied with its obligation to conduct a “thorough investigation” and “note its conclusion” that herd expansion is too speculative to be the subject of CEQA review. 14 Cal. Code Regs. § 15145; *County of Butte v. Dept. of Water Resources* (2023) 90 Cal.App.5th 147, 161. Approval of the Proposed Amendments without first analyzing the severe environmental impacts associated with herd expansion, particularly in pollution-burdened communities like the Central Valley, would be a clear violation of CEQA.

III. The DEIA did not analyze the out-of-state impacts caused by anaerobic digesters and herd expansion.

The significant air quality, water quality, public health, and greenhouse gas impacts caused by the Proposed Amendments are not limited to California. More evidence substantiating the link between the LCFS and nationwide anaerobic digester installation has surfaced since Leadership Counsel commented on the Recirculated DEIA. On November 3, 2024, *The Gazette* published an article analyzing the link between the LCFS and anaerobic digester installations in Iowa.¹² The article notes a significant increase in animal units on factory farms after they received a permit to install an anaerobic digester. Digesters in Iowa have caused significant environmental impacts, including almost 400,000 gallons of liquefied manure leaking from a digester into a

¹⁰ Responses to Comments, at 270.

¹¹ CARB also asserts for the first time that the LCFS has no causal effect on herd expansion because a factory farm must have an open lagoon to qualify for credits, and only large farms typically use open lagoons. (Responses to Comments, at 8). CARB points out precisely why the LCFS incentivizes herd expansion. Only large factory farms are eligible for LCFS avoided methane credits and the larger the farm, the more credits generated, providing a significant incentive for farms to expand their herds.

¹² Jordan, Erin, “‘More Manure Means More Energy’: Iowa Dairies with Biogas Digesters are Growing their Herds, which Concerns Water Quality Advocates,” *The Gazette*, (Nov. 3, 2024) (**Exhibit C**).

creek, which the Iowa Department of Natural Resources found “resulted in the degradation of water quality and caus[ed] an elevated pollutant level.”

The article also makes the culprit for this increase clear:

California is driving the development of anaerobic digesters across the farm belt. California requires fuel producers there to stay below certain carbon intensity thresholds or buy credits from low-carbon fuel producers in California or other states. If a digester facility in Iowa can supply Renewable Natural Gas to a pipeline that goes to California, the digester facility can sell its credits to California companies.

Because factory farms nationwide are eligible for LCFS crediting, the Proposed Amendments provide the same incentives to out-of-state and in-state factory farms. CEQA therefore requires that CARB analyze the out-of-state impacts of herd expansion and anaerobic digesters with the same rigor as it analyzed in-state impacts. CEQA requires lead agencies to analyze potentially significant impacts of proposed projects that may occur in “the area which will be affected by [the] proposed project.” 14 Cal. Code Regs. § 15360. There is no limitation in the statute authorizing lead agencies to avoid analyzing the impacts of a project simply because those impacts are felt out-of-state. CARB’s assertion that “CEQA does not specifically require lead agencies to analyze out-of-state impacts” is a blatant misstatement of law.

CARB’s assertion that “out-of-state impacts were an integral part of” its analysis lacks any support. CARB attempts to pass off its California-specific air quality, water quality, public health, and greenhouse gas analysis as generally applicable to the entire nation, stating: “For example, out-of-state dairy facilities already participate in the LCFS program, as disclosed in the ISOR, so the reasonably foreseeable impacts discussed in the EIA related to dairy facilities would generally apply to out-of-state as well as in-state facilities.”¹³ However, the EIA’s air quality impact analysis, for example, refers specifically to impacts in California, and relies on the Standardized Regulatory impact Assessment that, in turn, focused on California impacts.¹⁴ The EIA also analyzed the air quality impacts of the Proposed Amendments on each air basin *within California*.¹⁵ This analysis is not generally applicable nationwide. CARB cannot retroactively assert that its California-specific analysis is generally applicable nationwide to avoid CEQA’s clear

¹³ Responses to Comments, at 15.

¹⁴ FEIA, at 62-64.

¹⁵ FEIA, at 65-70.

dictate to analyze all of the Proposed Amendments' impacts. 14 Cal. Code Regs. § 15360.

IV. CARB fails to justify its cursory analysis of the environmental impacts associated with anaerobic digesters.

Leadership Counsel submitted comments, supported by a report from an environmental chemist, delineating the significant air quality, water quality, and greenhouse gas emissions caused by anaerobic digesters, which the FEIA undercounts. CARB appears to acknowledge that nitrous oxide emissions are worse from digestate than raw manure, but completely ignores the study provided by Leadership Counsel. Instead, CARB takes the confounding position that installation of anaerobic digesters at factory farms with open lagoons “does not mean that more digestate is produced.”¹⁶ Unsurprisingly, CARB does not provide a single citation to support its position, which is glaringly inconsistent with its omission in the FEIA that the Proposed Amendments will cause significant impacts because they incentivize the installation of anaerobic digesters.

V. CARB's approach to mitigation is legally erroneous and not based in reality.

Leadership Counsel advocated for the adoption of numerous feasible mitigation measures that would reduce the significant air quality, water quality, and greenhouse gas impacts caused by the Proposed Amendments. In response, CARB doubles down on its legally erroneous approach to mitigation, asserting that Leadership Counsel's proposed mitigation “may be more appropriately viewed as suggested project alternatives, since they would change the design of the program rather than operate as additional measures for reducing impacts or as conditions of approval.”¹⁷ CARB ignores the CEQA Guideline section that provides: “In the case of the adoption of a plan, policy, regulation, or other public project, *mitigation measures can be incorporated into the plan, policy, regulation, or project design.*” 14 Cal. Code Regs. § 15126.4(a)(2) (emphasis added). CARB continues to confuse the Project before it (the Proposed Amendments) with the individual projects (e.g., anaerobic digesters) that are incentivized by the Proposed Amendments. CARB has the authority—and the obligation—to incorporate mitigation measures into the Proposed Amendments.

Each of the mitigation measures Leadership Counsel advocates for its feasible. CARB claims that mitigation measures which would reduce the financial benefits for installing anaerobic digesters are infeasible because they contradict the 2022 Scoping

¹⁶ Responses to Comments, at 11.

¹⁷ Responses to Comments, at 161.

Plan, which relies on methane capture to achieve the State's methane reduction goals.¹⁸ CARB's position relies on a false premise—that factory farms will only reduce their methane emissions if they are incentivized to do by the LCFS. However, in Senate Bill 1383 the State Legislature mandated that CARB develop and implement direct regulation of the dairy and livestock industry. CARB itself acknowledged in its 2022 Scoping Plan that direct regulation of the sources of methane emissions is integral to the State's methane emissions reduction strategy.¹⁹ CARB's stated strategy for reducing the emissions of short-lived climate pollutants, most notably methane, is a “carrot-then-stick” approach.²⁰ This approach begins with the incentive-based, indirect regulations, such as the LCFS (the “carrot”), and then transitions into direct regulation, similar to those that have been promulgated for the landfill and oil and gas systems (the “stick”). The 2022 Scoping Plan ultimately recommends the carrot and stick approach for manure methane.²¹ It is feasible to limit LCFS crediting for environmentally damaging dairies and factory farms without sacrificing the State's methane reduction goals. CEQA requires CARB to do so.

VI. CARB must analyze an alternative scenario that achieves the State's methane reduction goals without causing the severe environmental impacts associated with factory farm herd expansion and anaerobic digester usage.

CARB failed to provide any explanation for its failure to consider an alternative scenario that eliminates LCFS credits for fuel derived from manure emissions and achieves methane emission reductions through direct regulation. CARB simply asserts that “the Draft EIA presents a reasonable range of alternatives, evaluates their potential to achieve most of the basic project objectives, and evaluates whether the respective alternative would avoid or reduce the potentially significant environmental impacts of the Proposed Amendments in compliance with CEQA requirements.”²² CARB's failure to even attempt to justify its omission of this alternative scenario is a clear violation of CEQA. *See Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 564 (referring to the discussion of mitigation and alternatives as “the core” of CEQA analysis).

¹⁸ Responses to Comments, at

¹⁹ California Air Resources Board, 2022 Scoping Plan, at 222-25 (2022), available at <https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf>.

²⁰ *Id.* at 223.

²¹ *Id.* at 232.

²² Responses to Comments, at 30-31.

VII. The DEIA must be recirculated to account for the significant proposed change in the Second 15-Day Notice.

After CARB issued the Recirculated DEIA, CARB issued the Second 15-Day Notice, which made a monumental change to the Proposed Amendments. The Proposed Amendments now provide that the proposed amendment limiting avoided methane crediting if there is a law, regulation, or mandate requiring methane reductions only applies to pathways that break ground after December 31, 2029.²³ The additional years of credit generation awarded by this last-minute amendment will greatly increase the incentive dairies and factory farms have to expand herds and install digesters, thereby increasing the severity of the significant and unavoidable air quality, water quality, greenhouse gas, and public health impacts that CARB acknowledges, and those that it does not. CARB asserts that the changes in the Second 15-Day Notice “merely clarify, amplify, or make insignificant the modifications in the EIR, so recirculation of the EIA was not necessary.”²⁴ CARB provides no support for this assertion. CEQA requires CARB to recirculate the DEIA and update the analysis to account for the changes in the Second 15-Day Notice. *See* Pub. Res. Code § 21092.1; 14 Cal. Code Regs. § 15088.5; *Laurel Heights Improvement Ass’n v. Regents of Univ. of Cal.* (1993) 6 Cal.4th 1112, 1130; *Western Placer Citizens for an Agricultural & Rural Environment v. County of Placer* (2006) 144 Cal.App.4th 890, 899-903.

Very truly yours,

SHUTE, MIHALY & WEINBERGER LLP



Orran G. Balagopalan, Attorney

²³ Second Additional Modifications, at 8-9 (subsection 95488.9(f)(3)(B)).

²⁴ Responses to Comments, at 499.

EXHIBIT A

October 22, 2024

Submitted via ca.gov

Liane M. Randolph, Chair
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: Comments on CARB Staff's August 22, 2024, Dairy Sector Workshop Presentations, the California Dairy and Livestock Database, and Staff's Use of the CADD

Dear Chair Randolph:

Leadership Counsel for Justice & Accountability, Central Valley Defenders of Clean Water & Air, Animal Legal Defense Fund, and Food & Water Watch (collectively, "Commenters") submit these comments on the California Air Resources Board ("CARB") Staff's August 22, 2024, Dairy Sector Workshop and California Dairy and Livestock Database ("CADD"). The staff presentation did not accurately present CARB's legal obligations or the limits of CARB's authority. Further, the CADD suffers from numerous analytical and data integrity flaws, and CARB Staff's use of the CADD is methodologically corrupt. Accordingly, Staff's assessment is, at best, unsupported and unreliable.

We urge CARB to reject the CADD as presented and disregard Staff's flawed analysis of what the CADD tells us about California dairy herds. We further reiterate our request that CARB disregard the CADD in the Low Carbon Fuel Standard (LCFS) rulemaking and associated environmental analyses. The CADD and Staff's presentation during the workshop are factually and legally flawed and therefore cannot set the foundation for a SB 1383 rulemaking to directly regulate manure methane emissions, which CARB has a legal mandate to initiate immediately.

Summary of Comments

- CARB Staff's Dairy Sector Workshop presentations contained factual and legal errors regarding CARB's legal obligations, including the requirements of SB 1383 and the limits of CARB's legal authority.
- CARB Staff use the CADD to conclude that lucrative incentives for dairy digesters have not perversely spurred herd expansions. That conclusion, though, is flawed for two reasons: (1) the CADD includes unreliable data, and (2) CARB Staff used inappropriate methodologies to analyze the data.
- Commenters' analysis using the appropriate methodology reveals that California dairies with digesters *are* expanding at a greater rate than those without and that there is evidence that lucrative avoided methane crediting under the LCFS is *causing* herd expansions.

Comments

A. CARB Staff's Dairy Sector Workshop Presentations

On August 22, 2024, CARB Staff conducted presentations during the Dairy Sector Workshop. These presentations contained factual and legal errors with respect to CARB's legal obligations, including the requirements of SB 1383 or the limits of CARB's authority.

First: CARB cannot legally and factually count purported methane reductions from statewide dairy herd changes, which CARB claims account for a significant portion of methane reductions now and by 2030.¹ Senate Bill 1383 requires that CARB adopt regulations to reduce methane emissions from manure management.² Methane reductions from voluntary herd size changes lack the regulatory mandate the Legislature imposed, and thus the stability that regulations provide. Nothing would prevent backsliding either before or after 2030, the date by which CARB must secure the reductions, which is particularly concerning when CARB is trying to send long-term signals under other programs like the LCFS that incentivize larger herds for decades to come. Further, CARB's own CADD data analysis indicates that dairies in operation since 2017 have an historical positive growth trend, contradicting CARB's projections of further methane reductions in the future. Slide 46 of the Dairy Sector Workshop Presentation discloses that CADD data show that dairies with digesters had an average growth rate of 1.3 percent and non-digester dairies had an average growth rate of 0.6 percent. These data show that CARB's future projection of continued decreases in the California dairy herd lack any factual basis. CARB Staff should instead project methane increases given the historical trend of dairies still in operation. Absent a regulatory mandate to limit herd sizes, CARB's reliance on herd size changes to achieve the SB 1383 target are both unlawful and arbitrary and capricious.

Second: CARB cannot double count manure methane capture toward SB 1383's 40 percent target while simultaneously allowing avoided methane crediting under the LCFS to function as an offset mechanism for the transportation sector. As CARB staff have acknowledged, the same captured emissions cannot be used to satisfy separate obligations in separate sectors.³ Therefore, CARB's assessment of progress toward SB 1383 compliance significantly overestimates progress in the dairy sector and is arbitrary and capricious.

Third: CARB Staff conflate the pre-adoption required actions with the pre-implementation required actions when CARB Staff contend that it has not performed all actions required to promulgate the SB 1383 regulations. To the contrary, SB 1383 carefully bifurcates certain steps CARB must take before adopting regulations and before implementing those regulations. As California Dairy Sector Workshop Slide 8 demonstrates, CARB has completed all conditions precedent to adopting regulations listed in Health & Safety Code §

¹ CARB relies on the CADD data to project approximately 2.6 MMTCO₂e of methane reductions between 2022 and 2030, while projecting approximately 1.6 MMTCO₂e using its current inventory methodology. See Staff Presentation at Slide 53.

² Health & Safety Code § 39730.7(b)(1).

³ CARB, Response to Petition for Rulemaking to Regulate Methane and Other Air Pollutants from California Livestock at n.34 (May 30, 2024), <https://ww2.arb.ca.gov/sites/default/files/2024-05/2024-05-30-CARB-CDFA-Response-to-Dairy-Rulemaking-Petition.pdf>.

39730.7(b)(2). CARB shall adopt the regulations and has no basis to continue delaying adoption.

B. Staff's Faulty Assessment that Dairy Digesters and Related Subsidies Do Not Impact Herd Sizes Is Based on Unreliable Data and Inappropriate Methodologies

Staff's development and use of the CADD to indicate that lucrative incentives for digesters on dairies have not perversely spurred herd expansions is fatally flawed for several reasons and therefore CARB cannot rely on it. First, Staff populated the CADD with unreliable data. Second, Staff relied on both unclear and inappropriate methodologies to analyze the data. As explained below, using more effective and appropriate methodologies consistently provide evidence that lucrative avoided methane crediting under the LCFS is causing herd expansions. Staff have questionably opted to deploy outcome determinative analytical techniques that conveniently shift the answer of whether CARB's policies are having perverse effects on dairy herd management from "yes" to "no."

1. The CADD was developed using unreliable data.

The CADD was developed by CARB staff with data from a variety of sources, none of which are managed by CARB. Staff primarily pulled from reporting data collected by Regional Water Quality Control Boards and used other sources when data was missing from Regional Water Board reporting data. Unfortunately, the CADD does not indicate what data sources are used for which dairies in each year, making it difficult to assess the quality of the data and CARB's methodology for filling data gaps. We are still awaiting release of a "Technical Document"⁴ that we hope will assist the general public in understanding CARB's methodology. It appears that if a dairy is missing annual report data in the Water Quality Control Board dataset, CARB relied on reporting data from neighboring years. If there are no such substitute data, CARB looked to other data sources including air district permits that do not reflect nor do they require reporting of actual herd size at a given time because instead they set a static permitted herd size. Significant data gaps, paired with reliance on assumptions and a variety of data sources to complete the CADD results in data with dubious accuracy. For example, according to CADD data, over 400 livestock operations with dairy cows show the identical number of both milk cows and dry cows for at least three consecutive years during the 2017-2022 time period. Given that perfect uniformity in a dairy's herd year to year is very unlikely, paired with Staff's failure to disclose what values are gap fillers, we can only assume many of these are assumed data. CARB cannot assess herd size trends under these conditions.

And there are discrepancies in the data when compared to other data sources. For instance, several dairies in Tulare County reported different data as part of the county's reporting program than what appears in the CADD.⁵ Hettinga Farms reports 5,942 cows in the CADD data for 2022, but 6,671 cows per Tulare county data in 2022. Avenue 128 Dairy reports 3,519 cows according to CADD data, and 4,252 cows per Tulare County data for the same year. JR Dairy had 5,570 according to the CADD, but 5,714 according to Tulare County data for 2022 .

⁴ CARB, *CADD 1.00 ReadMe* (Aug. 16, 2024), https://ww2.arb.ca.gov/sites/default/files/2024-08/CADD_Readme_v1.0.0_2024-08-16.pdf.

⁵ Tulare County ACFP list - 2022 ACR Numbers (included as Exhibit 1).

Similarly, several Tulare County dairies show vastly different populations in the CADD data for 2022 compared to populations reported on their LCFS Tier 2 applications.⁶ Again, Hettinga Farms, which reports 5,942 cows in the CADD data, reports 6,900 on Tier 2 Pathway Application No. B0543, deemed complete in 2023. Avenue 128 Dairy in Tipton reports 3,519 cows in 2022 according to CADD, and 5,300 according to Application No. B0543. JR Dairy, with 5,570 cows according to CADD, reports 6,300 on Application No. B0543.

As these discrepancies illustrate, it is inappropriate to derive conclusions about trends in the dairy industry from data rife with data gaps and questionable assumptions. Staff's failure to disclose the extent of those gaps and assumptions raises additional concerns about the integrity of staff's analysis and presentation during the Workshop. It bears noting that the discrepancies we have thus far identified indicate that the CADD may systematically undercount livestock populations for an unknown number of dairies.

2. Staff used inappropriate methodologies to analyze data from the CADD

In addition to questionable underlying data collection, CARB staff are using inappropriate methodologies to analyze the CADD, possibly relying on statistical methods that yield hoped-for results instead of those best suited to the question at hand. Below we outline the various methodological problems with Staff's use of the CADD.

a. CARB assesses for a trend on a year-to-year basis instead of a more appropriate time period

Staff evaluate the growth of dairies on an annual basis for the post 2017 period. This analysis takes each year in a vacuum rather than testing the impact of CARB's digester policies over the long term, adding statistical uncertainty and obscuring longer term trends. More appropriate approaches to assessing the impact of a 2017 policy change include comparing herd sizes in 2022 against herd sizes in 2017 and assessing the post 2017 period against the pre-2017 period as we have done in our analysis described below.

b. CARB inappropriately excludes dairy closures and openings that occurred between 2017 and 2022

Some of Staff's categorization assumptions apparently exclude dairy closures and openings from CARB's data. As noted in Dairy Sector Workshop Presentation Slide 46 "Assign dairies that have been operational since 2017" indicates that CARB's analysis only includes dairies that were operational in all years since 2017.

CARB's exclusion of dairies that closed between 2017 and 2022, in fact, is the only way that it can arrive at the conclusions presented at the Dairy Sector Workshop that the overall herd is declining (Slide 42) yet both dairies with digesters and dairies without digesters grew between 2017 and 2022 (Slide 47). That can only be possible if CARB removed a class of dairies

⁶ CARB, LCFS Pathway Application, Application No. B0543 (updated Sept. 27, 2024), https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/fuelpathways/comments/tier2/b0543_summary.pdf.

– *i.e.*, those dairies that ceased to exist between 2017 and 2022 – from the analysis. The vast majority of dairies that closed between 2017 and 2022 were dairies without digesters according to the CADD. If the reduction in herd size for those dairies that ceased to exist were included in the herd size change of dairies without digesters, the data would not show that dairies without digesters grew from 2017 to 2022.

In case an example of this data manipulation is helpful, imagine 15 dairies all with 100 cows. Five have digesters (500 cows total), ten do not (1,000 cows total). Of the ten that do not have digesters, five cease operation and 400 of their 500 cows get dispersed evenly between dairies with digesters and those without. The five dairies with digesters now have 700 cows total and the dairies without digesters have 700 cows total. The annual population growth / decline rate of the five dairies with digesters is 8% and also 8% for the five without digesters *if you only count those dairies that survived*. A true and accurate picture of the performance of dairies without digesters would include the population loss of the five dairies that went defunct. Including that data, the population growth / decline rate of the ten dairies without digesters is *negative 6%*.

To accurately assess change, the analysis must include dairies that opened post 2017 as well as those closed by 2022 as we do in our analysis below.

c. CARB relies on an analysis of percent growth rate instead of a more accurate analysis of nominal growth

Looking for level change or nominal growth is more appropriate than percentage change or growth rate for evaluating the impact of a policy. First, nominal change is more relevant for evaluating environmental outcomes (one big dairy growing is likely to have more impact than two small dairies growing). Second, significant potential for error and misrepresentation is introduced by using relative growth instead of numeric change. These include failing to include new dairies (with an undefined baseline) as part of growth, placing more weight on change in small dairies, and creating situations in which a slower scale up period of a new dairy appears as a much larger growth rate in the summary statistics. In our analysis we looked at both absolute herd size changes and percent changes across various categories and time periods.

d. CARB excludes and / or mischaracterizes dairies with digesters that were implemented after 2022

CARB's classification of digester dairies and non-digester dairies may exclude several dairies from its analysis of the impact of digesters on growth rate and may misclassify digester dairies as non-digester dairies. CARB's analysis only includes in its digester dairies set dairies with digesters that are operational in 2022 and includes dairies in the non-digester dairy set if they did not have an operational digester or a digester under construction in 2022.⁷ This skews and / or confuses the data and analysis in two ways: it excludes dairies that should be included in the digester dairy set and may overinclude dairies in the non-digester dairy set.

⁷ Staff Presentation at Slide 46, https://ww2.arb.ca.gov/sites/default/files/2024-08/CARB_Dairy_Sector_Workshop_Staff_Presentation_08-22-2024.pdf.

Based on the wording on Slide 46 of Staff's presentation, it appears dairies with a digester under construction in 2022 are excluded from both classes (digester dairies and non-digester dairies) and, as such, excluded from CARB's analysis. It is unclear which dairies fall into the category. For example, is California Dairy Farms (CDF) Howard, which has a digester as of 2024, excluded from this analysis if its digester was under construction in 2022? If so, CARB is excluding a dairy with a digester that grew from 1,370 in 2017 to 4,500 in 2022 from its analysis.

Additionally, it is unclear which dairies that had digesters installed after 2022 had a digester under construction in 2022. If a dairy had neither a digester installed or in construction in 2022, it appears that it would fall in the non-digester category. For example would CDF, noted above, fall into the non-digester category if digester construction did not begin until 2023 and would its growth be attributed to the non-digester dairy class? What about Manuel Godinho Dairy, which the CADD indicates will have a digester but does not indicate which year the digester will be operational? That dairy grew from 1800 to 4072 mature cows between 2017 to 2022. Is Godinho's growth excluded altogether, or is it misallocated to the non-digester dairy group?

Dairies with planned digesters should be included in the "digester dairies" category. Factory farm gas developments are long-term business plans and it defies economic logic to presume that operators would never consider increasing available feedstock for a digester before and in anticipation of constructing the digester.⁸ Accordingly, in our analysis we include dairies with digesters and with planned digesters in the digester dairy set. As an alternative we also conduct an analysis that excludes dairies that have planned digesters, according to the CADD, but no digester installed by 2022.

e. CARB does not explain the methodology of its "weighted mature cow herd size data of non-digester dairies"

CARB's analysis concludes that the growth rate of large (1000+ mature cows) non-digester dairies is 0.8 percent compared to the overall growth rate of 1.3 percent for digester dairies.⁹ On the following slide CARB arbitrarily shifts to an analysis that relies on "weighted mature cow herd size data of non-digester dairies that had a similar herd size distribution to the digester dairies" to conclude that growth at similar sized dairies with and without digesters are both equal to 1.3 percent.¹⁰ CARB provides no further information as to the methodology that supports this conclusion, including what is meant by "weighted mature cow herd size data" or what dairies were included in that analysis. Presumably that analysis continues to exclude dairies that shuttered between 2017 and 2022 and either excludes or misclassifies dairies that did not have an operational digester in 2022 but did have a digester by 2023 or 2024 or planned for a future date.

f. The methodology that CARB uses to define a large dairy is unclear

⁸ In fact, Commenters have repeatedly provided specific examples of this kind of conduct, where expansion happens before or in tandem with digester and biogas production plans. See Leadership Counsel for Justice and Accountability et al., Petition for Reconsideration at 11–13, <https://ww2.arb.ca.gov/sites/default/files/2022-04/2022-03-28%20-%20Petition%20for%20Reconsideration%20%28TOC%20Updated%29.pdf>.

⁹ *Id.* at Slides 47 & 48.

¹⁰ *Id.* at Slide 49.

CARB defines large dairies as dairies of at least 1,000 mature cows but does not explain how and when it applies that 1,000 cow cut-off to the data.¹¹ Of particular concern is that the evaluation of size is sensitive to the year that is chosen to represent the dairy's size category. For example, if 2022 is chosen as the year for setting 1000+ head dairies, dairies that shrank from 1,000+ head – including those that closed – are not considered large, thus biasing the category towards growth.

In the absence of a clear methodology from CARB, we use maximum size over the ten-year period (2012-2022) to define large dairies for comparative analysis. Therefore, any dairy that is 1000 head or more at some point between 2012 and 2022 we considered large.

3. Appropriate data analysis shows statistically significant relationships between digesters and dairy herd [growth/concentration] in California

To begin with the proper starting point, the question that needs answering is this: Is there evidence that the introduction of lucrative avoided methane crediting for dairy operations under the LCFS had led to increased herd sizes for dairies with either planned or operational digesters relative to those without?

We evaluated herd size between two five-year average periods, 2012–2016 and 2018–2022, for dairies with and without digesters. Our calculations find that herd size at digester dairies increased, on average, by 191 cattle between the two periods and fell by 124 on non-digester dairies. This difference in absolute change is statistically significant.¹² We also see that the percentage change in herd size increases, on average, over the time period in question by 7.7% on digester dairies and falls by 25.6% on non-digester dairies.¹³ This difference in percentage change is also statistically significant. We also find a statistically significant difference in the nominal and percentage change in herd size for dairies with and without digesters when we limit the sample size to dairies with over 1,000 head of cattle at some point between 2012 and 2022.¹⁴

We also show that from 2017 to 2022 digester dairies grew on average more than non-digester dairies – a statistically significant finding (in both absolute and percentage change). On average we find that digester dairies grew by 181 head while non-digester dairies shrank by 137 head.¹⁵ For 2017 to 2022 we also find statistically significant differences in relative and absolute growth of non-digester dairies and digester dairies when only including large dairies.¹⁶

We found similar trends even after replicating CARB's exclusion of digester dairies with operational dates after 2022 or no operational date from the data set. Though these exclusions are

¹¹ *Id.* at Slide 48.

¹² We define statistical significance as a P Value of <0.05.

¹³ See Commenters' CADD Data Analysis at Columns B and C of "Work (all)" sheet (included at Exhibit 2).

¹⁴ *Id.* at Columns B and C of 'Work (large)' sheet.

¹⁵ *Id.* at Columns F and G of 'Work (all)' sheet.

¹⁶ *Id.* at Columns F and G of 'Work (Large)' sheet.

not appropriate, our analysis shows that even when we did exclude those dairies from the analysis we found that across the five year period, there was a statistically significant difference in nominal herd size growth between digester dairies and non-digester dairies.

Finally, we used a difference-in-difference (DiD) analysis to assess the potential impact of the 2017 LCFS policy change on herd size trends of dairies with digesters compared to those without. A DiD analysis is used to “estimate the effect of a specific intervention or treatment (such as a passage of law, enactment of policy, or large-scale program implementation) by comparing the changes in outcomes over time between a population that is enrolled in a program (the intervention group) and a population that is not (the control group).”¹⁷ In our case, the intervention or treatment in question is whether an explosion in revenue generating potential for dairy digesters that occurred after 2017 as a result of changes to LCFS. Thus, our treatment group is dairies with digesters, and our control group is dairies without digesters. Table 1 reports results for the DiD analysis looking at all dairies in the CARB data and Table 2 reports results for the DiD analysis looking only at dairies with at least 1,000 head of cattle at some point in our sample period (2012-2022). Commenters’ DiD analyses tables are included here as Exhibit 3. Our pre-treatment period is average herd size between 2012-2017 and our post-treatment period is average herd size 2017-2022.

The estimated coefficient in question for the two DiD analyses is “TREAT:TIME” which is an interaction term between the time and treatment variables. This coefficient reports “how much the average outcome of the treatment group has changed in the period after the treatment, compared to what would have happened to the same group had the intervention not occurred.”¹⁸ In our case it provides evidence as to whether the post-2017 increase in incentives increased herd size on dairies with digesters. Both tables show that after 2017 there is increased herd size on dairies with digesters, on average, by 152 head for all dairies (Table 1) and 156 for large dairies (Table 2). We also ran the analysis excluding dairies that had digesters installed or planned for installation post 2022 (Table 3). We found an average increased herd sizes of 112 head for all / large digester dairies even when excluding that portion of digester dairies. All models report statistically significant results at the 99% confidence level. In these analyses we also controlled for overall herd size.

Conclusion

We urge CARB to reject the CADD and disregard Staff’s flawed analysis of what the CADD tells us about California dairy herds. CARB should stop using methodologies that appear designed to reach conclusions that insulate CARB from having to acknowledge the perverse effects of its programs. We further request CARB not rely on the CADD in the Low Carbon Fuel Standard (LCFS) rulemaking and associated environmental analyses or consideration of SB 1383 direct regulation of manure methane emissions until CARB addresses the problems raised herein. Finally, we join advocates from throughout the state in urging CARB to immediately initiate SB 1383 rulemaking to establish equitable and effective regulation of manure methane while rejecting Staff’s proposed decades-long exemption from any such regulations that appeared in

¹⁷ See, e.g., Columbia Mailman School of Public Health, *Difference-in-Difference Estimation*, <https://www.publichealth.columbia.edu/research/population-health-methods/difference-difference-estimation>.

¹⁸ <https://ds4ps.org/PROG-EVAL-III/DiffInDiff.html#the-coefficients>.

the Second 15-Day Changes to the LCFS Rulemaking.

Sincerely,

Jamie Katz
Phoebe Seaton
Leadership Counsel for Justice & Accountability
Central Valley Defenders of Clean Water & Air

Brent Newell
Law Office of Brent J. Newell

Tyler Lobdell
Food & Water Watch

Christine Ball-Blakely
Animal Legal Defense Fund

Exhibit 1

	DairyName	Facility Address	County Dairy ID	Entitlement Status	County Project No.	Total Head Reported to County												Last Inspection Date	Next Inspection	Dairy Consultant	New Permit Needed?	County Permitted Milking Cows	Water Board Mature Cow Limit**	County Permitted Head	Air District Head Limit		
						2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022										
290	Horizon Jerseys	8798 AVE 160, Tipton	336	Use Permit	PSP97-060	9947	10381	10062	10314	11382	11582	11510	11510	6940	5875	0	9800			ME		4000	6613	7416	10430		
291	Fern Oaks Farms	17001 Avenue 160, Porterville	337	Use Permit	PSP05-091	7492	6672	6660	6666	6666	6666	6576	6551	550	9495	6831	6850	10/8/2020	2026	LDC		1500	4054	2610	7285		
292	John Vander Poel Dairy	8001 Road 104, Pixley	339	Use Permit	PSP00-077	9290	9270	9262	9254	9254	9254	0	9345	3395	0	9466	9428			IAS		5100	5290	8576	9381		
293	Schott Dairy	13602 Road 96, Tipton	342	Use Permit	PSP94-076	4352	4315	4315	4317	4330	4338	3385	3385	0	0	0	0			IAS	PSP (AA) 22-017	1600	2133	2920	4487		
294	Curti Family Farms	19493 Road 30, Tulare	344	Grandfathered	MDL73-140	610	600	563	565	565	595	600	600	0	0	600	600				Need Admin Use Permit	116	606	265	700		
295	Hilarides Dairy	24163 Road 188, Lindsay	346	Use Permit	PSP99-044	14050	14040	14020	14022	14022	14022	14022	13951	0	0	13815	15743	10/7/2020	2026	LDC		9100	11100	7701	16200		
296	South Creek Dairy	11450 Avenue 64, Earlimart	350	Use Permit	PSP97-068	4269	4297	4326	4372	4293	4332	4329	4362	0	0	5299	4522			IAS		3200	2887	4285	7905		
297	Western Pacific Dairy	14854 Avenue 120, Pixley	351	Use Permit	PSP98-017	1990	2460	2620	2621	2646	2961	2698	2752	2460	4517	2449	2430			IAS		1450	1700	3207	3730		
298	Dairyland Farms	15920 Road 152, Tipton	352	Use Permit	PSP98-102	4345	5870	5885	5295	4550	4550	6760	6697	6678	2520	6535	6478	10/26/2020	2026	LDC		2975	3082	4047	5970		
299	Cow Palace Dairy	5595 Avenue 96, Pixley	353	Use Permit	PSP98-061	11625	11553	11573	11578	11597	11214	0	0	0	6671	8995	0	11/16/2022	2028	SAS		5832	7222	10240	11337		
300	Borba & Sons Dairy	13010 Avenue 120, Pixley	354	Use Permit	PSP93-104	1343	961	1265	1219	1078	1048	1095	0	0	9015	0	0	7/8/2021	2027	4-Creeks		1200	828	2108	1109		
301	Twin River Ranch	5053 Avenue 88, Alpaugh	355	Use Permit	PSP98-113	2053	2055	2075	2079	2095	2067	2069	2000	1995	0	2034	2033					1700	2060	2040	2465		
302	Vanderham West Dairy	2900 Avenue 112, Tipton	356	Use Permit	PSP00-076	7380	7425	7421	7404	7429	6492	6801	6783	7357	2042	9020	6743				PSP (AA) 22-041 Approved 7/26/2022	No Limitation	++	13810	13810		
303	Jake de Groot Dairy	17247 Avenue 232, Tulare	357	Use Permit	PSP98-073	3508	3433	3426	4144	4168	4162	4484	4365	4650	6770	4645	4585			IAS		4000	XX		5100		
304	Alonso Dairy - Pixley	11275 Road 96, Pixley	358	Use Permit	PSP98-055	4052	4088	3360	3468	3391	3504	4417	4387	4232	4660	4400	4260					2550	2950	4283	5535		
305	Decade Dairy	3313 Avenue 256, Tulare	359	Use Permit	PSP99-121	2940	3888	3917	3908	3949	3949	0	5840	0	4239	7260	7190			IAS	MIM 21-040 Approved 3/31/2022	4080	3072	9542	9952		
306	Bar VP Feedlot	10199 Avenue 96, Pixley	362	Use Permit	PSP04-118	2918	2901	2885	2877	2988	2988	0	6900	3307	0	3395	3470			IAS		3200	4087	5919	4310		
307	Mineral King Dairy	33803 Road 108, Visalia	364	Use Permit	PSP03-030	6461	6470	6475	6480	6480	6378	6414	6675	7843	0	6867	6835	11/15/2022	2028	SAS		3320	4485	6429	7704		
308	Rijlaarsdam Dairy	35185 Road 52, Kingsburg	367	Use Permit	PSP99-052	0	1605	1605	1605	1605	1605	0	0	1740	0	1680	1666			SAS		3160	++	6196	7237		
309	Williams Family Farms	6801 Avenue 120, Pixley	369	Use Permit	PSP03-044	5479	10766	10780	10790	10814	10820	9148	9234	10599	0	10896	10813			IAS		4800	XX	9501	11671		
310		0 13897 Road 120, Tulare	389	Use Permit	PSP99-058	4981	4981	4981	4981	4981	4981	0	0	0	0	0	0										
311	FM Jerseys	16301 Road 124, Tulare	396	Use Permit	PSP05-060	0	0	0	0	0	0	0	0	27	3870	3852	3841	11/20/2020	2026	LDC		3200	3840	3200	3872		
Total: 310 - 11 Closures - 4 Conversions to Feedlots = 295 Dairies						928,492	909,812	897,920	904,550	914,208	922,995	821,441	869,680	660,815	601,573	767,461	813,441										
LDC = Livingston Dairy Consulting																											
Dairy Totals:																											

** The Water Board defines a mature cow as a dairy cow that has produced milk at any time during its' life.
++ Indicates the facility is not permitted as a dairy or no record.
XX - Indicates a facility is in the permitting process with the agency.

Exhibit 2
(see separately attached data
spreadsheet)

Exhibit 3

Table 1 – All Dairies

Call:

```
lm(formula = LEVEL ~ SIZE + TREAT * TIME, data = ALL)
```

Residuals:

Min	1Q	Median	3Q	Max
-3282.1	-21.5	54.2	78.3	1782.5

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)	
(Intercept)	-51.566623	7.794703	-6.616	4.40e-11	***
SIZE	0.989135	0.004393	225.178	< 2e-16	***
TREAT	5.990962	23.318068	0.257	0.797	
TIME	-3.632252	9.911557	-0.366	0.714	
TREAT:TIME	151.872559	29.583601	5.134	3.03e-07	***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 247.7 on 2851 degrees of freedom

(316 observations deleted due to missingness)

Multiple R-squared: 0.9644, Adjusted R-squared: 0.9643

F-statistic: 1.93e+04 on 4 and 2851 DF, p-value: < 2.2e-16

Table 2 – Dairies over 1,000 Head

Call:

```
lm(formula = LEVEL ~ SIZE + TREAT * TIME, data = LARGE)
```

Residuals:

Min	1Q	Median	3Q	Max
-3291.4	-34.7	64.0	105.9	1764.4

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)	
(Intercept)	-58.515734	19.198208	-3.048	0.002349	**
SIZE	0.992240	0.007408	133.946	< 2e-16	***
TREATY	-0.198418	32.809397	-0.006	0.995176	
TIME	-0.878151	20.561184	-0.043	0.965940	
TREATY:TIME	155.511379	43.048811	3.612	0.000315	***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 330.8 on 1339 degrees of freedom
(60 observations deleted due to missingness)

Multiple R-squared: 0.9482, Adjusted R-squared: 0.948

F-statistic: 6123 on 4 and 1339 DF, p-value: < 2.2e-16

Table 3 – CARB excluded data

Call:

```
lm(formula = LEVEL ~ SIZE + TREAT * TIME, data = EXCL)
```

Residuals:

Min	1Q	Median	3Q	Max
-3279.9	-16.3	54.1	78.2	1801.9

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)	
(Intercept)	-50.94183	7.88879	-6.457	1.25e-10	***
SIZE	0.98848	0.00458	215.834	< 2e-16	***
TREAT	30.66395	28.21816	1.087	0.2773	
TIME	-3.57298	9.90558	-0.361	0.7183	
TREAT:TIME	112.27539	35.73490	3.142	0.0017	**

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 247.6 on 2743 degrees of freedom
(316 observations deleted due to missingness)

Multiple R-squared: 0.9626, Adjusted R-squared: 0.9625

F-statistic: 1.764e+04 on 4 and 2743 DF, p-value: < 2.2e-16

EXHIBIT B

See Separately Attached Excel Spreadsheet

EXHIBIT C

‘More manure means more energy’: Iowa dairies with biogas digesters are growing their herds, which concerns water quality advocates

Review shows 23% boost in animal units

By Erin Jordan, - correspondent

Nov. 3, 2024 5:30 am, Updated: Nov. 6, 2024 1:03 pm



Technician Blake Iske looks out over farmland adjacent to the Marshall Ridge Renewable Energy Center in State Center on Sept. 18. The facility's three anaerobic manure digesters extract methane from dairy cow manure. (Nick Rohlman/The Gazette)

STATE CENTER — The 8,000 Holsteins that make the feedstock for the \$42 million Marshall Ridge Renewable Energy Center are barely visible — just a flash of black-and-white hide behind the screens of a confinement building in central Iowa.

But the nearly 200,000 gallons of manure the dairy cows produce each day feed three anaerobic digesters that capture methane — a potent greenhouse gas — from the manure and turn the gas into renewable fuel that can be sold for big-time profits.

“More cows and more manure means more energy,” said Karl Crave, vice president for operations at [Dynamic Renewables](#), a Wisconsin company that owns and operates the Marshall Ridge center.

The Biden Administration has lauded on-farm digesters for reducing methane emissions from livestock, spending [\\$200 million on projects](#) across the country in 2021 alone. Large digester facilities can earn tens of thousands of dollars per day by pumping renewable natural gas to states like California with low-carbon fuel standards.

But critics say the climate benefit of methane capture from livestock is overshadowed by the potential harm caused by adding more animals — and their manure — in a state already plagued by water quality problems from farm runoff.

“If a farmer’s got 1,000 dairy cattle and he wants to put in a digester to generate natural gas to power his farm in some way, what do I care?” said Chris Jones, [president of the Driftless Water Defenders](#) and [author of “Swine Republic: Struggles with the Truth about Agriculture and Water Quality.”](#)

“If he puts in that digester and expands his herd from 1,000 to 5,000 and then is using public money to do all that and then it’s dressed up as some sort of climate change solution, I’m calling (an expletive) on that.”

The Driftless group has [filed two lawsuits](#) against Winneshiek County leaders for [approving a digester facility](#) in an area the group says has karst terrain. This porous topography, common in northeast Iowa, allows surface pollutants to quickly filter down to groundwater and streams. The Iowa Department of Natural Resources approved a permit for a digester at Full Bohr Farms Oct. 17.

Many digester sites boost herds

Iowa has permitted 15 new digester facilities since 2021, when [the Legislature passed a law](#) allowing animal feeding operations with digesters to exceed the state's limit of 8,500 animal units.

Seven of the 15 dairy farms added to their herds since they got digester permits, a review of DNR data shows. When you add up all 15 Iowa sites, animal units went from 84,861 before the sites got their digester permits to 104,424 after — a 23 percent increase.

What is an animal unit?

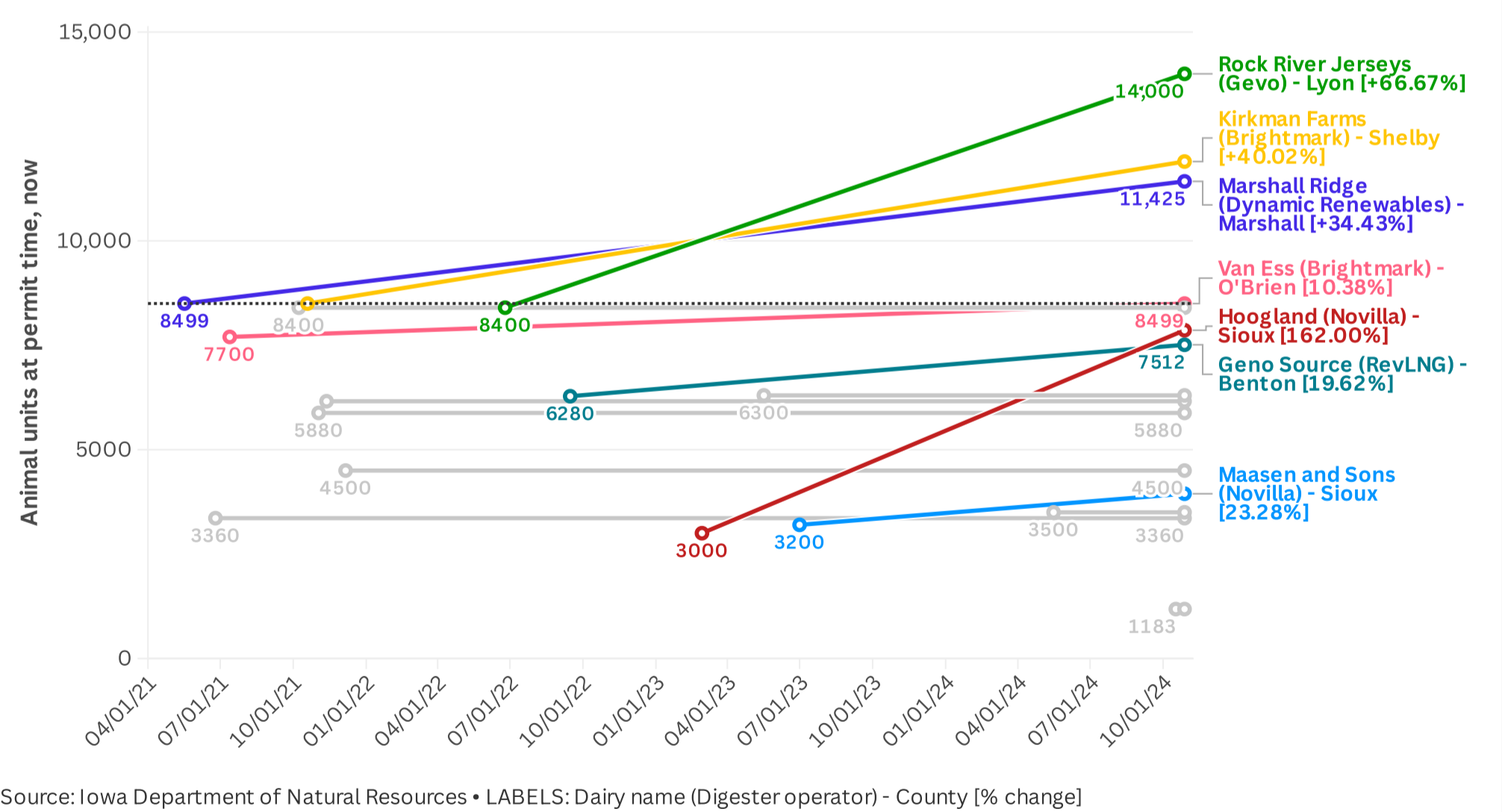
Because animals have different weights, animal units help standardize counts among various types of livestock. In Iowa, an animal unit equals 1,000 pounds of animal, or about the size of a beef cow. But a dairy cow is bigger, so each dairy cow is worth 1.4 animal units. A full-size hog is worth 0.4 an animal unit. For an animal unit conversion chart, go to the [Iowa Department of Natural Resources website](#).

The largest increase was at Hoogland Dairy, in Sioux County, which more than doubled its maximum animal units from 3,000 to 7,860 after a digester expansion. Iowa now has three dairies with more than 10,000 maximum animal units. All the state's new digesters are at dairy farms.

There's concern more manure may mean bigger spills — like one that happened Feb. 7, 2022, at Winding Meadows Dairy in Lyon County in northwest Iowa.

On-farm digester expansion in Iowa

Iowa has permitted 15 new digester facilities since 2021, when the Legislature passed a law allowing animal feeding operations with digesters to exceed the state's limit of 8,500 animal units.



* A Flourish chart

More than 376,000 gallons of liquefied manure leaked from a digester into Lizard Creek, a tributary of the Big Sioux River. The spill happened before the state had granted a construction certification, so the operator should not have been pumping manure into the tanks. The Iowa Department of Natural Resources fined Terry Van Maanen, who owned the dairy whose cattle supplied the manure for the digester, [\\$10,000](#).



Technician Blake Iske takes a sample from a digester at the Marshall Ridge Renewable Energy Center in State Center on Sept. 18. The facility's three anaerobic manure digesters extract methane from dairy cow manure. (Nick Rohlman/The Gazette)

[Colorado-based Gevo](#), which operates the digester at Winding Meadows and digesters at two other large northwest Iowa dairies, said the company made changes after the incident. “Working closely with the DNR, we translated DNR approved process improvement measures across our operation,” spokeswoman Heather Manuel said in an email.

Van Maanen was cited twice after the February 2022 spill. In April 2022, the DNR found manure leaking from a tile line and in January 2023, 500 gallons of manure “foam” was released from the digester, but did not enter a waterway, according to DNR records reviewed for this story. Van Maanen said last month he has sold the dairy.

Winding Meadows did not immediately expand after the digester was built, but new owner Joel Bleeker got a permit in May to boost the herd 45 percent after a new calf barn is built.

There have been other violations at dairies with digesters:

- Maassen & Sons Dairy, in Sioux County, was cited in June 2023 for starting to build a digester without a permit. The DNR cited the dairy in November 2023 for building piping to transport manure without having a permit. Regulators again dinged Maassen & Sons in April for failure to submit quarterly reports. Maassen & Sons increased its herd by 23 percent in the last couple of years.
- Roorda Dairy, in O'Brien County, was cited in November 2021 for starting to build a sand separation system for a digester without a permit. Roorda's herd size has not changed.
- Black Soil Dairy, in Sioux County, caused a fish kill in March 2023 when manure discharged from the dairy to Deep Creek, the DNR reported. Black Soil hasn't increased its herd since getting a digester permit.

Marshall Ridge project

[Marshall Ridge](#), which started operations near State Center in February 2023, takes manure from [Kevin and Holly Blood's dairy cattle](#), adds water and pumps the mix into one of three 1.3-million-gallon digesters.

Digester staff keep the manure at 100 degrees, providing a perfect environment for natural bacteria to break down the manure, Acting Facility Manager Michael Raymer said. The tanks are insulated against Iowa's cold winters.

The process releases gas, including methane, that is collected from the top of the digesters and filtered to remove water vapor, carbon dioxide and hydrogen to create renewable natural gas. [Black Hills Energy injects the compressed gas](#) into the Northern Natural Gas pipeline that runs underground near State Center.



Technician Blake Iske prepares to take a sample at the Marshall Ridge Renewable Energy Center in State Center on Sept. 18. The facility's three anaerobic manure digesters extract methane from dairy cow manure. (Nick Rohlman/The Gazette)



Digesters and a dairy barn are seen at the Marshall Ridge Renewable Energy Center in State Center on Sept. 18. The facility's three anaerobic manure digesters extract methane from dairy cow manure. (Nick Rohlman/The Gazette)



Manure is passed over a screen filter at the Marshall Ridge Renewable Energy Center in State Center on Sept. 18. The facility's three anaerobic manure digesters extract methane from dairy cow manure. (Nick Rohlman/The Gazette)



From left: Josh Viers, Mj Kelley, and Chad Baldwin monitor displays at the Marshall Ridge Renewable Energy Center in State Center on Sept. 18. The facility's three anaerobic manure digesters extract methane from dairy cow manure. (Nick Rohlman/The Gazette)

Government incentives for digesters

There are [thousands of on-farm digesters in Europe](#), but U.S. development has been slow until state and federal incentives.

The [Rural Energy for America Program](#) provides loans of up to 75 percent and grants for up to 25 percent for renewable energy systems, such as digesters. The Inflation Reduction Act offers tax credits that would defray the initial startup costs.

A digester pilot project in Iowa and Missouri [got \\$80 million](#) from the USDA’s Partnerships for Climate-Smart Commodities in 2022. Most of the money is used to incentivize farmers in southeast Iowa and northern Missouri to plant prairie and cover crops that will be harvested and fed into digesters to produce renewable natural gas, explained Will Higgins, development manager with Roeslein Alternative Energy.

“We are focused on restoring over 40,000 acres of prairie and incentivizing over 40,000 acres of cover crops,” he said.

The digester facility near Stockton will process the biomass with cattle manure from Sievers Family Farm. Iowa State University will monitor, measure, record and verify goals for the project.



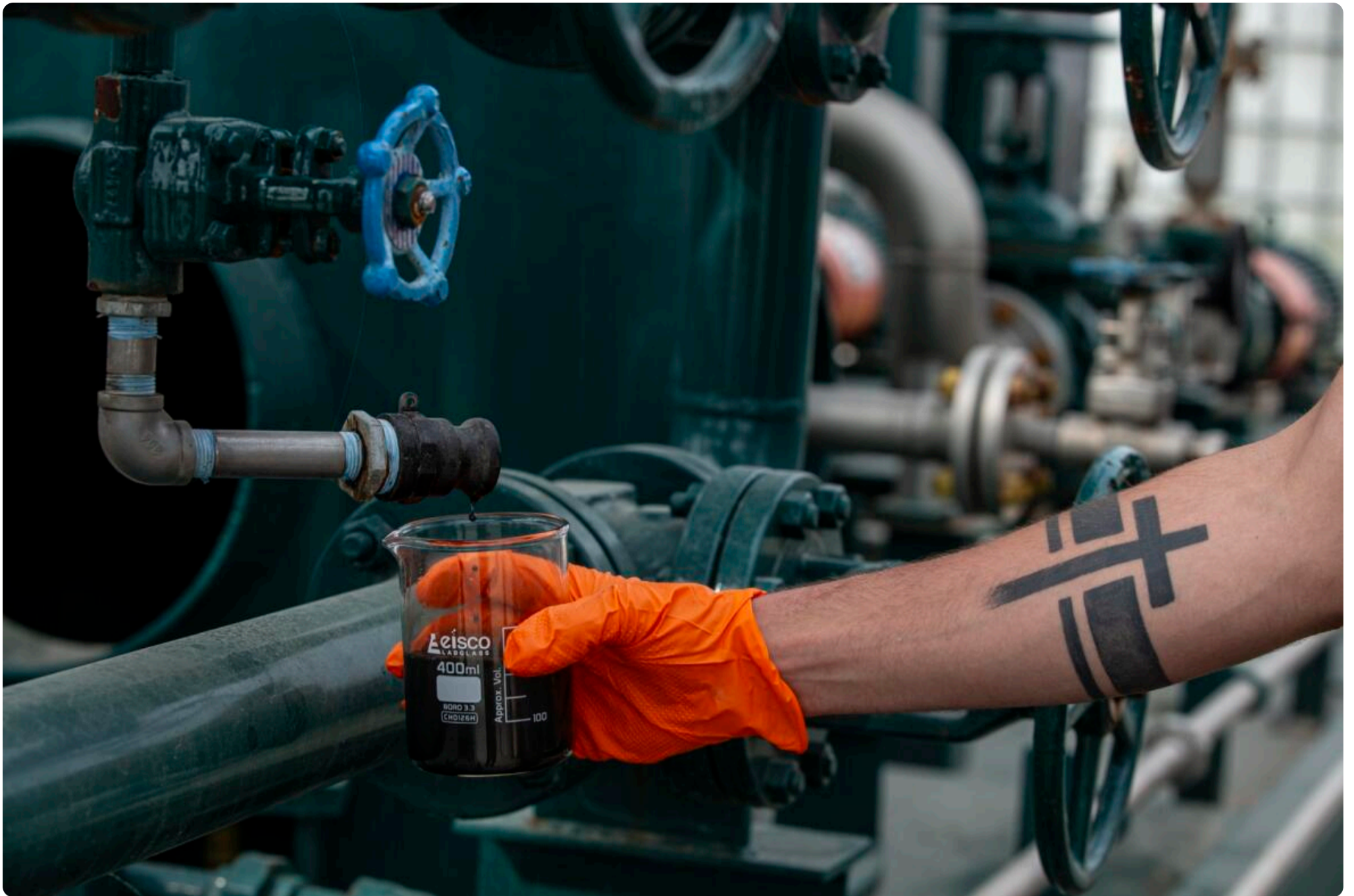
Technician Blake Iske descends a set of stairs after taking a sample measurement at the Marshall Ridge Renewable Energy Center in State Center on Sept. 18. The facility's three anaerobic manure digesters extract methane from dairy cow manure. (Nick Rohlman/The Gazette)



Dairy barns and a gas pipeline at the Marshall Ridge Renewable Energy Center in State Center on Sept. 18. The facility's three anaerobic manure digesters extract methane from dairy cow manure. The Marshall Ridge project produces 250 and 325 MMBTU of renewable natural gas per day. (Nick Rohlman/The Gazette)



MJ Kelley looks over screen filters at the Marshall Ridge Renewable Energy Center in State Center on Sept. 18. The facility's three anaerobic manure digesters extract methane from dairy cow manure. (Nick Rohlman/The Gazette)



Blake Iske takes a sample at the Marshall Ridge Renewable Energy Center in State Center on Sept. 18. The facility's three anaerobic manure digesters extract methane from dairy cow manure. (Nick Rohlman/The Gazette)

Cutting ag emissions

Iowa [ranks No. 2](#), behind Texas, for greenhouse gas emissions from agriculture.

"Manure causes about 10 percent of U.S. methane emissions," said Mike Helbing, staff attorney for Penn State University's Center for Energy Law and Policy. "If these methane emissions are captured, it's a great benefit for the environment."

California is driving the development of anaerobic digesters across the farm belt. California requires fuel producers there to stay below certain carbon intensity thresholds or buy credits from low-carbon fuel producers in California or other states. If a digester facility in Iowa can supply Renewable Natural Gas to a pipeline that goes to California, the digester facility can sell its credits to California companies.

"If you're producing RNG, even in the state of Iowa, you're creating a renewable fuel that is generally going to come in lower (in carbon intensity) than State of California standard," Helbing said.

The credits can bring the value of RNG [as high at \\$100](#) per metric million British Thermal Units (MMBTU), but Helbing says \$27 to \$30 per MMBTU is a more likely value at this time.

The Marshall Ridge project produces 250 and 325 MMBTU of renewable natural gas per day. Gevo plans to produce 440,000 MMBTU of renewable natural gas a year at the northwest Iowa digesters, [according to its website](#).

Some economists question whether anaerobic digestion from cow manure is worth the cost.

"Digester revenue has been substantially higher than the value to society of prevented methane emissions," Aaron Smith, professor of [Agricultural and Resource Economics](#) at the University of California, Berkeley, wrote in an [April 2023 analysis](#) of the value of methane from cow manure. "This means that society is overpaying for these methane reductions. The cost is paid by producers of gasoline and diesel, who buy LCFS (low-carbon fuel standard) credits and pass the cost along to consumers in the form of higher fuel prices."

Smith suggests dairy farmers pay the cost of reducing methane emissions.

The potential biogas from digesters at swine and dairy operations in the United States, according to a [2018 EPA report](#), is less than 1 percent of the total natural gas used in the United States in 2019, according to a [report from the U.S. Energy Administration](#).