July 14, 2021
California Air Resources Board

Dear California Air Resources Board:

Thank you for accepting these comments submitted by Clean Air Task Force (CATF), the Institute for Governance & Sustainable Development (IGSD), the Climate Reality California State Coalition, and the Environmental Investigation Agency (EIA) on the Analysis of Progress toward Achieving the 2030 Dairy and Livestock Sector Methane Emissions Target. California has been a leader in short-lived climate pollutants (SLCPs) and is viewed as such throughout the world. Because of that, California must maintain its leadership by demonstrating how to effectively reduce SLCPs from the dairy and livestock sector.

California research institutions – especially UC Davis – are recognized globally for the key role they are playing in testing and evaluating additives and other measures to reduce methane from enteric fermentation. In January 2021, Kebreab and Feng from UC Davis completed a CARB-contracted assessment of methane reduction tools in California's agricultural sector: Strategies To Reduce Methane Emissions From Enteric And Lagoon Sources. The authors recommend 3-NOP for use, pending FDA approval, and additional study of a number of other additives. They noted several other additives – including Mootral, macroalgae, and Agolin – that also have potential, but require further studies to determine levels of effectiveness, safety, and adequate sourcing.

There is some optimism that the 2030 dairy and livestock sector targets of a 40% reduction (from 2013) may be feasible. According to CARB's June 2021 draft Analysis of Progress toward Achieving the 2030 Dairy and Livestock Sector Methane Emissions Target, the dairy and livestock sector is projected to achieve just over half of the annual methane emissions reductions necessary to achieve the target by 2030 through modifications to manure management systems – primarily using anaerobic digesters – and additional reductions through assumed 0.5% annual decreases in animal populations. Meeting the 2030 target will require considerably more emissions reductions from additional manure management projects, implementation of enteric mitigation strategies that are not currently approved for market use, or a combination of both over the next few years. Accordingly, CARB recommends a minimum funding amount of at least $100 million but as much as $500 million per year for five years to significantly accelerate manure management methane emissions reduction projects.

Enteric Fermentation

While acknowledging the importance of reduced emissions from enteric fermentation, CARB notes that enteric methane mitigation strategies are not yet commercially available. At the same time, they are optimistic that scientifically proven, cost-effective, safe, and consumer-accepted enteric methane mitigation strategies with long-term effectiveness and resistance to rumen adaptation ***may be*** commercially available within the next three to five years, providing critical additional tools for the sector to meet the 2030 target. This hope is included in a staff assumption toward a statewide adoption rate of a viable feed additive: approximately 14% per year starting at 2024, reaching a 100% by 2030. This is projected to occur without California funding, despite the acknowledgement that "availability of proven strategies is the prime barrier for enteric mitigation strategies."

The June 2021 draft analysis is spot on in describing the state of knowledge and challenges with a number of additives but does not describe mechanisms to overcome the challenges.

SB 1383 requires that only incentive-based mechanisms are authorized for enteric emissions reductions until CARB, in consultation with CDFA, determines that another mechanism is cost-effective, considering the impact on animal productivity and must be scientifically proven to reduce enteric methane emissions, and that adoption of the enteric emissions reduction method would not damage animal health, public health, or consumer acceptance. CARB staff are expected to track potential strategies to reduce enteric methane emissions, analyze their cost effectiveness, and assess the likelihood of consumer acceptance.

This wait-and-see-what-emerges approach is unlikely to be the best and quickest route to Identify effective mitigation mechanisms and ensure that they are developed into commercial products available at the scale needed to substantially reduce statewide enteric methane. The approach not only threatens the ability of the dairy and livestock sector to meet 2030 targets but will make it almost impossible for this sector to contribute as much as possible to achieve net zero by 2035 as part of Governor Newsom's recent directive to CARB to evaluate pathways for the state to achieve carbon neutrality by 2035 (instead of 2045).

Rather than simply tracking these mitigation approaches, CARB and CDFA should commit additional resources, similar to the amount needed for manure management, and establish a publicly-supported program to identify methods to reduce methane from enteric fermentation that are verifiable and do not damage animal and public health or consumer acceptance. CARB and CDFA should work together on key elements of the program. At a minimum, it would cover multiple life stages and should:

- Be conducted over the full life-cycle of the animal.
- Account for any GHG implications of the intervention on a life-cycle basis: changes in milk/meat production, changes in emissions from manure (in storage or after field application), etc.
- Test interventions (and controls) on significant size herds.
- Ideally, studies should be funded by CARB/CDFA/other governments/other third parties, rather than by firms developing potential interventions.
- Ideally, studies should be designed to be as blind (to researchers) as possible.

Such a California program could draw from the leadership of the New Zealand Agricultural Greenhouse Gas Research Centre. New Zealand has invested in research to reduce methane from enteric fermentation for many years, given that ruminants are their largest source of methane emissions, and the country has set significant near-term methane reduction targets: reducing biogenic methane emissions by 24% to 47%, with no new household gas connections by 2025. And from the Department of Agriculture, Food and the Marine in Ireland and the ERA-GAS consortium in the EU, which are supporting development of novel farm-ready technologies to reduce methane emissions from pasture-based agricultural systems, including feed additive (3-NOP, seaweeds, oils, halides) impacts on animal productivity and consumer safety, improved animal health, lifetime performance/age at slaughter (to reduce lifetime methane emissions), and animal breeding (to emit less methane).

At the same time, CARB and CDFA must begin exploring policy designs that will lead to widespread adoption of mitigation approaches, should they prove safe, effective, and not lead to other environmental impacts beyond their ability to reduce methane emissions. Furthermore, mitigation approaches (such as subsidies) must be carefully tailored to avoid detrimental effects such as incentivizing farms to increase herd sizes, which could result from poorly designed subsidy that creates a substantial per-head profit.

Manure Management

To meet 2045 net zero targets, there will need to be methane capture at nearly every one of California's 1,400 dairy farms. This will be challenging, as anaerobic digesters favor large operations. This means that attention and resources also need to be devoted to providing effective technologies on a smaller scale.

The June 2021 draft Analysis of Progress toward Achieving the 2030 Dairy and Livestock Sector Methane Emissions Target recommends a minimum funding amount of at least $100 million per year for five years to significantly accelerate project development by offsetting capital costs and economic risks for manure management methane emissions reduction projects. CDFA and the Senate Bill 1383 Dairy and Livestock Working Group project that as many as 200 digesters may need to be built in order to contribute to the reduction of manure methane by 40% from dairies. This requires an increase between now and 2030 of nearly 160 digesters, up from 41 currently in operation in 2021 (U.S. EPA AgSTAR Livestock Anaerobic Digester Database).

The UC Office of the President funded a $3.89 million, 6-campus study on dairy methane emissions, the first comprehensive, facility-scale inventory of methane emissions (see this overview paper). The CEC is funding a $1m study on dairy digesters with the same researchers to determine pre- and post-digester emissions of methane and other air pollutants. These results and additional efforts should be incorporated into the June 2021 draft analysis.

CARB's goals regarding manure management must be focused on methane reductions and reducing air pollution and other impacts on local communities particularly from large dairy operations. Methane recovered from digesters is a valuable source of energy, but harnessing this energy is secondary to preventing methane emissions. So-called renewable natural gas (RNG), in which agricultural methane is upgraded for injection into existing gas pipeline systems, is just one option for utilization of agricultural methane, the other option is electricity generation (for either on-site use or with a grid connection). There simply is not sufficient methane from manure management to replace a significant portion of the fossil natural gas used in California. We do not support subsidizing infrastructure to upgrade gas from digesters and transport that gas to pipeline systems. Among other problems, such schemes are likely to be expensive and inefficient, relative to electrification, as a means to reduce consumption of fossil natural gas. Additionally, these schemes raise significant concerns about creating a market (which would seek similar subsidies) for methane from gasifiers using woody biomass as an input.

CARB's primary policy goal should be to minimize methane emissions, not on getting biomass-derived methane into the pipeline system. Accordingly, CARB and CDFA should work with operators of digesters to find schemes for utilizing methane from digesters for useful energy (such as providing heat or generating electricity) that are consistent with the CARB's mandate to protect and improve air quality. The policy mechanism should consider lifecycle emissions of RNG, including emissions associated with upgrading biogas and methane leakage from gas distribution system. And, the policy mechanism should consider the energy sources displaced by the utilized methane, i.e., RNG displaces fossil gas in pipelines, and the displacement by additional electricity generation depends on facility.

The California Methane Survey found four dairy digesters (of 25 surveyed) with large, persistent methane leaks of 50-500 kg/hr in 2016 and 2017. The 2022 Scoping Plan and June 2021 draft analysis should address what enforcement activities and other leak detection safeguards CARB and CDFA have in place to determine whether the diary digesters are capturing methane as intended.

As with enteric methane, CARB and CDFA should also explore policy designs for digesters that efficiently reduce methane emissions without significantly subsidizing large, profitable animal operations, especially in ways that place them at a competitive advantage over smaller operations.

Half the projected 2030 reductions (26% of the target for this sector) are due to assumed herd reductions (0.5% per year). USDA reports a 2% increase in the number of milk cows in the U.S. from 2011 to 2020, and a corresponding 14% increase in milk production, which seems at odds with the assumed 0.5% annual decline in California unless the dairy cows and their associated methane emissions are being moved to another state lacking a comprehensive methane mitigation program. Under the same principle where CARB allows methane offsets to be generated with projects in other states because methane is a global climate pollutant, CARB and CDFA should consider partnering with USDA and other states on methane mitigation if decreased animal populations in California result in increases elsewhere.

The Aliso Canyon methane leak resulted in 109,000 MT (2.725 $MMTCO_2e$) of excess methane emissions that need to be mitigated by the Southern California Gas Company. CARB recommended that the mitigation program focus primarily on reducing methane emissions from the agriculture (including dairy) and waste (landfill and wastewater) sectors. While we realize that the methane mitigation needs to be additional to, and not part of, meeting the state's SB 1383 methane reduction goal, the last publicly available progress report (2nd quarter of 2020) indicates no progress. What is the status of meeting these reductions, especially on manure management?

We greatly appreciate the opportunity to comment on this important proposal and thank CARB for its leadership on these key climate and public health issues.

Respectfully submitted,

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