



December 15, 2022

Ms. Cheryl Laskowski,  
Branch Chief, Low Carbon Fuel Standard Team  
California Air Resources Board

**RE: Comments on “Potential Changes to the Low Carbon Fuel Standard”**

Dear Ms. Laskowski:

Thank you for the opportunity to provide comments to the California Air Resources Board (CARB) on your “Potential Changes to the Low Carbon Fuel Standard,” as presented by Staff at the November 9, 2022, Public Workshop.

Maas Energy Works Inc (Maas) is North America’s largest developer of dairy digester projects and one of the two largest digester companies active in California. These projects generate renewable natural gas (RNG) and electricity, purposed for use as vehicle fuel. In the dairy industry, Maas purposes to develop projects that support CARB’s long-term goal of greenhouse gas (GHG) emission reductions, protect local air and water quality, create local jobs, and provide a new revenue stream along with other meaningful benefits to the dairy.

The Low Carbon Fuel Standard (LCFS) program is the nation’s leading and most successful example of a market-based carbon reduction regulation for the transportation sector, so much so that other states and nations have begun modeling their own LCFS programs after California’s. The program has been instrumental in supporting the growth of a broad portfolio of low carbon transportation fuels in California, their associated reductions in carbon and pollutant emissions, job growth in clean energy sectors, and other benefits.

Not only has the LCFS over-performed in lowering the carbon intensity of the state’s transportation fuels, but the LCFS has also enabled substantial growth in dairy digester investment in California and the nation. Our industry has succeeded in deploying numerous new systems, technologies, and business models to help meet the state’s methane reduction goals. The system is working. California dairy digesters are a major low carbon, renewable energy success story in an area that was unproven 10 years ago. To address implications of CARB’s proposed program edits in their latest LCFS Workshop, some of which have the potential to upset the success of dairy digesters to date, Maas respectfully submits the following comments:

### U.S. Highlights

**Projects - 331**

operational projects in the United States (May 2022)

- ▶ 279 Dairy
- ▶ 45 Hog
- ▶ 8 Poultry
- ▶ 8 Beef

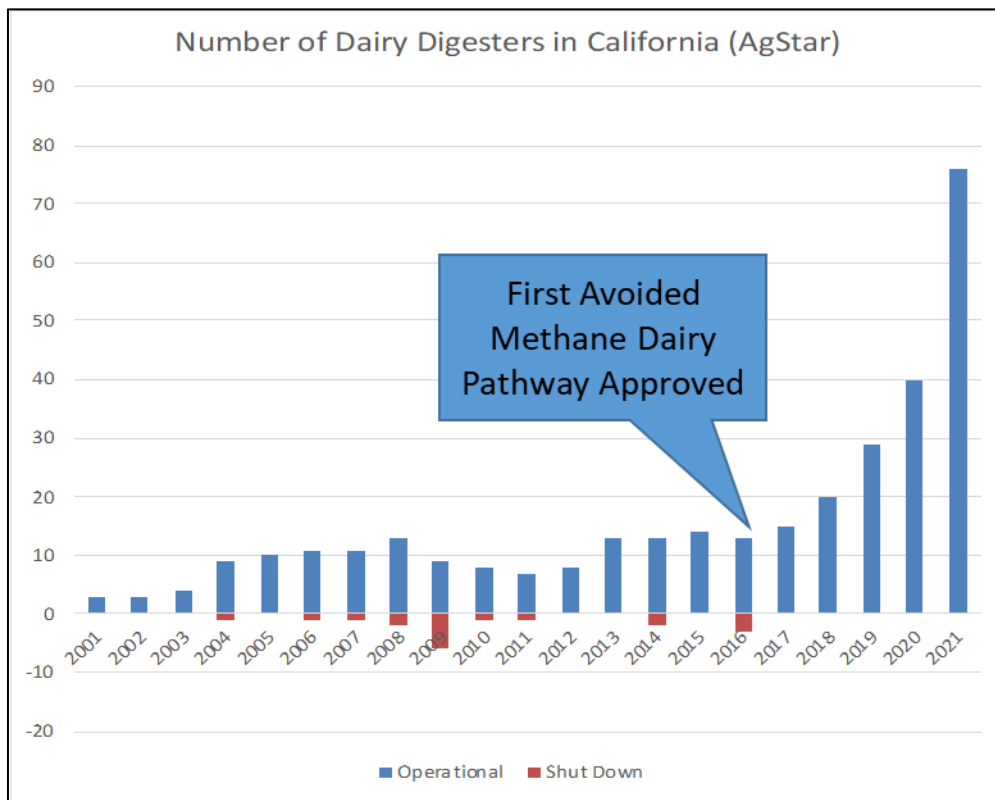
*Note: Total exceeds 331 because some systems accept manure from more than one animal type.*

## Avoided Methane Benefit

### *Avoided Methane Benefit Impact to Dairy Digester Growth and Consequential GHG Emission Reduction*

California's state leadership has been attempting to build a dairy digester industry since at least 2002. Multiple rounds of public funding supported digester construction in the early 2000s via the Dairy Power Production Program and other efforts. Yet despite significant state investment, the total number of deployed systems remained static for 15 years (see EPA Agstar chart below). The reason for this failure was that there was no revenue model to support ongoing digester operations at a price level that would justify the operating costs. Digesters are small-scale sources of RNG, and as such have high operating costs. Without a premium value on digester gas, each year nearly as many digesters shut down as started up. Furthermore, when grant funding was not available, few if any investors would fund new digesters.

The situation changed in 2016, when CARB certified the first LCFS pathway validating the avoided methane emissions attributable to dairy digesters. In the years since, not one California dairy digester has shut down. Rather, old digesters have been refurbished or restarted, and new digesters are coming online at a rapid rate. The reason: dairy biogas now has a premium price attached to it. Farmers, investors, developers, and operators now have an incentive to build these projects, improve technologies, and sustain operations to capture revenues from carbon-negative dairy RNG.



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We appreciate CARB's November 2022 workshop proposal that new dairy digester projects would be guaranteed 10 years of eligibility for avoided methane benefits if online before 2030. The language of CARB's proposal made it sound as though digester projects would get only 10 years of avoided methane crediting, and no more. However, digesters are long-term infrastructure projects that take years to build and many more years to recover their investments. In the grand scheme of project investment, 10 years is not very long. With current LCFS market pricing, the average payback time for investment in a dairy digester project (without grant funding) is 10-12 years. Constant improvement in CI is accomplished by adding more

efficiency, expanding project capabilities. These investments, let alone an investment in initially commissioning a digester, make less sense if the industry has only a few years of avoided methane benefit left. A sunset of avoided methane would put an immediate end date on the value of any investment in dairy RNG. Digesters we build last year would have only 8-9 years left and would not warrant new investments in capacity, efficiency, or longevity. In the absence of a new market providing comparative returns, many digesters will shut down—digesters that CARB is counting on to meet the Scoping Plan post 2030 methane reduction targets (see image below). More importantly, new digesters would need to pay off their investment and still generate a profitable, risk-adjusted return, all in 10 years.

Candidly, dairy digesters are not the most capital efficient way to make RNG. Landfills and Wastewater Treatment plants can make carbon-positive RNG at a much larger scale and therefore much more efficiently. See image below from market research firm Enverus, showing that operating costs at a dairy RNG side are twice that of a landfill, and 36 times that of a natural gas facility. Capital efficiency ratios are similar. The only reason California has a dairy digester industry is because the avoided methane benefit of livestock manure overcomes the small scale of the projects. And if CARB wants to continue incentivizing new investment on more, smaller California dairies, this avoided methane benefit needs to remain.

**FIGURE 10 |** Transport RNG and Marcellus Sample Economic Comparison

	Manure Gas	Landfill Gas	Five-Well Marcellus Pad
<b>PRODUCTION</b>			
First Year Production (Mcf/d)	550	2,400	53,788
30-Year EUR (Bcf)	6	26	97
CARB Carbon Intensity (g CO <sub>2</sub> e/MJ)	(400.0)	50	83
30-Year Emissions (Million Mt CO <sub>2</sub> e)	(2.5)	1.4	8.5
<b>ECONOMICS</b>			
Capex (\$MM)	\$36.30	\$35.07	\$34.80
Capital Efficiency (\$/Mcf/d)	\$66,000	\$14,612	\$647
Total Gross Opex (\$/Mcf)	(\$30.0)	(\$15.0)	(\$0.8)
D3 RIN Granted (#/MMbtu)	11.727	11.727	0
D3 Price (\$/Credit)	\$3.00	\$3.00	NA
LCFS Granted (#/MMbtu)	0.46	0.03	0
LCFS Price (\$/Credit)	\$125	\$125	NA
Flat HH Price (\$/Mcf)	\$4.00	\$4.00	\$4.00

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We recommend that CARB set no firm end date on avoided methane crediting. Rather, avoided methane should be credited following existing LCFS regulation that the reductions must be additional and voluntary. The LCFS avoided methane benefit is precisely what would encourage projects to implement voluntary projects with private capital. When binding regulations exist that mandate methane reduction, only then should the avoided methane credit expire at the end of the applicable crediting period.

### Book-and-Claim Accounting

Non-Western states will most likely not have fully developed LCFS programs implemented within 10 years' time. For this reason, it is difficult to understand the benefit of CARB's November 2022 suggestion to phase out book-and-claim accounting within California's LCFS. We believe book-and-claim is working well and is well-suited to both the digester industry and natural gas grid. Our company is primarily based in California, but we are expanding to numerous other states. Without book-and-claim, these investments suddenly

become questionable, without doing anything significant to help the rate at which we can build more of our California digesters.

*Role of Importation*

According to the Argonne National Laboratory, the state of California has increased its in-state RNG production capabilities. This in-state production supplies 23% of California’s total demand of RNG used in its CNG and LNG vehicles. Although internal supply of 23% is an impressive feat to be celebrated, the state is simply not prepared to internally supply its remaining 77% of CNG demand alone. Allowing external supply of RNG provides diversification, allowing Californians access to a variety of supply options at lower costs.

<u>California RNG Supply<sup>1</sup></u>	<u>GGE/Year</u>
Food Waste	8,268,191
Landfills	1,789,000
Livestock	33,109,360
Wastewater	4,984,088
<i>Total</i>	<i>48,150,639</i>
<u>2021 CA Demand for CNG/LNG<sup>2</sup></u>	<i>210,971,712</i>
<b>% of CA Demand Served by In-state Supply</b>	<b>23%</b>

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The LCFS Workshop mentioned an intent to support the long-term Scoping Plan policy for use of biomethane for hydrogen. By 2030, the IEA estimates a total hydrogen demand of 180 Metric tons per year. If and when this market becomes available, California will need more, not less, RNG to fulfill its needs. But developers will not start and stop production of RNG projects for the California market if there remains an ever-present risk that the LCFS program may exclude certain states.

Furthermore, CARB has expressed an intent to align accounting and deliverability requirements for natural gas and low-CI electricity. The two networks should not be logistically aligned as physical deliverability is handled much differently in the natural gas system versus the electrical system, as other commentators have described. Our company routinely moves both power and natural gas between states to different markets. Power is very difficult to move over long distances. Gas is not. As a result, there are very few dairy digesters that deliver power interstate. The LCFS program should not intentionally make it more difficult to move one low-carbon commodity, simply because another is also difficult.

**Tools to Increase California Digester Deployment**

We firmly believe that the existing incentive structure for dairy digesters is working, and thus the best thing CARB can do is not upset it. CARB’s first goal should be to maintain an LCFS revenue incentive for farmers and investors to capture methane emissions. If this signal is clear and predictable that avoided methane has a market value, our industry will continue to deploy digesters.

However, CARB has asked for additional ideas to increase dairy methane reduction projects. We have at least two ideas: two within the LCFS and one outside of it.

*One-Time True Up*

First, we suggest that the LCFS program provide a one-time true up. Currently, new digesters are waiting approximately two years between startup and provisional certification of their LCFS pathways. Since RNG

can only be stored for 3 quarters, every dairy project is forced to dispense gas at the -150 temporary score and thus give up significant LCFS credits during this startup period. Once CARB has certified the project's true CI score, the project should be allowed a one-time issuance of additional credits for the difference between the -150 generation and the CI score as certified by CARB. This benefit is important to ensuring the carbon-negative projects secure the value of their RNG and de-risk investment in the critical first years.

### *Increase Carbon Reduction Targets*

We recommend that CARB raise its current 20% carbon reduction target to 35%, which is still less than Oregon's newly published target. The industry has found ways to achieve substantial carbon reductions, and a more aggressive target will send a signal that low carbon fuels are still a good investment. We also recommend CARB implement some mechanism to retire the excessive bank of credits that currently exists. This kind of market driven signal will help us and others to build the next generation of dairy digesters on successively smaller California farms. Absent of such a change, the LCFS risks being a victim of its own success and an object lesson to companies not to be overly enthusiastic in responding to a government incentive program.

### *Water Board Filling Timeline*

California has the most stringent water quality protections in the country for new manure ponds. A significant project hold-up for digester developers in California is the requirement to wait until the California State Water Resources Control Board (Water Board) has approved the Post Construction Report (PCR) of a new, double-lined pond. That is, even after a digester project has constructed a new, double-lined pond pre the Water Board's approved design and conducted extensive testing, digesters cannot fill the pond with manure. Rather, the digester project must submit a PCR to the Water Board and then wait for an affirmative response before filling. The Water Board nearly always approves the pond for filling with no changes, so this additional step does not add any value in water quality protection. In fact, most of the time our new digester ponds are replacing older, unlined ponds that are less protective. But instead of using the new, double-lined pond, the new ponds sits empty for months and manure continues to emit methane in other, uncovered ponds. The PCR approval process can take anywhere from 2.5 to 8 months (usually 4-6 months). The delay creates unnecessary costs, adds uncertainty, delays revenue, frustrates dairy producers, and misses an opportunity to capture methane emissions.

We suggest that dairy digesters be allowed to fill and cover a digester pond prior to receiving the Water Board's PCR approval. This pre-PCR filling would be at-risk, meaning that the digester owner would be responsible for draining and/or modifying the pond if the Water Board later determined it was necessary. To be allowed to fill the pond the digester would need to receive a certification from a Professional Engineer licensed in California that the pond had completed inspections, including spark testing for leaks, liner quality inspections, a freshwater leak test, and an additional geotechnical summary. With this application complete and submitted to the Water Board, the digester project would be allowed to proceed to fill at-risk, thus bringing forward nearly every digester in the state by 4-6 months.

### **Conclusion**

Those of us in the California dairy digester industry have worked hard since 2016 to transition our industry from one that generates power to one that generates pipeline RNG. Along the way, we left the security of long-term utility power contracts and instead, entered a market where our revenues are almost entirely dependent upon regulated market pricing and policies. A market awash in supply and the possibility of losing our avoided methane benefits are both major warning signs to us. In order to continue investing capital and the careers of our 110 California-based employees into this market, we request that CARB send a strong and consistent signal that California transportation markets place a premium value on low-carbon

fuels (including their avoided methane benefits).

Maas is thankful for the opportunity CARB presents to comment on proposed LCFS regulation.

Sources:

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