April 29, 2021

Clean Air Task Force Comments on Bioenergy and Methane Abatement *in response to*

US Department of Agriculture, Notice of Request for Public Comment on the Executive Order on Tackling the Climate Crisis at Home and Abroad, 86 Fed. Reg. 14403 (March 16, 2021)

The Clean Air Task Force (CATF) seeks to help safeguard against the worst impacts of climate change by working to catalyze the rapid global development and deployment of low carbon energy and other climate-protecting technologies, through research and analysis and public advocacy leadership. CATF appreciates the opportunity to provide the following comments on bioenergy and methane abatement in response to questions posed by the US Department of Agriculture (USDA) in its March 16, 2021 request for public input on how the Department might "tackl[e] the climate crisis at home and abroad."[1]

Bioenergy

USDA asks how it might "utilize programs funding and financing capacities, and other authorities to encourage greater use of biofuels for transportation, sustainable bioproducts (including wood products), and renewable energy?"[2] CATF agrees with Earthjustice and other commenters that the Department's comment solicitation wrongly frames the questions "as though encouraging production and use of these products is decidedly a good thing."[3]

In most instances, particularly where purpose-grown crops are used as an energy feedstock, the incremental climate benefits of using bioenergy decrease (or disappear altogether) as

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[1] US Department of Agriculture, Notice of Request for Public Comment on the Executive Order on Tackling the Climate Crisis at Home and Abroad, 86 Fed. Reg. 14403, 14403 (March 16, 2021) ("USDA Agriculture and Climate Comment Solicitation") (https://www.govinfo.gov/content/pkg/FR-2021-03-16/pdf/2021-05287.pdf).

[2] Id. at 14403.

[3] See comments submitted by Earthjustice et al. on USDA Agriculture and Climate Comment Solicitation (April 29, 2021).

bioenergy production increases and the supply of climate-beneficial biomass is exhausted. This inverse relationship between scale and benefits raises three critical climate-related questions that USDA's comment solicitation appears to overlook. First, how much climate-beneficial bioenergy can be produced? Second, what are its best uses? And third, how do we avoid bioenergy systems that exacerbate climate change?

By assuming as a matter of course that an expansion of bioenergy production will provide climate-smart solutions for the agricultural sector, USDA skips over these questions. The way the solicitation is framed implies that the best policy approach is one that maximizes the amount of biomass that is converted into energy, not one that maximizes the climate benefits that can be derived from biomass conversion. The two approaches would lead to very different outcomes, for both liquid biofuels and woody biomass-based power generation.

The federal Renewable Fuel Standard (RFS) unfortunately provides ample evidence of how a policy focused on maximizing liquid biofuels consumption, rather than climate benefits, can negatively impact the environment. Support for the RFS was based in part on an assumption that it would spur the development of climate-beneficial biofuels, but compliance with the program has been achieved predominantly through the production and consumption of corn ethanol, soy biodiesel, and other conventional land-intensive biofuels.[4] The expansion of food-based biofuel production since 2007 has resulted in increased food prices[5] and a wide range of negative environmental outcomes, including declines in water quality[6] and quantity,[7] soil[8] and air[9] quality, ecosystem health,[10] endangered species[11] and other biodiversity, not to mention the loss of carbon-rich grasslands[12] and increased greenhouse gas (GHG) emissions.[13]

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[4] Corn ethanol alone has been used to meet 84% of the total RFS volume obligations from 2007 to 2020.

[5] See, e.g., International Food Policy Research Institute, Biofuels and Food Security: Balancing Needs for Food, Feed, and Fuel (2008) (http://www.ifpri.org/publication/biofuels-and-food-security).

[6] US Environmental Protection Agency (EPA), Biofuels and the Environment: Second Triennial Report to Congress (hereinafter "EPA Second Triennial Report") at 73 (2018) (https://cfpub.epa.gov/si/si_public_file_download.cfm?p_download_id=536328&Lab=IO).

[7] EPA Second Triennial Report at 83.

[8] EPA Second Triennial Report at 97.

[9] EPA Second Triennial Report at 64-65.

[10] EPA Second Triennial Report at 92.

[11] See, e.g., Joint comments from ActionAid USA, et al. on the U.S. Environmental Protection Agency's Proposed Rule - "Renewable Fuel Standard Program: Standards for 2019 and Biomass-Based Diesel Volume for 2020" 83 Federal Register 32024 (July 10, 2018) (EPA–HQ–OAR–2018–0167), at 8-9 (https://www.catf.us/wp-content/uploads/2018/10/CATF_Filing_Biofuels_JointNGOFullComments.pdf).

[12] Lark, et al. 2015. Cropland Expansion Outpaces Agricultural and Biofuel Policies in the United States. Environmental Research Letters 10(4): 1-11. DOI: 10.1088/1748-9326/10/4/044003 (https://iopscience.iop.org/article/10.1088/1748-9326/10/4/044003/pdf).

[13] See, e.g., Lester Lave, et al. 2011. Renewable Fuel Standard: Potential Economic and Environmental Effects of U.S. Biofuel Policy 221 (Report by the National Research Council Committee on Economic and Environmental Impacts of Increasing Biofuels Production) (http://www.nap.edu/openbook.php?record_id=13105).

USDA's blanket assumption that biofuels are climate beneficial may be driven in part by its involvement in two recent lifecycle GHG analyses of corn ethanol—or it may be that the results of those analyses were shaped by USDA's assumption. In any event, the two studies—a 2017 assessment authored by ICF International with support from USDA[14] and a 2019 revision co-written by USDA economists[15]—are beset by methodological and factual problems[16] that severely undermine their contention that the lifecycle GHG emissions level associated with corn ethanol is substantially lower than the level used by the US Environmental Protection Agency.

Efforts like these that attempt to justify continued or expanded use of conventional bioenergy technologies rather than truly low- and zero-carbon energy options will frustrate broader efforts to decarbonize the United States economy. We urge USDA to focus instead on supporting research and development of bioenergy pathways that utilize waste biomass—i.e., biomass that does not require dedicated arable land, is a byproduct from an existing agricultural process, and can be removed from the landscape without disrupting other markets or beneficial ecological functions. CATF is developing a set of principles for developing estimates of available agricultural biomass in the United States that reflect realistic environmental, agronomic and commercial limits, and looks forward to sharing that assessment with USDA when it is completed later in 2021.

Methane Abatement

As an initial matter, before USDA supports any adoption or production of renewable energy technology from livestock management, it is imperative that the Department fully evaluate the climate and environmental impacts of that technology. While anaerobic digesters, by capturing methane and combusting it to create energy, may in a vacuum reduce methane emissions from the industry, they do not manage other pollutants. Moreover, the disadvantaged communities that are already suffering health and welfare impacts from large concentrated animal feeding operations (CAFOs) would not necessarily receive any benefit as the digesters do not reduce the non-methane pollution that causes such impacts and if there are more CAFOs or if CAFOs become larger.

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[14] M.J. Flugge et al., A life-cycle analysis of the greenhouse gas emissions of corn-based ethanol—Report to USDA (2017) (available at: https://core.ac.uk/download/pdf/188109861.pdf).

[15] Jan Lewandrowski et al., The greenhouse gas benefits of corn ethanol—assessing recent evidence, *Biofuels* (2019) (https://www.tandfonline.com/doi/full/10.1080/17597269.2018.1546488).

[16] See Chris Malins/Cerulogy, Navigating the Maize: A critical review of the report 'A Life-Cycle Analysis of the Greenhouse Gas Emissions of Corn-Based Ethanol (July 2017) (https://www.catf.us/wp-content/uploads/2018/10/CATF_Pub_NavigatingTheMaize.pdf); Chris Malins and Stephanie Searle/ICCT, A critique of lifecycle emissions modeling in the greenhouse gas benefits of corn ethanol—assessing recent evidence (September 2019) (https://theicct.org/sites/default/files/publications/Critique_lifecycle_emissions_modeling_20190919.pdf).

Further, the creation of an agricultural methane market could lead to increases in emissions of that GHG. One example would be if subsidies (such as offsets) were available for mitigation approaches that address only a portion of methane from an animal's full lifecycle, and these subsidies exceeded the cost of the mitigation offset (either through market shifts, or by design in order to incentivize wide adoption), they could make it more profitable overall to raise animals, incentivizing farmers to increase the size of their herds. Since the mitigation approach is only addressing some of the emissions from the animal's life cycle, it is possible that the subsidy would actually increase methane emissions. For example, if capturing methane with manure digesters is profitable, farmers may respond by increasing the size of their herds. This would increase emissions from enteric fermentation, since those emissions are not reduced by digesters. It is entirely possible that the increase in emissions from enteric fermentation could be larger than the decrease from manure decomposition.

Therefore, USDA, in conjunction with the US Environmental Protection Agency (EPA) and any other appropriate agencies, should evaluate whether the technologies that seek to produce energy from anaerobic digesters do in fact provide a net benefit for the climate and strive to ensure that there are adequate environmental protections in place to protect communities from increased non-methane livestock emissions.

Agriculture contributes enormous quantities of greenhouse gas pollution, accounting for just under 10% of overall emissions and just under 39% of methane emissions for the U.S.[17] Within the agriculture methane emissions, Livestock Management is the key emitting segment, with Enteric Fermentation being responsible for approximately 70% of agriculture's emissions and Manure Management responsible for 24%.[18] The remainder of this section focuses on the potential for anaerobic digesters to mitigate the GHG emissions from manure management, though as stated above it is imperative that USDA evaluate any energy producing technology from a public and animal health and welfare perspective as well.

There are two general anaerobic digestion technologies:

Traditional: traditional digesters include lagoons, plug flow, and complete mix reactors. These digesters can be mesophilic, operating at ambient or moderate temperatures (25°C – 40°C), or thermophilic heated to 122°F and above.

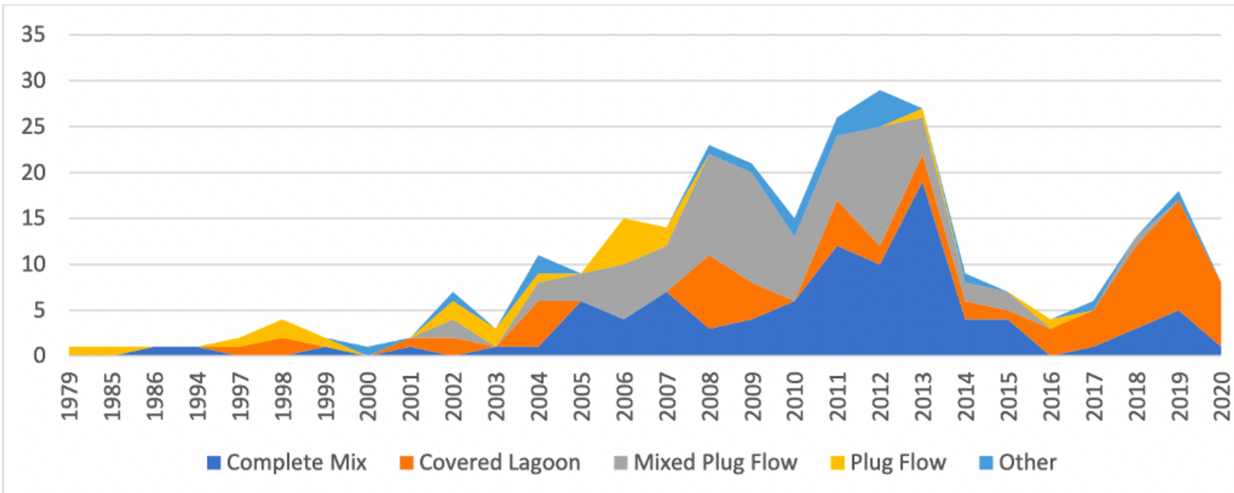
High Rate: high-rate digesters are also thermophilic, but are designed to digest feedstocks at a higher loading rate. This is useful for producers that have

[17] *See* EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2018*, (2020), at 2-19 (available at https://www.epa.gov/sites/production/files/2020-04/documents/us-ghg-inventory-2020-main-text.pdf).
[18] *Id.* at 2-19, Table 2-7 (total agriculture emissions of 253.0 MMT CO_2 eq., with enteric fermentation responsible for 177.6 MMT CO_2 eq. and manure management responsible for 61.7 MMT CO_2 eq.)

a large volume of diluted slurry. However, the increase rate can also lead to clogging problems.

Prior to the turn of the century, plug flow reactors were quite popular. However, from 2003 to 2013, plug flow and mixed plug flow digesters lost market share to complete mix reactors. (Figure 1 below). Recently, the majority of new facilities have been associated with covered lagoons.

Figure 1: Livestock Digester Type [19]



Source: U.S. EPA AgSTAR. Livestock Anaerobic Digester Database

Anaerobic digesters, generally speaking, break manure down into biogas (65% methane and 35% carbon dioxide) and digestate (the remaining solids and liquids).

The biogas rises to the top of the digester where tubes and pipes direct it into a container so it is not released into the air. The most typical use of this biogas is to run an on-farm generator to generate energy onsite. Electric power can also be sold offsite and may receive a premium as renewable or green power. However, the biogas can also be processed to remove carbon dioxide and other non-methane contaminants, odorized and pressurized for injection into an existing natural gas pipeline and sold as renewable natural gas (RNG). When used in a CNG vehicle, this fuel can receive a generous subsidy under EPA's RFS program. (The digestate can be applied to croplands.)

Therefore, anaerobic digester technologies can provide a fuel that can generate energy in different areas of the country. However, before USDA supports widespread adoption of this

[19] *See* Biogas Digestion: Economic and Asset Assessment for Missouri, Report to Missouri Agricultural and Small Business Development Authority Missouri Value added Grant Program (July 2020), at Exhibit 5.4 (available at https://extension.missouri.edu/media/wysiwyg/Extensiondata/Pro/AgBusinessPolicyExtension/Docs/MO-Biogas-Report.pdf).

technology it should support increased research into the local environmental impacts from the producers that would seek to utilize a digester. This includes a close analysis of how or whether these technologies affect other air pollutants that cause adverse impacts to the health and welfare of surrounding communities. USDA must also closely evaluate whether and how anaerobic digesters can impact the pollutants that can enter the local waters. Finally, before widespread adoption, there should also be a close analysis of the impacts of spreading the digestate on land may have on other GHG emissions, including whether it increases the formation of nitrous oxide. All of these questions must be answered before USDA supports anaerobic digesters as a climate-positive technology.

Respectfully submitted,

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