November 4, 2026

Lauren Sanner
Washington State Department of Ecology
Climate Pollution Reduction Program

Re: Informal Comments on WA-GREET 4.0

Ms. Sanner and Department of Ecology,

The undersigned organizations provide these comments on the Department of Ecology's proposed WA-GREET modeling and simplified calculators for use in the Clean Fuel Standard (CFS). These comments focus on the carbon intensity (CI) scores for biomethane derived from dairy or swine manure, or factory farm biogas. Ecology must ensure that these tools produce accurate CI scores for factory farm biogas and advance the state's goal of a cleaner transportation sector.

It is critical that Ecology not make the same mistakes California is making in its similar Low Carbon Fuel Standard and allow the CFS to become a profit center for factory farm pollution. Unrestrained avoided methane crediting for factory farm biogas in that program is perversely rewarding factory farms for getting bigger and polluting more, while also distracting from real climate solutions in the agricultural sector. Center for Food Safety, Food & Water Watch, Friends of Toppenish Creek, and Friends of the Earth provided comments to Ecology's informal comment period in March explaining this in detail. We provide those comments again, attached here as Attachment A. We reiterate and incorporate them in full. Ecology must learn from the mistakes of California and ensure that factory farm biogas incentives do not compromise the CFS and Washington's climate progress.

We offer the following comments so that Ecology can avoid the worst of the problems associated with factory farm biogas and associated fuels[1]:

- Restrain avoided methane crediting in WA-GREET and calculators
- Ensure accurate well-to-wheel life cycle analysis
- Do not facilitate biomethane-to-electricity

[1] These include all applications of factory farm biogas and biomethane such as for hydrogen feedstock or process fuel, biomethane-to-electricity, or biomethane used to produce so-called sustainable aviation fuels.

1. **Restrain avoided methane crediting**

Ecology should adopt a conservative background value for factory farm biogas in WA-GREET 4.0 to reduce the perverse incentives of avoided methane crediting. These perverse outcomes are well understood and documented by a growing body of evidence as explained in detail in Attachment A. Ecology can lessen the adverse effects of allowing avoided methane crediting in the CFS by using the "generic counterfactual" carbon intensity approach recently used by New Mexico in adopting rules for its analogous Clean Transportation Fuel Program ("CTFP") and as developed by the U.S. Department of Energy for federal rulemakings under the Inflation Reduction Act. This is a more conservative approach specifically designed to address the perverse incentive risk associated with manure-derived fuels assigned negative carbon intensity values.

Ecology must "seek to adopt rules that are harmonized" with clean fuels programs in other states, including "compliance requirements and methods for credit generation."[20] New Mexico is the most recent state to create an analogous clean fuels program and reflects important lessons learned from earlier programs like California's. New Mexico adopted final rules for its CTFP including fuel pathway CI scores reflecting this more conservative approach.[2]

Restraining avoided methane crediting is a critical safeguard to keep the worst effects of the policy from compromising the CFS and rewarding factory farms for poor environmental performance. We request that Ecology adopt the conservative background value that reflects the more conservative generic counterfactual approach. Alternatively, Ecology could implement a lower bound of zero for CI values in WA-GREET 4.0, effectively prohibiting negative CI values altogether for factory farm biogas. That may prove a simpler approach and would be an even more protective solution to the problems of incentivizing these fuels.

2. **Ensure a well-to-wheel life cycle accounting in all factory farm biogas modeling**

As explained in the attached comments, Ecology should ensure accurate "well-to-wheel" life cycle accounting for factory farm biogas in the CFS. This includes accounting for up and downstream emissions and realistic leakage of intentionally produced methane. Ecology should

[2] NMAC 20.2.92.701 Tbl. 5 (showing CI scores of -15 and -25 for factory farm biogas-derived fuels).

ensure that all applications of the WA-GREET including all relevant Tier 1 Calculators for biomethane adopt these changes. Inaccurate lifecycle analyses will fundamentally undermine the integrity of the CFS.

3. Ecology should not encourage biomethane-to-electricity

Ecology should not facility or encourage the production of factory farm biogas in general, and the same applies to biomethane-to-electricity. In addition to the other many problems that come along with the perverse incentives of avoided methane crediting and factory farm biogas production, encouraging biomethane-to-electricity risks two more problems. Factory farms continue to use California's Low Carbon Fuel Standard to reap massive financial rewards for burning factory farm biogas in dirty, inefficient internal combustion engines.[3] Producing electricity from factory farm biogas in internal combustion engines produces large quantities of local air pollution but far less electricity than a conventional natural gas fired power plant, making it a highly polluting and inefficient process. Ecology should not repeat this absurdity in the CFS. Ecology should ensure that an energy efficiency benchmark for biomethane-to-electricity effectively disincentivizes these types of projects to the point that none will participate in the CFS.

Second, encouraging biomethane-to-electricity with a simplified calculator will distract from truly clean sources of electricity production to power the EVs of today and the future. As Washington moves toward increased adoption of EVs, it must also ensure those vehicles are powered with responsible, clean, and equitable electricity. Swapping one form of combustion for another is no solution, especially if that combustion is especially dirty and inefficient. Further, factory farm biogas causes disproportionate impacts in Washington communities, in particular in the Lower Yakima Valley, by rewarding factory farm practices that harm local water and air quality. Biomethane-to-electricity is an extension of that unjust treatment because it further incentivizes those practices. And if Ecology allows electricity production in internal combustion engines, it will result in even more air pollutants emitted into local communities. We request that Ecology not adopt any simplified calculators that will streamline or facilitate these harms, including a biomethane-to-electricity calculator.

[3] *See, e.g.*, Low Carbon Fuel Standard Tier 2 Pathway Application No. B0823: West Point RNG LLC, https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/fuelpathways/comments/tier2/b0823_cover.pdf.

For the reasons explained above and in the attached comments, we request that Ecology makes these changes to ensure the CFS leads Washington toward a cleaner transportation sector and real climate progress Washingtonians can be proud of.

Sincerely,

Tyler Lobdell
Food & Water Watch

Shemona Moreno
350 Seattle Climate Action

Coleen Anderson
350 Yakima Climate Action

Kingsly McConnell
Center for Food Safety

Jean Mendoza
Friends of Toppenish Creek

Daphne Wysham
Friends of the Earth

Kirsten Gregory
Pasado's Safe Haven

Attachment A

March 3, 2026

Washington Department of Ecology
Climate Pollution Reduction Program

Re: Comment in Response to Clean Fuels Standard Rulemaking Informal Comment Period, Chapter 173-424 WAC

The Center for Food Safety, Food & Water Watch, Friends of the Earth, and Friends of Toppenish Creek respectfully submit these comments in response to the Department of Ecology's (Ecology) proposed updates to the Clean Fuels Program Rule, WAC 173-424. These comments focus on Ecology's proposal to update the WA-GREET model. To achieve the Clean Fuel Standard's (CFS) climate objectives, Ecology must ensure that WA-GREET 4.0 uses rigorous, full life-cycle accounting that reflects the true "well-to-wheel" emissions from manure-derived biomethane (also known as factory farm biogas) production. Ecology should also apply its recently adopted "avoided methane crediting" for factory farm biogas in a careful and conservative way to reduce the perverse incentives built into the policy.

Despite widespread concerns from the undersigned commenters and others shared during Ecology's 2025 rulemaking, Ecology's CFS rules permit concentrated animal feeding operations (CAFOs) to utilize "avoided methane crediting" to determine the carbon intensity of factory farm biogas. Under this approach, factory farms can be rewarded for capturing manure methane emissions even when those emissions are *intentionally generated*. This raises a serious concern that the level of incentive granted by the CFS could increase perverse outcomes where CAFO operators are encouraged to maintain or expand their highly polluting operations, utilizing the most methane-intensive manure management strategies, in order to maximize credit generation and associated subsidies, thereby entrenching practices that harm the environment, the climate, and the health of nearby communities. This is already happening in response to other clean fuels programs that have allowed an unfettered race to the bottom with respect to factory farm biogas and avoided methane crediting. Ecology must guard against the CFS doing the same when updating WA-GREET.

To mitigate the perverse incentive effects of avoided methane crediting and ensure integrity in the CFS's well-to-wheel lifecycle accounting for factory farm biogas, we urge Ecology to:

- Adopt the generic counterfactual approach as a background value in WA-GREET 4.0 for avoided methane crediting and factory farm biogas; and
- Account for the full scope of greenhouse gas emissions from industrial livestock operations producing factory farm biogas to capture both the upstream and downstream emissions, as well as realistic fugitive emissions assumptions associated with its production in WA-GREET 4.0.

I. Interest of Commenters

Center for Food Safety

The Center for Food Safety is a public interest, non-profit membership organization that works to protect human health, the environment and climate by, among other things, curbing the proliferation of harmful food production technologies and by promoting sustainable agriculture. The Center for Food Safety represents over one million members nationwide who support sustainable agriculture and has approximately 25,000 members in Washington state. Center for Food Safety members in Washington live, work, and recreate in areas directly adjacent to polluting CAFOs and digesters, and care about or experience the impacts of factory farm biogas operations on air quality and climate.

The Center for Food Safety has engaged in legislative, regulatory, and legal advocacy to dispel the myth that factory farm biogas is "renewable" or a real solution to the climate crisis.[1] The Center for Food Safety has also invested significant resources into bringing mega-dairies in Washington into compliance with our federal laws protecting surface and groundwater, particularly the drinking water for residents of the Lower Yakima Valley.[2] As such, the Center for Food Safety has a serious interest in preventing the further entrenchment of large industrial dairies in the Yakima Valley and Washington state overall, where herd size increase is the inevitable outcome of making cow waste more profitable.The Center for Food Safety and its members thus have an interest in ensuring that WA-GREET 4.0 does not perpetuate harmful incentives that increase reliance on polluting factory dairies.

Friends of the Earth

Friends of the Earth, founded by David Brower in 1969, fights to create a healthy and just world. We are 4.7 million members and activists across all 50 states working to make this vision a reality. Our Food & Agriculture Program works to rapidly transition our food system to one that is sustainable, healthy, and just via markets and policy advocacy, strategic communications, organizing, and cutting-edge science. We seek three fundamental shifts in our food system: from toxic and chemical-intensive to healthy and ecologically regenerative; from corporate-controlled to democratically governed; and from a system that embodies the deepest inequities in our society to one that advances justice and fulfills the needs of all eaters now and in the future.

As part of this work, Friends of the Earth has raised significant concerns about the rapid expansion of anaerobic digesters on CAFOs and the growing public subsidies that support them, including through Washington's CFS. Factory farm biogas projects risk entrenching and incentivizing the continued growth and consolidation of industrial livestock production,

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[1] *See, e.g., Defensores del Valley Central para al Aire y Aqua Limpio v. Cal. Air Res. Board*. https://www.foodandwaterwatch.org/wp-content/uploads/2025/07/2025.07.25-Defensores-et-al.-v.-CARB-II-Petition-Complaint-Final.pdf.

[2] *See, e.g.*, *Cmty. Ass'n for Restoration of the Env't, Inc. v. Cow Palace, LLC*, 80 F. Supp. 3d 1180 (E.D. Wash. 2015) (holding that defendant Cow Palace dairy posed an imminent and substantial endangerment to the public in Yakima); *Cmty Ass'n for Restoration of the Env't, Inc. v. George Deruyter & Son Dairy*, 2:13-CV-03017 (E.D. Wash. 2013); *Cmty. Ass'n for Restoration of the Env't, Inc. v. D & A Dairy*, 2:13-CV-03018 (E.D. Wash. 2013); *Cmty. Ass'n for Restoration of the Env't, Inc. v. Henry Bosma Dairy*, 2:13-CV-03019 (E.D. Wash. 2013); *Cmty. Ass'n for Restoration of the Env't, Inc. v. R & M Haak, LLC*, 2:13-CV-03026-EFS (E.D. Wash. 2013).

deepening environmental and public health harms in already overburdened communities. Friends of the Earth advocates for policies across the country that prioritize the reduction of methane emissions at the source and ensure that climate and clean energy programs do not underwrite the expansion of factory farming.

Friends of Toppenish Creek

Friends of Toppenish Creek (FOTC) is a non-profit organization incorporated in Washington and located in Yakima County. FOTC is dedicated to protecting the rights of rural communities and improving oversight of industrial agriculture. FOTC operates under the simple principle that all people deserve clean air, clean water and protection from abuse that results when profit is favored over people. FOTC works through public education, citizen investigations, research, legislation, special events, and direct action, as well as providing public comments on proposed rules and development projects.

FOTC works tirelessly to protect the rights of our members and community against groundwater and air contamination generated by CAFOs. FOTC's members live in the Lower Yakima Valley and are encircled by CAFOs with historic, ongoing and well-documented records of pollution and adverse impacts.[3] Low-income, Hispanic, and indigenous people constitute most of the region's population and are disproportionately impacted by this factory farm pollution. FOTC members now also face threats to their health and safety due to a proposed biogas plant in the heart of the Lower Yakima Valley, which is only supported by the current regulatory framework's harmful incentives.[4] FOTC's organizational advocacy and individual members are injured by the avoided methane credit rule and the current WA-GREET model.

Food & Water Watch

Food & Water Watch is a national, nonprofit membership organization that mobilizes regular people to build political power to move bold and uncompromised solutions to the most pressing food, water, and climate problems of our time. FWW uses grassroots organizing, media outreach, public education, research, policy analysis, and litigation to protect people's health, communities, and democracy from the growing destructive power of the most powerful economic interests.

Food & Water Watch has worked extensively on issues related to factory farm biogas production and incentives. This includes research, public education, legislative and administrative advocacy, and litigation.

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[3] *See, e.g.*, Leah Beth Ward, *Hidden Wells, Dirty Water*, Yakima Herald Republic (October 12, 2008), https://www.yakimaherald.com/news/local/from-2008-hidden-wells-dirty-water-part-1-no-systemic-testing/article_4740dd5e-2a77-11ee-bc0b-cf5ce75ef088.html (Part 1) and https://www.yakimaherald.com/news/local/from-2008-hidden-wells-dirty-water-part-2-wheres-the-accountability/article_bd7fd6ae-2a78-11ee-bec7-3f4ff3c36eb8.html (Part 2); George Kimbrell and Sylvia Wu, *Facing facts about dairy pollution in Yakima Valley*, Capital Press (May 8, 2025), https://capitalpress.com/2025/05/08/facing-facts-about-dairy-pollution-in-yakima-valley/.

[4] Yakima Regional Clean Air Agency, *Draft Order of Approval for a Renewable Natural Gas (RNG) Production Facility* (February 2026), https://www.yakimacleanair.org/site/files/file_manager/page/shared/Order_of_Approval-Pacific_Ag_Renewables-February_2026.pdf.

II. Factory Farm Biogas Production Is Harmful

For years now, frontline communities and environmental advocates have raised environmental justice, public health, and market concerns about incentivizing factory farm biogas production.[5] The heavily polluting livestock facilities that factory farm biogas projects depend on generate massive amounts of waste that threaten rural economies, public health, and quality of life for those who live nearby, who are disproportionately communities of color and low-wealth communities.[6] CAFOs are often intentionally located in areas where marginalized communities lack the political or economic power to adequately address the negative impacts these industrial facilities have on their communities.[7] Moreover, many of these same communities are dealing with other forms of pollution and public health risks, creating cumulative impacts.

Most factory farms store the waste they generate as liquid wastewater in giant manure lagoons and periodically spread it on fields to dispose of it. The untreated waste, often spread in excess, can contaminate the soil and run off into waterways, causing harmful downstream effects.[8] Liquid manure also emits hazardous gases and particulate matter, causing toxic air emissions and noxious odor.[9] Studies have shown that people living near factory farms face higher risk and severity of respiratory illnesses, digestive issues, headaches, and other serious health conditions.[10] From a climate perspective, adding water to manure and storing it in these conditions generates high levels of methane emissions. These climate-harming emissions from

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[5] Friends of the Earth et al., *Letter to Secretary Vilsack and Undersecretary Torres Small* (June 13, 2023), https://foe.org/wp-content/uploads/2023/06/REAP-Letter-USDA-June-2023.pdf; Friends of the Earth et al., *Letter to Secretary Vilsack* (October 25, 2023), https://foe.org/wp-content/uploads/2023/10/Final_-Sign-on_-Opposition-to-Factory-Farm-Gas-Funding-and-Practices-in-IRA.pdf ; Press Release, Food & Water Watch, 160+ Groups from Across U.S. Call on CARB to Amend Disastrous California Pollution Credit Trading Scheme (Feb. 15, 2024), https://www.foodandwaterwatch.org/2024/02/15/160-groups-from-across-u-s-call-on-carb-to-amend-disastrous-california-pollutioncredit-trading-scheme/; Press Release, Leadership Counsel for Justice and Accountability, California Air Resources Board fails communities and state transportation goals with approval of staff's harmful approach to the Low Carbon Fuel Standard (Nov. 12, 2024), https://leadershipcounsel.org/california-air-resources-board-fails-communities-and-state-transportation-goals/.

[6] Rolf U. Halden & Kellogg J. Schwab, Environmental Impact of Industrial Farm Animal Production (2008), https://law.lclark.edu/live/files/6699-environmental-impact-of-industrial-farm-animal; Carrie Hribar, Nat'l Ass'n of Local Bds. of Health, Understanding Concentrated Animal Feeding Operations and Their Impact on Communities 2-3 (2010), https://www.cdc.gov/nceh/ehs/docs/understanding_cafos_nalboh.pdf; Am. Public Health Ass'n, *Precautionary Moratorium on New and Expanding Concentrated Feeding Operations* (Nov. 4, 2019), https://www.apha.org/policy-and-advocacy/public-health-policybriefs/policy-database/2020/01/13/precautionary-moratorium-on-new-and-expanding-concentrated-animal-feedingoperations; Letter from Friends of Toppenish Creek, Yakima County Air Quality Issues (Sept. 6, 2022), https://healthequity.wa.gov/sites/default/files/2022-09/Tab05b_Letters%20from%20Friends%20of%20Toppenish%20Creek_2022-09-15.pdf.

[7] Mary K. Hendrickson et al., The Food System: Concentration and Its Impacts 1 (2020), https://farmaction.us/wp-content/uploads/2020/11/Hendrickson-et-al.-2020.-Concentration-and-Its-Impacts-FINAL.pdf; Kelley J. Donham et al., *Community Health and Socioeconomic Issues Surrounding Concentrated Animal Feeding Operations*, 115 Environ Health Perspect 317, 318 (2007), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1817697/.

[8] *Id.*; Joan A. Casey et al., *Industrial Food Animal Production and Community Health*, 2 Current Envt'l Health Reports 259, 259-60 (March 2015); U.S. Env't Prot. Agency, Lower Yakima Valley Groundwater, https://www.epa.gov/wa/lower-yakima-valley-groundwater (last updated June 16, 2025).

[9] Maria C. Mirabelli et al., *Race, Poverty, and Potential Exposure of Middle-School Students to Air Emissions from Confined Swine Feeding Operations*, 114 Env't Health Perspectives 591-596 (2006), https://doi.org/10.1289/ehp.8586; Ji-Young Son, Marie Lynn Miranda & Michelle L. Bell, *Exposure to Concentrated Animal Feeding Operations (CAFOs) and Risk of Mortality in North Carolina, USA*, 799 Sci Total Environ 149407 (2021), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8530906/.

[10] *Id.* Christine Loftus et al., *Ambient Ammonia Exposures in an Agricultural Community and Pediatric Asthma Morbidity*, 26 Epidemiology 794 (2015), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4587379/.

manure are avoidable when the waste is not left to rot in anaerobic cesspools, and there are alternative manure management practices, such as composting and dry scraping, that emit far less methane.[11]

Yet Washington's CFS reinforces the very system that drives these harms. By allowing profitable "avoided methane" credits for factory farms, the program could further embed and incentivize high-methane liquid management systems (and their emissions) rather than lower-emission (and often far less expensive) alternatives. In contrast, smaller and more sustainable farms that manage manure through practices that largely avoid methane creation in the first place cannot convert their beneficial practices into revenue through the CFS.[12] The result is an absurd competitive advantage for large-scale livestock operations that first create methane-intensive waste systems and are then subsidized for capturing the pollution those systems generate.[13]

Not only does factory farm biogas production fail to address the aforementioned environmental and public health concerns from factory farms, but its production introduces new issues for communities living near CAFOs and biogas plants. These include increased production of ammonia pollution from anaerobic digestion,[14] higher concentrations of nutrients in digestate, the byproduct of digestion, which contribute to water pollution,[15] increased disruption and pollution from new pipelines and trucks to transport manure or biomethane through communities, and more toxic air pollution from biogas processing than is produced by fossil gas.[16] Ecology professes a commitment to environmental justice and addressing the disparate impacts of environmental pollution on low-income communities and communities of color.[17] Yet, Washington's CFS risks reinforcing and perpetuating those very inequities.

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[11] *See,* Cal. Dept. of Food and Agric., Recommendations for Short-Lived Climate Pollutants (June 2015), at 12–13, https://www.cdfa.ca.gov/oefi/climate/docs/SLCP_Reommendations.pdf ("[M]ethane emissions can be dramatically reduced – perhaps by more than 90 percent – when dry systems are used."). *See also* Ruthie Lazenby, Rethinking Manure Biogas 29 (2022), https://www.vermontlaw.edu/wp-content/uploads/2024/07/Rethinking_Manure_Biogas-1.pdf (Alternatives include, "solid separators that reduce methane-producing slurries; providing conservation assistance for transitions to alternative manure management systems, such as deep pits, composting, transitions to pasture, or other practices that have a lower greenhouse gas profile.").

[12] Ruthie Lazenby, Mitigating Emissions from California's Dairies: Considering the Role of Anaerobic Digesters in Mitigating Emissions from California's Dairies 16 (2024), https://law.ucla.edu/sites/default/files/PDFs/Publications/Emmett%20Institute/UCLA_Emmett_CA_Dairies_1%2018%2024.pdf.

[13] Kevin Fingerman et al., *Risks of Crediting Carbon Offsets in Low Carbon Fuel Standards: Lessons Learned from Dairy Biomethane*, 206 Energy Policy 114738 (2025), https://www.sciencedirect.com/science/article/pii/S0301421525002459.

[14] 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, 417-18 (2017), https://www.sciencedirect.com/science/article/pii/S0167880917300701; Thomas Kupper et al., *Ammonia and Greenhouse Gas Emissions from Slurry Storage – A Review*, 300 Agric., Ecosystems & Env't, 1, 14 (2020), https://www.researchgate.net/publication/341537214_Ammonia_and_greenhouse_gas_emissions_from_slurry_storage_-_A_review; Lowry A. Harper et al., *The Effect of Biofuel Production on Swine Farm Methane and Ammonia Emissions*, 39 J. Env't Quality 1984, 1989 (2010), https://www.eas.ualberta.ca/jdwilson/Harper_etal2010_jeq.pdf.

[15] *Id. See also,* NRCS, USDA, *Conservation Practice Standard: Anaerobic Digester Code 366*, at 366-CPS-8 to -9 (2023), https://www.nrcs.usda.gov/sites/default/files/2023-08/366_NHCP_CPS_Anaerobic_Digester_2023.pdf ("Land application of [digestate], compared with fresh manure, may have a higher risk for both ground and surface water quality problems" because "[c]ompounds such as nitrogen, phosphorus, and other elements become more soluble due to anaerobic digestion and therefore have higher potential to move with water.").

[16] Alarico Macor & Alberto Benato, *A Human Health Toxicity Assessment of Biogas Engines Regulated and Unregulated Emissions*, 10 Applied Sciences 1, 19 (2020), https://doi.org/10.3390/app10207048.

[17] *See generally* Wa. Dep't of Ecology, *Environmental Justice*, https://ecology.wa.gov/about-us/who-we-are/environmental-justice.

When programs like Washington's CFS give preferential treatment to factory farm biogas systems, these operations are encouraged to produce even more gas, in the most methane-intensive manner, to take advantage of the subsidies. Studies show this is often done by factory farms growing their herd sizes, ultimately increasing greenhouse gas emissions and exacerbating existing harm from CAFO pollution.[18]

While Ecology has already adopted the general framework of avoided methane crediting for factory farm biogas, it can still limit some of the most perverse outcomes by adopting the generic counterfactual baseline discussed below. Ecology must also ensure that the updated WA-GREET 4.0 fully accounts for the greenhouse gas emissions associated with factory farm biogas production, as outlined below. We ask that Ecology include these considerations in its rulemaking process and ultimately adopt them into WA-GREET 4.0.

III. Strengthen WA-GREET 4.0

In order to mitigate the perverse incentives associated with avoided methane credits and ensure proper well-to-wheel lifecycle analyses, Ecology should include a conservative background value for avoided methane crediting and should ensure that WA-GREET 4.0 accurately captures all greenhouse gas emissions associated with factory farm biogas production.

A. Ecology Could Reduce Perverse Incentives by Adopting a Conservative Baseline Value for Factory Farm Biogas in WA-GREET 4.0

Ecology should adopt a conservative background value for factory farm biogas in WA-GREET 4.0 to reduce the perverse incentives of avoided methane crediting. These perverse outcomes are well understood and documented by a growing body of evidence as explained above and in prior comments to Ecology.[19] Ecology can lessen the adverse effects of allowing avoided methane crediting in the CFS by using the "generic counterfactual" carbon intensity value recently used by New Mexico in adopting rules for its analogous Clean Transportation Fuel Program ("CTFP") and as developed by the U.S. Department of Energy for federal rulemakings under the Inflation Reduction Act. This is a more conservative approach specifically designed to address the perverse incentive risk associated with manure-derived fuels assigned negative carbon intensity values.

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[18] Varun Magesh et al., *Do Methane Mitigation Incentives Intensify Livestock Production? Evidence from California*, 2016-2025 (2025), https://dho.stanford.edu/wp-content/uploads/digesters.pdf; Chloe Waterman & Molly Armus, Biogas or Bull****? The Deceptive Promise of Manure Biogas as a Methane Solution 33-38 (2024), https://foe.org/wp-content/uploads/2024/02/Factory-Farm-Gas-Brief_final-final.pdf; Food & Water Watch, The Big Oil and Big Ag Ponzi Scheme: factory farm biogas 6 (2024), https://www.foodandwaterwatch.org/wp-content/uploads/2024/01/RPT2_2401_GreenwashingBiogas-WEB3.pdf; Erin Jordan, *Iowa Dairies with Biogas Digesters Are Growing Their Herds, Which Concerns Water Quality Advocates*, The Gazette (Nov. 4, 2024), https://investigatemidwest.org/2024/11/04/iowa-dairies-with-biogas-digesters-are-growing-their-herds-which-concerns-water-quality-advocates/.

[19] *See* Comments of Food & Water Watch et al. to Wa. Dep't of Ecology (Aug. 1, 2025), https://scs-public.s3-us-gov-west-1.amazonaws.com/env_production/oid100/did200118/pid_211471/assets/merged/go09ioqnyhj_document.pdf?v=45341; Comments of Friends of the Earth et al. to Wa. Dep't of Ecology (Aug. 1, 2025), https://scs-public.s3-us-gov-west-1.amazonaws.com/env_production/oid100/did200118/pid_211471/assets/attachments/74850/6i0hikheya1_document.pdf?v=44625.

Ecology must "seek to adopt rules that are harmonized" with clean fuels programs in other states, including "compliance requirements and methods for credit generation."[20] New Mexico is the most recent state to create an analogous clean fuels program, and therefore is instructive. In January 2026, New Mexico adopted final rules for its CTFP, and as part of that rulemaking utilized the "generic counterfactual" developed by the U.S. Department of Energy to set the carbon intensity value of fuels derived from factory farm biogas.[21] This resulted in a carbon intensity of -27.3 gCO_2e/MJ.[22]

The generic counterfactual approach eases the impact of the perverse incentives associated with avoided methane crediting by looking across manure management practices to establish an average carbon intensity for methane captured from manure management systems.[23] This still allows negative carbon intensity values for methane capture, but does not reward the biggest emitters for having adopted the most harmful, climate-intensive manure management practices. Because high manure methane emissions are a deliberate choice factory farms make when choosing how they will manage their waste and can be dramatically reduced with better management, this approach is the best way to avoid excessively rewarding the worst actors under Ecology's CFS regulations.

This is a different approach from other states' programs, such as California's Low Carbon Fuel Standard (LCFS), which allows applicants to input their own foreground data and can result in massively negative carbon intensity values as low as -790 gCO_2e/MJ. But by allowing applicants to input their own data into the CA-GREET models, California has enabled the perverse outcome where the biggest polluters get the biggest reward and factory farms intentionally adopt climate-intensive practices to lower their carbon intensity values to increase credit generation and profit.

This counterproductive response to clean fuels policies was exactly why the federal government developed the generic counterfactual for factory farm biogas. As the U.S. Department of Treasury explained, "the magnitude of the incentive provided by [Inflation Reduction Act] credit itself creates a significant risk of additional waste production in response to the credit" which "could result in additional emissions" that must be accounted for to ensure program integrity.[24] Therefore, the Department of Treasury worked with the U.S. Department of Energy to establish an administrable way of assigning carbon intensity values while also guarding against perverse incentives. The result was the generic counterfactual approach. This

[20] WAC 70A.535.060.
[21] New Mexico Environment Department, Testimony of Angela Raso (Exhibit 67) at 32–33, available at https://www.env.nm.gov/opf/wp-content/uploads/sites/13/2025/09/Ex-63-69.pdf.
[22] *Id.*
[23] See U.S. Department of Energy, A Generic Counterfactual Greenhouse Gas Emission Factor for Life-Cycle Assessment of Manure-Derived Biogas and Renewable Natural Gas (Jan. 2025), https://www.energy.gov/sites/default/files/2025-01/generic-counterfactual-greenhouse-gas-emission-factor-for-life-cycle-assessment-of-manure-derived-biogas-and-renewable-natural-gas_010225.pdf.
[24] Credit for Production of Clean Hydrogen and Energy Credit, 90 Fed. Reg. 2224, 2290 (Jan. 10, 2025); Section 45Y Clean Electricity Production Credit and Section 48E Clean Electricity Investment Credit, 90 Fed. Reg. 4006, 4080–81 (Jan. 15, 2025).

approach helps reduce perverse incentives because it does not reward the worst polluters with the most lucrative carbon intensity scores nor does it penalize operators that effectively reduce their manure methane emissions with simple interventions like liquid-solid separation (but that do not produce biogas and therefore do not generate CFS credits).

While the generic counterfactual approach does not eliminate all potential for perverse incentives to materialize and undermine the CFS and Washington's climate efforts, it is a simple way to limit the adverse effects of allowing avoided methane crediting. Therefore, Commenters ask that Ecology adopt the generic counterfactual approach as a background value in WA-GREET 4.0.

B. WA-GREET 4.0 Must Account for Upstream and Downstream Emissions

Ecology must ensure that WA-GREET 4.0 accounts for the full climate impacts of the industrial livestock operations producing factory farm biogas, particularly if the agency is going to claim the CFS reduces greenhouse gas emissions from animal agriculture.[25]

Animal agriculture is a major contributor to climate change, responsible for approximately 36 percent of U.S. methane emissions,[26] 20 percent of global greenhouse gas emissions and 57 percent of food-related emissions.[27] Biomethane production requires constant and large volumes of livestock manure–and thus livestock. Since the livestock sector's greenhouse gas emissions do not begin at manure storage, neither should the life-cycle analysis for manure-derived biomethane under the CFS. To be grounded in reality, WA-GREET 4.0 must capture all of the emissions associated with factory farm biogas production. This encompasses all upstream emissions from livestock production, including emissions associated with feed production and transportation, enteric emissions, and emissions from the collection and transportation of manure to the lagoons, among others.[28] An accurate life-cycle analysis requires accounting for all downstream emissions as well. In particular, this includes the increased greenhouse gas emissions when operators store and dispose of digestate, which releases high rates of both methane and nitrous oxide.[29]

C. WA-GREET 4.0 Must Account for Realistic Fugitive Emissions Assumptions

WA-GREET 4.0 must also assume realistic fugitive emissions from digesters and related infrastructure. Research has shown that digesters and biogas supply chains regularly leak,

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[25] Lazenby, *supra* note 7 at 19. In its Final Regulatory Analyses, Ecology does claim that allowing avoided methane crediting is "in the interest of mitigating methane emissions and meeting the state's greenhouse gas emissions reduction targets," already indicating that the CFS will reduce greenhouse gas emissions from the livestock sector. WASH. STATE DEP'T OF ECOLOGY, FINAL REGULATORY ANALYSES: CLEAN FUELS PROGRAM RULE 131 (2025), https://apps.ecology.wa.gov/publications/documents/2514093.pdf.

[26] U.S. Env't Prot. Agency, *Methane Emissions*, (Jan. 7, 2025), https://www.epa.gov/ghgemissions/methane-emissions.

[27] Walter Willett, MD et al., *Food in the Anthropocene: the EAT-Lancet Commission on Healthy Diets from Sustainable Food Systems*, THE LANCET (January 16, 2019), https://doi.org/10.1016/S0140-6736(18)31788-4; Andrea Thompson, *Here's How Much Food Contributes to Climate Change*, SCIENTIFIC AM. (Sep. 13, 2021), https://www.scientificamerican.com/article/heres-how-much-food-contributes-to-climate-change.

[28] *Id.*; Lazenby, *supra* note 7 at 18.

[29] Holly et al., *supra* note 9.

releasing additional greenhouse gases into the atmosphere, further undermining any climate mitigation potential of this approach.[30] In California, CA-GREET uses a default methane capture efficiency of 95 percent for lagoon digesters and 98 percent for fully enclosed vessels, unless a pathway applicant discloses otherwise.[31] However, the state does not monitor emissions at the facility level, and so it would not be aware of any fugitive emissions. In fact, a 2023 paper estimated methane emissions from dairies in California using mobile optical remote sensing and found that facilities presumed to have digesters did not emit significantly less methane than facilities without digesters.[32] Across all CAFOs in the study, measured methane emissions were 60% higher than the rates reported in the California Air Resources Board (CARB) inventory.[33] This is consistent with other research that has shown that biogas systems emit methane at a far higher rate than regulatory bodies estimate.[34] WA-GREET 3.0 uses the exact same default methane capture efficiency as CA-GREET, and, like CARB, Ecology has no plan to monitor digesters or any associated infrastructure once these items are installed.[35] Thus, in light of the evidence, the baseline assumption by the agency cannot be that every biogas system is working perfectly. Instead, we urge Ecology to consider the best available science on leakage rates across the supply chain and account for it in WA-GREET 4.0 accordingly.

IV. Conclusion

The undersigned commenters request Ecology strengthen the integrity of WA-GREET 4.0 by adopting the generic counterfactual approach in its final rulemaking, accounting for upstream and downstream emissions of operations that produce factory farm biogas, and also accounting for realistic fugitive emissions from factory farm biogas infrastructure. We appreciate the opportunity to provide feedback during this informal comment period on the proposed updates to the Clean Fuel Program rules.

Sincerely,

Tyler Lobdell
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[30] *See* Semra Bakkaloglu et al., *Methane Emissions Along Biomethane and Biogas Supply Chains Are Underestimated*, 5 One Earth 724–736 (June 17, 2022), https://www.sciencedirect.com/science/article/pii/S2590332222002676; Yuanrong Zhou et al., Life-Cycle Greenhouse Gas Emissions of Biomethane and Hydrogen Pathways in the European Union (2021), https://theicct.org/sites/default/files/publications/lca-biomethane-hydrogen-eu-oct21.pdf; Thomas K. Flesch, Raymond L. Desjardins & Devon Worth, *Fugitive Methane Emissions from an Agricultural Biodigester*, 35 Biomass & Bioenergy 3927 (2011), https://www.sciencedirect.com/science/article/abs/pii/S0961953411003333.

[31] CARB, Tier 1 Calculator for Biomethane from Anaerobic Digestion of Dairy and Swine Manure, https://ww2.arb.ca.gov/resources/documents/lcfs-life-cycle-analysis-models-and-documentation (Reference Tab, Table A.3).

[32] N. T. Vechi et al., *Ammonia and Methane Emissions from Dairy Concentrated Animal Feeding Operations in California, Using Mobile Optical Remote Sensing*, 293 Atmospheric Environment 119448 (2023), https://www.sciencedirect.com/science/article/pii/S1352231022005131.

[33] *Id.*

[34] Bakkaloglu et al., *supra* note 18; Food & Water Watch, The Proof Is in the Pluming: Factory Farm Biogas Has no Place in the Low Carbon Fuel Standard (Feb. 2024), https://www.foodandwaterwatch.org/wp-content/uploads/2024/01/RB_2401_LCFS_Methane.pdf.

[35] *See*, Wa. Dep't of Ecology, Tier 1 Fuel Calculators, Dairy and Swine Manure, https://ecology.wa.gov/air-climate/reducing-greenhouse-gas-emissions/clean-fuel-standard/fuel-pathways-and-carbon-intensity (Reference Tab, Table A.3).

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