# Comment 1 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Kim
Last Name: Hagemann
Email Address: kimhagemann@msn.com
Affiliation: none

Subject: LCFS: Why are they available to farms in Iowa?
Comment:

LCFS: Why are they available to farms in Iowa when the purpose of CARB is to reduce the methane in California?

Last year, HF522 was passed in the Iowa legislature, and it allows Concentrated Animal Feeding Operations to expand and add even more livestock to their operations if they build a methane digester. Nine Iowa dairies have already received digester permits since new law, and seven plan expansion. One of these dairies has already had a large manure spill.
Even when contained and used for methane, the remaining liquid manure still has no place to go than be spread, beyond capacity and often frozen, then migrates into Iowa's waterways.
Lowering pollution could be achieved with lower livestock concentration and pasturing livestock; Iowa has a landscape much more similar to northern California than to the San Joaquin Valley.

But California's Low Carbon Fuel Credits (LCFS) are making it harder for Iowa to get to a real solution because it is incentivizing digestors.
Iowa waterways have been becoming more dangerous every year. More episodes of blue green algae blooms are occurring and children have been sickened and dogs have died due the unhealthy conditions of our lakes.
The Des Moines water system was nearly unable to provide adequate amounts of drinkable water last year due to the microcystin toxin in the water supply. Des Moines also houses the largest nitrate removal system due to the agricultural pollution in our waterways. Iowa has enough trouble fighting against the agriculture industry so that we can have safe recreational water areas and a safe drinking supply. Please understand that your actions are making it harder to live in Iowa. Please do not pursue these types of LCFS, because we are fighting for our lives. Please, do not make the fight harder.

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2022-03-30 10:07:48

No Duplicates.

# Comment 2 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Kim
Last Name: Hagemann
Email Address: kimhagemann@msn.com
Affiliation: none

Subject: LCFS: Why are they available to farms in Iowa?
Comment:

LCFS: Why are they available to farms in Iowa when the purpose of CARB is to reduce the methane in California?

Last year, HF522 was passed in the Iowa legislature, and it allows Concentrated Animal Feeding Operations to expand and add even more livestock to their operations if they build a methane digester. Nine Iowa dairies have already received digester permits since new law, and seven plan expansion. One of these dairies has already had a large manure spill.
Even when contained and used for methane, the remaining liquid manure still has no place to go than be spread, beyond capacity and often frozen, then migrates into Iowa's waterways.
Lowering pollution could be achieved with lower livestock concentration and pasturing livestock; Iowa has a landscape much more similar to northern California than to the San Joaquin Valley.

But California's Low Carbon Fuel Credits (LCFS) are making it harder for Iowa to get to a real solution because it is incentivizing digestors.
Iowa waterways have been becoming more dangerous every year. More episodes of blue green algae blooms are occurring and children have been sickened and dogs have died due the unhealthy conditions of our lakes.
The Des Moines water system was nearly unable to provide adequate amounts of drinkable water last year due to the microcystin toxin in the water supply. Des Moines also houses the largest nitrate removal system due to the agricultural pollution in our waterways. Iowa has enough trouble fighting against the agriculture industry so that we can have safe recreational water areas and a safe drinking supply. Please understand that your actions are making it harder to live in Iowa. Please do not pursue these types of LCFS, because we are fighting for our lives. Please, do not make the fight harder.

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2022-03-30 10:07:48

No Duplicates.

# Comment 3 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Jonathan
Last Name: Kennedy
Email Address: kazakhs@sbcglobal.net
Affiliation: California citizen

Subject: Methane Reductions
Comment:

I live in the San Joaquin Valley of California and have been here for over 30 years and my whole life in California. I like the progress that is being made to reduce emissions by capturing methane and replacing diesel and gasoline as a transportation fuel. The LCFS credits structure has been a valuable tool to incentivize investment to build methane digesters not only in California, but accross the United States. My concern is that the projects are so successful that they are starting to generate significant LCFS credits now that the projects are starting to produce gas and gettting their pathways in place. Reviewing the statistics on your website, the fossil natural gas has been displaced by landfill gas and the livestock gas over time. Based upon the credit values, the trend will continue with the landfill gas to be displaced by the livestock gas going forward which will create more credits for the same level of diesel gallon equivalents being used. We will see some organic growth as vehicles are converted to RNG from diesel in terms of the overall percentage. The result is that between credits generated from renewable diesel and the livestock gas coming onboard with much from out of state, the number of credits are exceeding the deficits and LCFS credit prices are falling from over $200 to less than $120 over the past few months. Much of the gas is from outside the state of California which do nothing towards reaching our goal to reduce methane emissions by 40% by 2030 in California. These lower credit values may lead to less investment to cover capital costs and operating costs which may ultimately cause failure to meet the methane reductions requirements. The question for you is how do we increase the conversion to to RNG from diesel and at the same time keep the incentive in place to capture livestock methane emissions with digester projects to continue to work towards that while not flooding the market of LCFS credits from landfill and livestock gas as well as other renewables coming in from outside of California. They are getting the economic benefit from the credits, but not contributing towards better air quality in California. I pay a premium in fuel prices to support these programs, but would also like them to benefit my air basin with better air quality rather than my funds going to out of state producers. The export of credit values to RNG suppiers outside of California from people like me paying higher prices at the pump doesn't seem equitable. I could see the 1% RNG changing suppliers with over all carbon intensity being reduced buy maybe not reducing methane and possibly no change in tailpipe emissions unless we mandate higher convertion to CNG vehicles from diesel/gasoline.
Thanks for your time and efforts.
Jonathan

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2022-03-31 14:33:36

No Duplicates.

## Comment 4 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Brenda
Last Name: Brink
Email Address: brendarbrink@gmail.com
Affiliation:

Subject: Low Carbon Fuel Standard
Comment:

```
Attached is my comment as given at the recent workshop on manure
digesters.
```

Attachment: www.arb.ca.gov/lists/com-attach/4-dairywkshp220329-ws-UTJSNVMgUGFXDlc0.odt

Original File Name: CARB comment.odt

Date and Time Comment Was Submitted: 2022-04-01 10:49:37

No Duplicates.

# Comment 5 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Linda
Last Name: Fitzgerald
Email Address: lmf50614@hotmail.com
Affiliation:

Subject: Don't give carbon credits to Iowa manure greenwashing
Comment:

My home state of Iowa has become a sacrifice zone every bit as devastating, spread over the whole state, as the Gulf communities and 3rd World countries we pity. Our water, our soil, our air -- and even our politics -- are all polluted by unregulated animal production and the commodity crops that feed them. A nutrient reduction strategy has failed to stem, much less reduce nutrient loss, given that it is carefully controlled to prevent any economic discomfort to the industrial agriculture that creates most of the nutrient pollution in our waterways -- all the way to the dead zone in the Gulf and red tides in W. Florida. The chief polluters are eager to push a biofuel agenda and now have jumped on biogas and its carbon pipeline system as a way to justify massive expansion of their "no consequences" extractive business model. The few remaining family farmers are valiantly fighting back as politicians give their funders eminent domain to disrupt small scale free range cattle production and responsibly scaled crops as the pipeline owners force their dangerous carbon capture pipes across the state, crossing multiple waterways in the Mississippi and Missouri watersheds. What is in it for them? Your generous carbon credits. Please do not feed this monster that is destroying one of the formerly richest soil and water systems in the world.

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2022-04-02 07:02:52

No Duplicates.

# Comment 6 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Ann
Last Name: Zerkel
Email Address: annzerkel@gmail.com
Affiliation: none

Subject: Pollution from Factory Farms
Comment:

DO NOT PAY POLLUTERS TO SOLVE THE PROBLEMS THEY HAVE CAUSED!

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2022-04-02 07:30:10

No Duplicates.

# Comment 7 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Bryn
Last Name: Pangburn
Email Address: northstarbryn@gmail.com
Affiliation: Family Farmer

Subject: Factory Farming
Comment:

To whom it may concern,
  Out of deep concern and frustration I am writing to California CARB to inform you that Iowa does not need a private out of state company profiting off of greenwashing schemes in Iowa. I am a life long resident of Iowa. I have had to witness the destruction of this state caused by the Corporate Ag industry. Beautiful Iowa has become a cesspool of manure caused by absentee billionaires. Billionaires aren't the only human beings that matter in this Country. The political power you have amassed has been devastating to everything and everyone in its path. You don't have a right to contaminate the water and soil of Iowans. Who do you think you are. The repercussions will affect your children and grandchildren too no matter where you live. You should of left the farming to real farmers. But of course the greed in America's wealthy class has been limitless in its appetite. God doesn't love you more and neither do true Americans. Stop the lies, we see through it. Stop the hypocrisy it's pathetic. Stop killing people animals and the planet. Keep your bad faith pledges in California.
Life long family farmer of Iowa, Bryn Pangburn

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2022-04-02 09:00:39

No Duplicates.

# Comment 8 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Hurd
Last Name: Hess
Email Address: hurdhess43@hotmail.com
Affiliation:

Subject: dairywkshp220329-ws
Comment:

```
No to anything that allows polluters receiving payment of any kind
for the pollution they created. This Tax payer gets very angry when
learning some regulatory agency even considers asinine proposals as
this.

Polluters create...they should wallow in their own creation.
```

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2022-04-02 09:59:35

No Duplicates.

# Comment 9 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Charlene
Last Name: Ferguson
Email Address: caferguson@lvcta.com
Affiliation:

Subject: Dirty Iowa
Comment:

```
Please do not do anything to encourage more dirty factory farms in
Iowa.  Iowa is not regulating the environment as it should.
Factory farms need to be discouraged!!!
```

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2022-04-02 10:55:43

No Duplicates.

# Comment 10 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Arie
Last Name: Sirotiak
Email Address: amsiro@iastate.edu
Affiliation:

Subject: Don't allow factory farms to to claim LCFS credits for trapping their own methane
Comment:

Hi,

I am a resident of Iowa, where I have lived all my life, and I am writing to urge that you please do not give Low Carbon Fuel Standard credits to factory farms for building digesters to trap methane gas from the enormous amount of manure they produce. As I understand, this is being viewed as helping to address climate change, but while the problems with this idea might not be so obvious to those out of state, I am telling you that it actually worsens threats to Iowa's water crisis and encourages the expansion of factory farms, which have had serious negative effects on our environment and health. You should realize that Iowa's regulation of factory farms is currently very lax, and a state law passed last year will allow Iowa factory farms to expand their herd sizes--which already exist in deeply unhealthy concentrations--when they build a methane digester. A methane digester in Lyon County Iowa owned by biogas company Gevo recently spilled 376,414 gallons of liquid manure into surrounding waterways at Winding Meadows Dairy. Please do not allow private, out-of-state companies to profit while adding to the damage factory farms have already caused to Iowa's waterways and Iowans' health.

Thank you,

Arie Sirotiak

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2022-04-02 12:06:57

No Duplicates.

# Comment 11 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Virginia
Last Name: Swift
Email Address: ginswift@mchsi.com
Affiliation:

Subject: Low Carbon Fuel Standard (LCFS) credit system’s impact on Iowa
Comment:

California's proposal will only drive factory farm expansion in Iowa, create even more pollution, and do nothing to address the climate crisis.

California needs to know that we do not want dirty money or dirty energy in our state of Iowa. Unfortunately, Iowa fails to regulate factory farms, and a state law passed last year will allow Iowa factory farms to expand their herd sizes when they build a methane digester.

California needs to know that we don't think private, out-of-state companies should be allowed to profit off greenwashing schemes that will worsen Iowa's water crisis and further incentivize factory farm expansion.

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2022-04-02 12:43:25

No Duplicates.

# Comment 12 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Timothy
Last Name: Kautza
Email Address: kautza@netins.net
Affiliation:

Subject: Low Carbon Fuel Credits
Comment:

I write to express my concerns about California's Low Carbon Fuel Standard (LCFS) credit system and its impact on Iowa. I don't think large scale confined animal operations should be able to claim LCFS credits when they build digesters that trap methane gas from the massive amounts of manure that they produce. Why are polluters being paid to solve the problem they caused in the first place?

I do not want dirty money or dirty energy in our state. Iowa fails to regulate factory farms and, actually, our State passed a law last year that will allow Iowa factory farms to expand their herd sizes when they build a methane digester.

I think California's proposal would only increase factory farm expansion in Iowa, create even more pollution, and do nothing to address the climate crisis.

Private, companies from outside Iowa should not be allowed to profit off greenwashing schemes that will worsen Iowa's water crisis and further incentivize factory farm expansion. Why make the factory farm industry even more profitable and fuel the fossil fuel industry with false promises of "greener" greenhouse gasses?

The dairy industry is trying to sell methane digesters as a climate solution, but all digesters really do is trap gas to sell to California and leave manure for Iowa to deal with.
Agribusiness corporations want to sell methane as a product and claim Low Carbon Fuel Credits (LCFS), a monetary credit that is awarded by the amount of carbon "sequestered" (taken out of the atmosphere), from California. They are not solving the problem they've created; they're making it worse--and profiting off it!
Please do not implement the proposed Low Carbon Fuel Standard credit system.

Thank you!

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2022-04-02 12:52:28

No Duplicates.

# Comment 13 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Bruce
Last Name: Morrison
Email Address: info@morrisons-studio.com
Affiliation:

Subject: Public Comments on Workshop on Methane, Dairies and Livestock, and Renewable Natural Gas i
Comment:

```
We in our state (Iowa) don't think private, out-of-state companies
should be allowed to profit off greenwashing schemes that will
worsen Iowa's water crisis and further incentivize factory farm
expansion.

California - we do not want dirty money or dirty energy in our
state. Iowa fails to regulate factory farms, and that a state law
passed last year allows Iowa factory farms to expand their herd
sizes when they build a methane digester.  Spillage from these is
now all too common - we should not have to pay polluters for the
pollution they cause.
```

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2022-04-02 15:59:10

No Duplicates.

# Comment 14 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Anne
Last Name: Tews
Email Address: amtews@gmail.com
Affiliation: Iowa CCI

Subject: manure and factory farms
Comment:

Hello-
Please do NOT bring your factory farms and manure processing to Iowa. We've got too many of the darn things here already!!! We do NOT need more corporations adding their manure pollution to the mix. The State needs to get the manure pollution under control so our water is not irreversibly destroyed. The stench of these places drive people away from rural Iowa, our economies can't afford that on top of the rest.
Due to the lack of snow fall, etc. in California the drought and fire risks will be worse this year. Do not ruin our water and environment because things are bad in California. We need to limit damage due to pollution and climate change.

Thank you.
Anne

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2022-04-02 17:14:38

No Duplicates.

**Comment 15 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.**

First Name: John
Last Name: Ikerd
Email Address: jeikerd@gmail.com
Affiliation: University of Missouri-Columbia

Subject: Economic and Social Impacts of California's Low Carbon Fuel Standard
Comment:

See attached file for statement.

Attachment: www.arb.ca.gov/lists/com-attach/15-dairywkshp220329-ws-UDNUM1QnU2JWDwdw.pdf

Original File Name: CARB Workshop March 29 Statement- John Ikerd.pdf

Date and Time Comment Was Submitted: 2022-04-03 09:09:54

No Duplicates.

# Comment 16 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: John
Last Name: Ikerd
Email Address: jeikerd@gmail.com
Affiliation: University of Missouri-Columbia

Subject: Economic and Social Impacts of California’s Low Carbon Fuel Standard
Comment:

```
Correction of typo in previous statement in attached file. Estimate
of total subsidies for anaerobic digesters is $2,000 per cow rather
than $1,000 per cow. John Ikerd
```

Attachment: www.arb.ca.gov/lists/com-attach/16-dairywkshp220329-ws-AWJUM1QnAjNQCVcg.pdf

Original File Name: CARB Workshop March 29 Statement- John Ikerd.pdf

Date and Time Comment Was Submitted: 2022-04-03 11:37:37

No Duplicates.

# Comment 17 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Michael
Last Name: Madden
Email Address: myke907@gmail.com
Affiliation:

Subject: Water crisis
Comment:

```
We don't think private, out-of-state companies should be allowed to
profit off greenwashing schemes that will worsen Iowa's water
crisis and further incentivize factory farm expansion.
```

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2022-04-03 16:25:19

No Duplicates.

# Comment 18 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Theresa
Last Name: Johnson
Email Address: robintracy1@yahoo.com
Affiliation:

Subject: Iowans won't benefit from the Manure Gold Rush
Comment:

Methane Digesters are nothing but a Greenwashing scheme. Factory farms need to be dismantled and outlawed, not encouraged to become bigger by the law passed by the Iowa legislature last year, HF522. HF522 allows factory farms to increase their herd size if they install a methane digester, but while the methane travels to California, the manure STAYS IN IOWA, polluting our land, air, and water. The water, of course, doesn't stay in Iowa--it travels into the Mississippi River and into the Gulf of Mexico, where it creates huge dead zones.

Let's face facts. There is nothing "renewable" about methane gas from factory farms.

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2022-04-03 22:43:33

No Duplicates.

# Comment 19 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Jeremy
Last Name: Martin
Email Address: jmartin@ucsusa.org
Affiliation: Union of Concerned Scientists

Subject: Dairy methane credit aggregator proposal
Comment:

```
Please see attached proposal.
```

Attachment: www.arb.ca.gov/lists/com-attach/19-dairywkshp220329-ws-VCFXMlQmWVVWNFQ1.pdf

Original File Name: UCS Dairy methane credit aggregator proposal.pdf

Date and Time Comment Was Submitted: 2022-04-08 14:12:31

No Duplicates.

# Comment 20 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Brandon
Last Name: Butler
Email Address: bbutler@roesleinae.com
Affiliation: Roeslein Alternative Energy

Subject: Roeslein Alternative Energy
Comment:

```
Please find the attached documentation from Roeslein Alternative
Energy.
```

Attachment: www.arb.ca.gov/lists/com-attach/21-dairywkshp220329-ws-BnRdOlYyBzkAWQBm.docx

Original File Name: RAEM Facilities Fact Sheet.docx

Date and Time Comment Was Submitted: 2022-04-11 12:06:41

No Duplicates.

**Comment 21 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.**

First Name: Silvia
Last Name: Secchi
Email Address: silvia-secchi@uiowa.edu
Affiliation:

Subject: Comments on the effect of CARB's policy on Iowa CAFOs
Comment:

Attachment: www.arb.ca.gov/lists/com-attach/22-dairywkshp220329-ws-AHNSMQFjAjIGaAhh.docx

Original File Name: Secchi comments 3 29 workshop final.docx

Date and Time Comment Was Submitted: 2022-04-11 17:17:23

No Duplicates.

# Comment 22 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Ryan
Last Name: Kenny
Email Address: ryan.kenny@cleanenergyfuels.com
Affiliation: Clean  Energy

Subject: Comments from Clean Energy
Comment:

```
Thank you for considering the attached comments from Clean Energy.
```

Attachment: www.arb.ca.gov/lists/com-attach/23-dairywkshp220329-ws-AmFcNl0yV2ELUgJh.pdf

Original File Name: CLNE Comments CARB Methane Workshop.pdf

Date and Time Comment Was Submitted: 2022-04-11 22:56:11

No Duplicates.

## Comment 23 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Sherrie
Last Name: Merrow
Email Address: smerrow@ngvamerica.org
Affiliation: NGVAmerica

Subject: Comments in support of Methane from Animal Waste in LCFS
Comment:

Chair Randolph:

Natural Gas Vehicles for America (NGVAmerica), the national trade association for the natural gas vehicle industry, respectfully submits the attached comments on the need to produce and use renewable natural gas (RNG or biomethane) for the California transportation sector (especially for medium- and heavy-duty on and off road applications). The California Air Resources Board (CARB) has shown that it understands that to promote a cleaner environment effectively and quickly RNG is an essential component of the Low Carbon Fuel Standard (LCFS) program and NGVAmerica appreciates CARB leadership in this.

Sincerely,

Daniel J. Gage
President
NGVAmerica

Attachment: www.arb.ca.gov/lists/com-attach/24-dairywkshp220329-ws-UD5XNlMkV2UBaght.pdf

Original File Name: NGVAmerica Comments on the RNG Imperative for CA - Apr 12 2022.pdf

Date and Time Comment Was Submitted: 2022-04-12 07:59:26

No Duplicates.

# Comment 24 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Joe
Last Name: Ayala
Email Address: joe.ayala@wartsila.com
Affiliation: Wartsila

Subject: Comments on Workshop on Methane, Dairies and Livestock, and Renewable Natural Gas in Calif
Comment:

The Honorable Liane Randolph, Chair
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: CARB Response April 2022

Dear Chair Randolph:

My name is Joe Ayala, General Manager of Wärtsilä North America Inc. Wärtsilä is a global leader in innovative technologies and lifecycle solutions for the marine and energy markets. We emphasize innovation in sustainable technology and services to help our customers continuously improve their environmental and economic performance. Our dedicated and passionate team of 17,000 professionals in more than 200 locations in 68 countries shape the decarbonization transformation of our industries across the globe. In 2021, Wärtsilä’s net sales totaled EUR 4.8 billion. Wärtsilä is listed on Nasdaq Helsinki.

I am writing today in response to the Methane, Dairies and Livestock, and Renewable Natural Gas in California Workshop (Workshop) held by the California Air Resources Board (CARB) on March 29. It was made clear during the Workshop that reducing methane emissions from dairies and livestock facilities is critical to California achieving its climate goals. One of the key takeaways for CARB to ensure reduced methane emissions is for CARB to continue to incentivize the development of anaerobic digesters on dairy and livestock facilities as well as support the use of biomethane from these systems in the Low Carbon Fuel Standard (LCFS) and other programs. Not only are anaerobic digesters and related technologies critical to reaching California's climate goals, but continued support of anaerobic digesters on dairies and other livestock operations is also required by Senate Bill 1383 (SB 1383) (Lara, 2016) and multiple other laws in California.

CARB staff presented several times throughout the day on the structure, requirements and results of the program thus far and recently released the last version of the CARB “Analysis of Progress toward Achieving the 2030 Dairy and Livestock Sector Methane Emissions Target” report. According to this analysis the 2030 target of SB 1383 will not be met without continued investment in dairy and livestock sector methane reduction projects. The data indicate that it will cost an estimated $75 million per year to meet the target if the current split between the Alternative Manure Management Program (AMMP) and Dairy Digester Research and Development Program (DDRDP) is maintained.

Throughout the Workshop we heard from commenters and speakers who were opposed to dairy and livestock biogas and suggested that

California could become carbon neutral, with clean air, clean water, and provide environmental justice for all Californians without an impact on the dairy and livestock industries. Most of these speakers were associated with the Leadership Counsel for Justice & Accountability and they failed to provide specifics on how California would be able to achieve its climate goals AND maintain the economic vitality and productivity of the dairy and livestock sectors. Rather the commenters and speakers used generalities to argue against what they consider “factory farms” and “factory farm gas”.

We also heard from several experts working in the biogas industry and at state and federal agencies working closely with the biogas industry. Many of them stated that the LCFS program is working, and with increased support and incentives it will meet the 2030 target of SB 1383 without regulating dairy products and milk, the number one ranked commodity product produced in the state of California or effecting the almost $58 billion economy that California Dairy has created.1 Many of these speakers mentioned that the only proven technology for significantly reducing emissions is anaerobic digestion (AD) and that, where possible, pasture based dairies have already been implemented. They pointed out that the Intergovernmental Panel on Climate Change (IPCC) recognizes AD as the leading technology to address climate change. Dairies have made incredible progress as a sector and AD has been proven to be the most effective solution available today to solve many of the climate-related issues in California.

I would like to comment specifically on the following issues that were raised during the workshop:

Dairy opponents have submitted a petition to CARB to exclude dairy biomethane from the LCFS.

This petition, if accepted, would clearly violate the following requirements of SB 1383 specific to dairy biomethane:

• The requirement that CARB “develop a pilot financial mechanism to reduce the economic uncertainty associated with the value of environmental credits, including credits pursuant to the Low-Carbon Fuel Standard regulations . . . from dairy-related projects producing low-carbon transportation fuels.”2
• The requirement to adopt a mechanism to provide LCFS credits for 10 years to dairy biomethane producers that begin production before the adoption of dairy methane regulations.3
• The requirement that the California Energy Commission recommend measures to increase the production and use of biomethane, with priority going to “fuels with the greatest greenhouse gas emissions benefits, including the consideration of carbon intensity and reduction in short-lived climate pollutants.”4

Accepting the petition would also violate other California laws calling for in-state biomethane production, including:

• AB 1900 (Gatto, 2012) requires that “the commission shall adopt policies and programs that promote the in-state production and distribution of biomethane. The policies and programs shall facilitate the development of a variety of sources of in-state biomethane.”5
• SB 1122 (Rubio, 2012) requires the California Public Utilities Commission (CPUC) to “encourage gas and electrical corporations to develop and offer programs and services to facilitate development of in-state biogas for a broad range of purposes.”6
• AB 2313 (Williams,

2016) requires the CPUC to “consider options to increase in-state biomethane production and use.”7
• SB 840 (Budget, 2016) states that for “California to meet its goals for reducing emissions of greenhouse gasses and short-lived climate pollutants, the state must . . . increase the production and distribution of renewable and low-carbon gas supplies.”8
• SB 1383 (Lara, 2016) requires state agencies to “consider and, as appropriate, adopt policies and incentives to significantly increase the sustainable production and use of renewable gas, including biomethane and biogas.”9 SB 1383 also requires the Commission to “consider additional policies to support the development and use in the state of renewable gas, including biomethane and biogas, that reduce short-lived climate pollutants in the state.”10
• The requirement that the CPUC consider “adopting a biomethane procurement program focused on in-state and delivered biomethane.”11

Not only would accepting the petition be bad policy if one truly wants to make progress on reducing carbon emissions, but there is simply no way to exclude dairy biomethane from the LCFS without violating the unambiguous language and intent of California state law. There is also virtually no way to meet the 40 percent methane reduction target without dairy digesters, which are providing by far the greatest methane reductions of any programs or investments to date.12,13

Biogas systems are the number one technological approach to capturing and utilizing baseline short-lived methane emissions from wastewater and waste solids while also producing renewable energy and fuels for additional greenhouse gas (GHG) reductions from fossil fuel offsets.

According to a December 15, 2021, report “Assessing California's Climate Policies—Agriculture” published by the Legislative Analyst's Office (LAO)14, CARB estimates that all DDRDP projects (including those funded but not yet implemented) will provide significant GHG reductions totalling 2.1 million metric tons of carbon dioxide equivalents annually. The estimated emission reductions for each project will vary based on several factors, particularly the amount of manure flushed into the digester and the end use of the biogas captured. CARB12,13 estimates that the program reduces emissions at a state cost of $9 per ton, which is one of the lowest costs per ton estimates among Greenhouse Gas Reduction Fund (GGRF) programs. (For context, allowances under the cap and trade program—which puts a price on each ton of GHG emissions in the state—sold for about $28 per ton at the November 2021 auction.)

In CARB’s methodology, emission reductions for DDRDP projects come from two major sources. First, estimates include reductions associated with avoided methane emissions – specifically, the methane emissions captured by the digester that otherwise would have been released into the air. According to information provided by CARB, more than 75 percent of the estimated emission reductions are from avoided methane, though the amount can vary depending on the project.

Second, estimates include reductions associated with avoided CO2 emissions, which assume that fossil fuels are displaced by the biogas (and biomethane) produced by a digester. (We note that the combustion of biogas [and biomethane] produces CO2 emissions, but these emissions are not included in the state’s GHG inventory because they are biogenic rather than from fossil fuels.) Given that most digester projects upgrade biogas to biomethane for transportation fuel, avoided CO2 emissions for most projects

largely come from the displacement of fossil fuels used in the transportation sector. The current methodology also includes avoiding CO2 emissions for projects that displace fossil fuels in natural gas pipelines and in electricity and heat generation.

Biogas systems, particularly those on dairy and swine farms, have played and are playing a critical and primary role in meeting the State of California and CARB goals related to Short Lived Climate Pollutants. Biogas systems supply low carbon intensity renewable transportation fuel to the LCFS program for mandated and scheduled lowering of carbon footprint of consumed transportation fuel in the state. For California to meet the targeted and scheduled methane reduction goals for dairy farms in the state requires that we utilize the proven and tested technology that AD offers.

The adoption of biogas systems within the LCFS program, both in-state and out-state, and their subsequent critical role in meeting state goals, results from a now proven, LCFS-driven, economic model. This model has allowed for unprecedented private/public/farmer partnerships and allows costs/revenues/risks and viability of project development to be shared. This thriving ecosystem would not function properly if it could only rely on farm investments.

The ultra-low carbon intensity (CI) within the dairy and swine biogas sector is real and well-vetted within the national laboratory-developed Greenhouse Gases, Regulated Emissions, and Energy Use in Technologies (GREET) model. As such, anyone who values science must appreciate their role in meeting GHG and climate goals, and not selectively replace them with non-scientific reasoning.

The low CI of these projects arises from a combination of well-to-wheels carbon gains plus the methane offsets from baseline methane emissions from manure management, storage, and application. Methane offsets from baseline emissions are a legitimate accounting practice as baseline, pre-biogas systems emissions exist, and are largely removed through the installation of the biogas system.

The United Nation’s IPCC recognizes the methane reduction potential from AD as up to 99 percent15, and that, along with other Waste-to-Energy technologies, if used with appropriate air emissions technology, can produce clean energy. The IPCC acknowledges however, that if not used properly they can exacerbate air quality issues16 and can contribute to fugitive emissions that may reduce GHG reduction benefits17. Appropriately, in developing the LCFS regulation, CARB addressed these potential adverse impacts. Per the LCFS regulation, all projects, including biogas projects, are required to comply with all laws that pertain to them, including those associated with air and water quality. Furthermore, in determining a CI score and having it annually verified by third party auditors, and approved by CARB, dairy and swine biogas projects are required to account for any fugitive emissions that may occur along with the emissions associated with energy inputs necessary to operate the projects.

Some of the language used by those who want to eliminate dairy and livestock sector methane reduction projects is purposefully misleading.

Opposition Claim 1: Dairies and livestock facilities are “Factory Farms” producing “Factory Farm Gas”.

The continual use of the terms “Factory Farm” and “Factory Farm Gas” when referring to larger livestock facilities and the biomethane generated from their AD systems, purposefully mischaracterizes the true nature of these farms. As

voiced by the California dairy producers during the comment period of the workshop, the dairies in California, as well as elsewhere in the U.S., are primarily multiple-generation, family-run businesses with a long history of ties to their respective communities. They employ people directly and bring other important jobs, local spending revenues, and valued nutritional products to those communities where they are located, the nation and the world. This can be verified with data from the USDA's National Agricultural Statistics Service (NASS) 2017 Census of Agriculture, which stated that 38,007 of 40,336 dairy farms in the United States are family owned (94.2 percent).18

Texas dairy farmer Sieto Mellema captured the sentiment of many dairy producers when he said that when he looks out among his 3,000 cows and thousands of acres of crops, he does not see a factory. He sees a dairy farm that he and his family run with the utmost care and respect for their animals and their land. “Some people see our farm and they think it’s too big to be normal, so it must be a ‘factory,’” he said. “We do tours here all the time and everyone is astounded with the care we provide our cows. Even people in a rural town like ours (Dalhart) are amazed, so I can see someone in a large city having this mindset. The term factory farm is misleading, but it is just not understanding farming on the part of people who say that. It hurts me to the core to hear my farm called that, but all you can do is educate.”

In addition, according to the U.S. Environmental Protection Agency’s AgSTAR program, of the 317 currently operational biogas systems on farms, there is a wide diversity of farm sizes using biogas systems. Large farms aren’t the only ones using them. Specifically:

• Of the 317
farm-based biogas systems, 265 use dairy manure (84 percent). Of those:
• 30 farms have <
500 cows (11 percent)
• 43 have 500-1,000
cows (16 percent)
• 85 have
1,000-3,000 cows (32 percent)
• 55 have
3,000-10,000 cows (20 percent)
• 11 have 10,000+
cows (4 percent)
• For 41, no farm
size data are currently available (15 percent)

Oppositional Claim 2: Dairies and other livestock producers are polluters.

The family dairies of California adhere to all sorts of national, state, and local regulations, always aiming to be good stewards and citizens to the environment and community. These hardworking, well-meaning families have demonstrated their willingness to improve the environment by adopting biogas systems to improve upon their existing stewardship. While any industry sector or population will have individual outliers, associating the small number of bad actors with poor stewardship by the vast majority is disingenuous at best and inflammatory at worst. The overwhelming percentage of farmers meet all regulations, which are some of the most stringent in the country, and are not negligent, lawless, or purposeful polluters.

• According to the
Innovation Center for U.S. Dairy, the greenhouse gas footprint of the nation's dairy producers is less than 2 percent of the nation’s total.19
• Thanks to

improvements in sustainable farming practices, U.S. dairy farmers are now using 65 percent less water and 90 percent less land to produce 60 percent more milk.20
• Thanks to improved farming practices, the carbon footprint of producing 1 gallon of milk shrunk by 19 percent between 2007 and 2017, requiring 30 percent less water and 21 percent less land.20
• 34 dairy companies representing 75 percent of U.S. milk production have voluntarily adopted the U.S. Dairy Stewardship Commitment to help the U.S. dairy industry collectively advance, track and report progress on social responsibility areas important to consumers, customers, and communities.21
• U.S. dairy is a diverse, complex sector made up of just under 30,000 farms and hundreds of dairy companies, with representation across the entire country.22
• A 2021 World Wildlife Fund analysis found that U.S. dairy farms could achieve net zero emissions in as few as 5 years if the right incentives and supportive policies are put in place. The investment would mean a return of $1.9 million or more per farm. If even 10% of dairy production in the U.S. were to achieve net zero, GHG emissions could be reduced by more than 100 million tons.23
• A team of Virginia Tech researchers found that the removal of dairy cows from the U.S. agricultural industry would only reduce greenhouse emissions by about 0.7 percent — and it would significantly lower the available supply of essential nutrients for humans.24
• Dairy packs a serious nutrient punch, effectively, efficiently, and affordably providing the annual protein requirements of 169 million people and the annual calcium requirements of over three-quarters of the population.24
• Dairy encompasses the six billion people who eat and drink its products annually, as well as the 600 million people who live and work on the world’s 133 million dairy farms, and the one billion people who rely on the dairy sector to support their livelihoods and communities.25
• In the U.S., there are 280 on-farm anaerobic digester systems used to convert manure into renewable energy. Of those, 77 percent are located on dairy farms.26
• 80 percent of what dairy cows consume cannot be eaten by people, including by-products of other foods like citrus pulp and almond hulls.27

Oppositional Claim 3: Programs designed to help pay for the technologies and practices that reduce GHG emissions on livestock operations are subsidies and dairies and other livestock operations should be regulated, not subsidized.

Dairies and livestock operations are already some of the most regulated industries in the country. They are required to meet and maintain compliance with federal, state, and local regulations at all times. Without the current help from California programs, many of the family farms across California would be unable to afford biogas systems and would not be able to capture and reduce the methane emissions created by their farms. Those making this charge believe that all animal agriculture is done at the cost of the environment and the underserved communities around them. This, however, undercuts the economic value of dairy's role in a healthy, sustainable diet and its efforts to strengthen and connect the communities it serves.

Oppositional Claim 4: Dairies are using biogas systems to grow and pollute.

The dairy industry in California has been experiencing

consolidation for decades due to the inherent economies of scale in the industry and specifically the necessity to manage costs associated with meeting regulatory standards, and a volatile pricing system where the price farms receive for their milk is often out of their control. The United States Department of Agriculture Economic Research Service (USDA-ERS) recently published a comprehensive analysis of this trend towards consolidation. Put simply, many dairies are getting larger, but this is because larger operations can have more efficiency in production per cow, which results in a lower number of total cows per unit of milk produced. Biogas systems are not the cause of consolidation. Biogas systems are the best way to lower GHG’s and produce renewable energy for other sectors of the economy.28

In his testimony during the workshop, Dr. Aaron Smith from UC Davis compared the value of producing milk to the value of biogas. Dr. Smith said farmers may consider expanding their herds in order to produce biogas since his analysis concluded that biogas may be worth about half as much as milk when LCFS and renewable identification number (RIN) credits are high. However, his analysis excluded the fact that the farms only receive a portion of the revenue generated from a biogas operation. Most biogas projects are owned and operated in conjunction with companies that have skilled specialties in biogas production. This allows the farmer to reduce financial risk and means the revenue to the farmer is usually much less than Dr. Smith’s analysis showed.

Oppositional Claim 5: The emissions reductions from biogas systems are greenwashing.

Studies have shown that recycling all organic waste and other biomass could lead to renewable natural gas (RNG) production at a scale of approximately 20 percent industrial usage of fossil natural gas and 50 percent of residential use. This is not an insignificant fraction of the natural gas consumption. In addition, many gas utilities, like Southern Company, National Grid, SoCalGas, and others, are implementing plans to aggressively reduce the amount of gas needed to meet residential and industrial needs. This means that, in combination with increased efficiency, RNG and hydrogen, will actually be able to meet even larger percentages of gas use with renewable gas. True decarbonization of the gas grid. Similar to California’s vision for decarbonization, Europe is embracing a similar vision through their Renewable Energy Directive, or “RED II”, with a target of 32 percent renewable energy supply by 2030.

Professor and Cooperative Extension Air Quality Specialist at the University of California, Davis, Dr. Frank Mitloehner recently commented in a Clarity and Leadership for Environmental Awareness and Research at UC Davis article that he is “...always flabbergasted when [he sees] actual methane reductions hinted at as ‘greenwashing.’ Digesters have been one of the most effective tools in curbing carbon emissions from animal agriculture and even displacing some fossil fuel use in California.”29

The net benefit of methane capture using digester systems is clear from a scientific basis, as evidenced in the carbon intensity (CI) score derived from avoided life cycle GHG emissions. It is unjustified to infer that leakage compromises this value proposition at farm-scale installations, while most of the concern focuses on household-scale digesters and not commercial installations.30

It is recognized that scientific characterization of total emissions from dairy digester systems is neither comprehensive nor do these studies suggest a systemic problem. One study focused on emissions from UK biogas plants discussed results from measurements of only ten digester systems31 with almost half demonstrating emissions rates that are less than 2 percent of total production.

Another study by the International Energy Association found that cross-comparison was difficult between different methodologies while acknowledging that episodic events may compromise measurement of average annual emissions calculations.32 Meanwhile, this synthesis study shared results collected using thirteen measurement methods with an average of 2-3 percent loss versus total production.

It is likely that implementation of best practices across the global biogas industry, from development and routine inspection procedures, may result in leak rates on the lower end of these studies (<2 percent). Furthermore, high RNG product commodity values, driven by the RIN and LCFS markets, encourage operators to adopt best practices with respect to leak detection and mitigation to maximize throughput.

Oppositional Claim 6: Methane leakage from the natural gas pipeline system makes the use of renewable natural gas more harmful than the benefit it provides.

While it is true that there is leakage in any industrial processing, including biogas, it is important to note that studies show this to be within 0-15 percent, with agricultural biogas facilities on the low end at approximately 2 percent. Also, CARB already incorporates this into their carbon accounting using GREET analyses.33 More importantly, we can assume that without biogas systems, the baseline is 100 percent methane released into the atmosphere. Therefore, it is more accurate to not criticize a 2 percent loss but applaud a 98 percent capture and conversion. Furthermore, in generating LCFS credits, projects must account for any methane venting events which occur during operations.

According to published data for the United States, methane emissions from conventional natural gas distribution mains account for 32 percent of the industry's total methane emissions. It is believed that cast iron pipelines contribute the most to these emissions, even though they represent only 3 percent of the miles of all U.S. distribution mains. These estimates are based on national methane leak rates from an EPA-funded study which estimated emissions from all sources in the U.S. natural gas industry.34

Since 1992 the EPA has gathered over 100 companies to participate in their Natural Gas Star Program, a voluntary program intended to reduce the amount of methane leakage from distribution pipe systems. In 1997, because of the Star Program, the U.S. Environmental Protection Agency EPA released a report which indicated that a potential increase in natural gas sales would increase methane output by 0.5 to 1 percent annually. Using 1992 as their baseline, the EPA estimated that 1.4 percent (plus or minus 0.5 percent) of all gas that travels through pipes in the United States was emitted. Overall, of all the methane released by industry in the United States, 20 percent of methane comes from the natural gas sector. Landfills contribute the most with 31 percent.35

In the same report, the EPA stated that of the methane released by the natural gas industry, 37 percent comes from "Transmission/Storage", 24 percent comes from "Distribution" and 27 percent comes from production. The EPA noted that during summer peak times, emissions were estimated to the highest. The study, contrary to the more recent findings by a Greenpeace funded study in Europe, argues that using estimated emissions from 1992, the natural gas sector emits less greenhouse gas emissions than coal or oil.36 Currently it is estimated that 2 percent of total greenhouse gas emissions come from the country's natural gas industry. In 2006, the natural gas industry operated over 38,000 miles of natural gas pipelines that were made of cast iron, the leakiest of all types of gas piping. In 2009, 4,000 miles of new pipes were

laid.37

Further studies of methane gas loss rates need to be completed to assess the situation globally. Assessing these loss rates will help reduce methane leaks from natural gas distribution in the United States.38

Biogas systems are a valuable tool, but not a panacea to solve all of the problems related to manure management.

Biogas systems are at their heart a biological means to convert carbon into methane and capture it for use as a renewable fuel. This process specifically decreases baseline methane emission into the atmosphere by converting the methane back into carbon dioxide. Although they store waste, reduce odor, and make subsequent treatment much easier – the digester itself is not designed nor functions as a nutrient treatment system. Anaerobic digesters are an essential part of livestock manure management systems but are not designed to be replacements for proper nutrient management.

Digesters rely on biological processes to break down biological material. Any biological system has inherent variability, making each digester unique in its operation and performance. This is influenced by feedstock, weather and of course, management. Digesters are flow-through components of a manure management system, linking collection and storage. Too often people look at them as storage systems only or as complete treatment systems that solve every problem, neither of which is true.

Biogas systems prevent the release of methane from uncovered lagoons and lead to a direct reduction in GHG. A well-designed biogas system can capture as much as 80 percent of the methane that would be produced from a waste stream that was maintained at 100 degrees F. Even once cooled down, the emissions from the digestate are not of significant quantity.

Biogas systems are also highly effective at reducing odors, via the biological conversion of odor-causing volatile organic acids to biogas. “Using volatile fatty acids (VFA) as an indicator, anaerobic digestion exhibited an effective reduction of dairy manure odor offensiveness." Page et al (2015) based this conclusion on a laboratory experiment that considered four specific volatile fatty acid concentrations over time for manure before and after digestion, and a reduction in total VFA by 86–96 percent.39

Treatment through anaerobic digestion can reduce the number of pathogens within the manure and therefore limit the number of pathogens entering the environment. Anaerobic digestion of manure has a pathogen reducing effect with as much as 95-98 percent of common pathogens eliminated in mesophilic (~ 100 degrees Fahrenheit) digesters. The reduction in pathogens has the potential to be of benefit for: manure application in impaired watersheds when trying to manage certain pathogens such as Mycobacterium paratuberculosis (MAP or Johne’s) or Salmonella, and when considering a community-based anaerobic digester where manure from multiple farms is combined, treated, and AD solids and AD effluent returned to the farms.40

Partial conversion of organic forms of macro-nutrients to inorganic forms such as organic-P and organic-N to inorganic forms such as phosphates and ammonia produces a product (digestate) that we perceive to be uniquely different than raw manures, and which hold potential for either equal or improved nutrient and crop management when managed and applied correctly.

Biogas systems also play a potential positive role in improving air quality by reducing the hydrogen sulfide ($H_2S$) released to air as compared to a non-AD baseline. While the AD process produces

H2S, biogas systems, with their air permits, practice near total control and conversion of the H2S to less innocuous forms.

In addition to the above-mentioned benefits, biogas systems do not play a role, positive or negative, in nitrate production and release concerns or phosphate release and eutrophication concerns.

As evidenced by the Workshop testimony from Newtrient’s Mark Stoermann, the core biogas system can serve to produce a differentiated digestate wastewater which can utilize add-on technologies and assist in more efficiently operating those add-on technologies for alleviation of nutrient concerns that are not otherwise in the purview of the AD process.

In closing, we would like to present some direct quotes and evidence of global support for biogas system use as a tool to address the GHG emission problem:

According to the United Nations, UN Environment Programme (UNEP) and Climate & Clean Air Coalition (CCAC) “... tackling methane emissions is the most immediate and cost-effective way to avert climate catastrophe, while identifying AD as a readily available low-cost technology that can help reduce these emissions.”41

The European Union Methane Strategy highlights control of methane emissions as vital to meeting continental and global climate goals with the strategy proposing enhanced and targeted support for acceleration of biogas projects and biogas markets as major drivers for achieving their goals.42

The International Energy Agency says that the case for biogas and biomethane lies at the intersection of two critical challenges of modern life: dealing with the increasing amount of organic waste that is produced by modern societies and economies, and the imperative to reduce global greenhouse gas (GHG) emissions.43

By turning organic waste into a renewable energy resource, the production of biogas or biomethane offers a window into a world in which resources are continuously used and reused, and one in which rising demand for energy services can be met while also delivering wider environmental benefits. In assessing the prospects for “organic growth” of biogas and biomethane, the International Energy Agency (IEA) notes the expansive role AD and biogas can play in the transformation of the global energy system.43

The White House Office of Domestic Climate Policy, in their report on U.S. methane emissions reduction action plan, emphasizes the vital role anaerobic digestion, biogas, and associated markets will play in the reduction plan, particularly as it relates to the U.S. agricultural industry and the USDA.44

U.S. EPA flatly states that “AD [is] a common-sense technology to reduce methane emissions.”45

And finally, two quotes from Professor and Cooperative Extension Air Quality Specialist at the University of California, Davis, Dr. Frank Mitloehner, may be the best way to end these comments, as ABC cannot emphasize agreement strongly enough:

“In the race to slow climate change and reduce California’s methane emissions to 40% below 2013 levels by 2030, transforming methane from manure into biogas with digesters leads all other initiatives.”46

“In California, digesters are REDUCING emissions at an

incredibly cost-effective rate. Digesters have reduced 30% of the GHGs mitigated in the California Climate Investment initiative with less than 2% of state funding.”47

I would like to thank you for the opportunity to comment and for the excellent work that CARB is doing in leading the way in reducing the impact of short-lived climate pollutants for California and the entire nation.

Sincerely,
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References

1 University of California, Agricultural Issues Center. (2019). Contributions of the California Dairy Industry to the California Economy in 2018. https://aic.ucdavis.edu/wp-content/uploads/2019/07/CMAB-Economic-Impact-Report_final.pdf
2 Health & Safety Code section 39730.7(d)(1)(B).
3 Health & Safety Code section 39730.7(e).
4 Health & Safety Code section 39730.8(e).
5 AB 1900 (Gatto, 2012) adding Section 399.24(a) to the Public Utilities Code.
6 SB 1122 (Rubio), Statutes of 2012, Chapter 612, codified at Public Utilities Code § 399.20(f)(2)(D).
7 Public Utilities Code § 784.2.
8 Senate Bill 840 (Budget), Statutes of 2016, SEC. 10, §§ (b) – (i).
9 Health and Safety Code 39730.8(c).
10 Health and Safety Code 39730.8(d).
11 Public Utilities code section 651(b).
12 California Climate Investments. (2021). 2021 Mid-Year Data Update. https://ww2.arb.ca.gov/sites/default/files/auction-proceeds/cci_2021mydu_cumulativeoutcomessummarytable.pdf
13 California Climate Investments. (2021). 2021 Annual Report.
14 Legislative Analyst’s Office (LAO). (2021). Assessing California’s Climate Policies—Agriculture. Patek. https://lao.ca.gov/Publications/Report/4483
15 IPCC, 2021: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. (Table 11.3 page 11-57). [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press. In Press. https://www.ipcc.ch/report/ar6/wg1/

16 IPCC, 2021: Climate Change 2021: The Physical Science Basis. Contribution of Working
Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. (Pg 6-47). [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press. In Press. https://www.ipcc.ch/report/ar6/wg1/
17 IPCC, 2021: Climate Change 2021: The Physical Science Basis. Contribution of Working
Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. (Pg 6-47). [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press. 11In Press. https://www.ipcc.ch/report/ar6/wg1/
18 USDA, National Agricultural Statistics Service. (2019). 2017 Census of Agriculture. https://www.nass.usda.gov/Publications/AgCensus/2017/index.php
19 International Dairy Journal. Thoma et al. (2013). Greenhouse gas emissions from milk production and consumption in the
United States: A cradle-to-grave life cycle assessment circa 2008 (31, S3-S14) https://dx.doi.org/10.1016/j.idairyj.2012.08.013
20 Journal of Animal Science. Capper, Cady, and Bauman. (2009). The environmental impact of dairy production: 1944 compared with 2007 (87:6, 2160–2167). https://doi.org/10.2527/jas.2009-1781
21 Journal of Animal Science. Capper and Cady. (2020). The effects of improved performance in the U.S. dairy cattle
industry on environmental impacts between 2007 and 2017 (98:1). https://doi.org/10.1093/jas/skz291
22 USDA, National Agricultural Statistics Service. (2022) Milk Production (P.18) https://usda.library.cornell.edu/concern/publications/h989r321c
23 WWF. Devine. (2021). Tackling Scope 3 Emissions and Reaching Net Zero in Dairy. https://www.worldwildlife.org/blogs/sustainability-works/posts/tackling-scope-3-emissions-and-reaching-net-zero-in-dairy
24 Journal of Dairy Science. Liebe, Hall and White. (2020). Contributions of dairy products to environmental impacts and
nutritional supplies from United States agriculture (103:11, 10867-10881). https://doi.org/10.3168/jds.2020-18570
25 Global Dairy Platform. (2020). Driving Development and Self-Reliant Inclusive Economies. https://www.globaldairyplatform.com/development/
26 EPA - AgStar. (2022). https://www.epa.gov/agstar/livestock-anaerobic-digester-database
27 Innovation Center for U.S. Dairy. Tricarico. (2016). Role of Dairy Cattle in Converting Feed to Food. https://docs.wixstatic.com/ugd/36a444_d950ca21aca54a9e92d4be516cad4998.pdf
28 U.S. Department of Agriculture, Economic Research Service. Njuki. (2022). Sources, Trends, and Drivers of U.S. Dairy
Productivity and Efficiency. https://www.ers.usda.gov/publications/pub-details/?pubid=103300
29 Twitter (@GHGGuru). Mitloehner. (2022). “I am always flabbergasted when I see actual methane reductions hinted at as
“greenwashing….” https://twitter.com/ghgguru/status/1484317713233108999?s=10&t=0CTf1Fzl0cgVKDZb4hSNFw
30 Searchinger et al. (2021). Opportunities to Reduce Methane Emissions from Global Agriculture. https://scholar.princeton.edu/sites/default/files/methane_discussion_paper_nov_2021.pdf
31 Waste Management. Bakkaloglu et al. (2021) Quantification of

methane emissions from UK biogas plants. (124,
82-93).
https://doi.org/10.1016/j.wasman.2021.01.011
32 IEA Bioenergy. Liebetrau et al. (2017). Methane Emissions
from Biogas Plants: Methods for Measurement Results
and
Effect on Greenhouse Gas Balance of Electricity Produced.
https://www.ieabioenergy.com/blog/publications/methane-emissions-from-biogas-plants-
methods-for-measurement-results-and-effect-on-greenhouse-gas-balance-of-electricity-
produced/
33 U.S. Energy Information Administration. (2022). Frequently
Asked Questions.
https://www.eia.gov/tools/faqs/index.php#naturalgas
34 Pipeline and Gas Journal. Bylin, et al. (2009). New
Measurement Data Has Implications for Quantifying Natural
Gas
Losses From Cast Iron Distribution Mains.
https://www.epa.gov/natural-gas-star-program/new-measurement-data-has-implications-
quantifying-natural-gas-losses-cast
35 U.S. Environmental Protection Agency. (1996). Methane
Emissions from the Natural Gas Industry.
https://www.epa.gov/natural-gas-star-program/methane-emissions-natural-gas-industry
36 U.S. Environmental Protection Agency. (2008). Reduction
Opportunities for Local Distribution Companies.
37 New York Times. Revkin and Krauss. (2009). Curbing Emissions
by Sealing Gas Leaks.
https://www.nytimes.com/2009/10/15/business/energy-environment/15degrees.html
38 U.S. Environmental Protection Agency. (2008). Natural Gas
STAR: Methane Emission Reduction Opportunities for
Local
Distribution Companies.
39 Biosystems Engineering. Page et al. (2014). Characteristics
of volatile fatty acids in stored dairy manure before and
after
anaerobic digestion. (118,16-28).
https://doi.org/10.1016/j.biosystemseng.2013.11.004
40 Livestock and Poultry Environmental Learning Community.
Saunders and Harrison. (2019). Pathogen Reduction
in
Anaerobic Digestion of Manure.
https://lpelc.org/pathogen-reduction-in-anaerobic-digestion-of-manure/
41 United Nations Environment Programme. (2021). Global Methane
Assessment: Benefits and
Costs of Mitigating Methane Emissions.
https://www.unep.org/resources/report/global-methane-assessment-benefits-and-costs-
mitigating-methane-emissions
42 European Commission. (2020). Reducing greenhouse gas
emissions: Commission adopts EU Methane Strategy as part
of
European Green Deal.
https://ec.europa.eu/commission/presscorner/detail/en/ip_20_1833
43 IEA. (2020). Outlook for biogas and biomethane: Prospects for
organic growth.
https://www.iea.org/reports/outlook-for-biogas-and-biomethane-prospects-for-organic-growth
44 The White House. (2021). U.S. Methane Emissions Reduction
Action Plan.
https://www.whitehouse.gov/wp-content/uploads/2021/11/US-Methane-Emissions-Reduction-
Action-Plan-1.pdf
45 World Biogas Association. (2021). World Biogas Association at
COP26: “Anaerobic digestion
a key technology to reduce methane emissions and fulfill Global
Methane Pledge.”
https://www.worldbiogasassociation.org/world-biogas-association-at-cop26-anaerobic-
digestion-a-key-technology-to-reduce-methane-emissions-and-fulfill-global-methane-
pledge/#:~:text=The%20US%20Environmental%20Protection%20Agency,in%20the%20EU's%20methane%20
strategy.
46 Clear Center. Mitloehner (2022). No BS – Dairy
Digesters Work.
https://clear.ucdavis.edu/blog/no-bs-dairy-digesters-work
47 Twitter (@GHGGuru). Mitloehner. (2022). “In California,

digesters are REDUCING
emissions….”
https://twitter.com/ghgguru/status/1484317714889916418?s=10&t=0CTf1Fzl0cgVKDZb4hSNFw

Attachment: www.arb.ca.gov/lists/com-attach/25-dairywkshp220329-ws-WywAZ1YlUnUFcAhh.pdf

Original File Name: Wartsila Letter-  Hon. Liane Randolph - CARB - Biogas.pdf

Date and Time Comment Was Submitted: 2022-04-12 08:46:15

No Duplicates.

# Comment 25 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Lynn
Last Name: Lyon
Email Address: llyon@usgain.com
Affiliation: U.S. Gain

Subject: The need for renewable natural gas (RNG or biomethane) for the California transport sector
Comment:

Chair Randolph and Committee:

The California Air Resources Board (CARB) has shown that it understands that to promote a cleaner environment effectively and quickly RNG is an essential component of the Low Carbon Fuel Standard (LCFS) program and NGVAmerica appreciates CARB leadership in this.

U.S. Gain is a leading producer of Renewable Natural Gas with over 40 production projects from a variety of feedstocks including agricultural, landfills and wastewater treatment facilities. We are diversified and vertically integrated in all aspects of the energy supply chain, enabling access to the cleanest fuel and renewable energy, at the best value.

U.S. Gain is active in all forms of alternative fuels to decrease harmful transportation emissions including battery electric charging, hydrogen fueling for fuel cell electric vehicles and renewable natural gas. We are also actively working with our sister company U.S. AutoForce, with 8 locations in California,  to decrease emissions with our operations.

As a member of NGVAmerica, U.S. Gain supports their endorsement of strategies that promote the use of zero emission vehicles (ZEV), near-zero emission vehicles and a transition to low and net negative carbon transportation fuels such as renewable natural gas, and eventually hydrogen. We understand there is no one solution to the pressing environmental issues facing the transportations sector. CARB should move quickly to deploy those technologies and solutions that are readily available, maximize cost-effective emission reductions, and provide a real pathway to carbon neutral or carbon-negative emissions.
Converting medium- and heavy-duty (M/HD) vehicle transportation networks to low NOx trucks operated on RNG provides a readily available, proven and cost-effective solution to accelerate the transition to a low-carbon transportation future. Further, dedicating program resources to cleaner alternative fuel technologies that are available now will significantly and immediately benefit all communities by maximizing the displacement of older, higher emitting diesel trucks and buses, including those higher emitting vehicles that operate in communities that are underserved by current transportation options.

Near-zero engines operated on RNG produce at least 90% less NOx than the cleanest diesel engines and operate at virtually zero NOx emissions (0.02 g/bhp-hr or less). In California RNG is used to fuel low NOx vehicles providing reduced life cycle emissions of greenhouse gases (GHG) that in some cases can be net zero or even carbon-negative.

CARB data from the LCFS for Q3 2021 confirms the energy weighted

carbon intensity (CI) value of California's RNG vehicle fuel portfolio is below zero at -62.7 gCO2e/MJ (negative CI for last 5 reporting quarters). California fleets that fueled with bio-CNG in 2020 achieved carbon negativity in 2020 for the first time ever, with an annual average CI score of -5.845 gCO2e/MJ. Renewable CNG (dairy gas) is now close to -600 gCO2e/MJ. Additional information may be found at the following link: https://ww2.arb.ca.gov/resources/documents/lcfs-pathway-certified-carbon-intensities.

U.S. Gain believe that CARB must continue to include and promote the use of RNG low NOx trucks for the near term and beyond to reduce emissions from the transportation sector, especially in disadvantaged communities that have been relegated to diesel solutions while we wait on the EV industry to commercially mature. Some of the issues with M/HD ZEVs include:
• Vehicles can be ordered, but cannot be delivered
• Small-scale pilot service basis only today
• Substantial challenges whether duty cycles can meet business needs
• Limited service networks
• Cost of ZEV technologies substantially higher than non-ZEV technologies
• Affordability remains a significant barrier to large-scale adoption
• Little charging/fueling infrastructure exists
• Electrical distribution system upgrades required
• Power/fuel supply to support widespread deployment will take many years to develop

Low NOx vehicles with the potential of carbon net zero and even carbon negative emissions with RNG are:
• Commercially demonstrated and available today
• Sufficient fueling infrastructure that is largely funded by the private sector
• 90% cleaner than diesel trucks on NOx (without requiring after-treatment apparatus)
• 100% elimination of diesel particulate matter emissions
• When fueled by RNG, can provide substantial GHG emissions reductions
• More cost-effective than ZEV trucks, allowing limited incentive funds to stretch further
• Addresses elements of the transportation sector that are hard to electrify
• Enables a diversity of effective technology/fueling solutions
• Fueled with RNG that is produced from domestic, renewable, plentiful feedstock
• Supports sustainability goals of organizations and fleets
Moreover, the salient points to promote the use of RNG include:
• The immediate reduction of fugitive methane emissions is necessary to rapidly reduce the impacts of climate change
• Waste generators including livestock operators can gain a sustainable outlet for their waste
• Animal manure can be collected on a single large farm or combined from several "cluster" farms and delivered to a single anaerobic digester for RNG production
• If manure is stored in open lagoons that emit methane, moving it to enclosed digesters prevents those emissions
• Addresses agricultural waste and emissions to help offset costs thereby reducing pressure on food prices and farmers
• The RNG produced also displaces fossil NG that would have been consumed by NG vehicles, thereby reducing CO2 emissions
• Avoided methane emissions and displaced fossil CO2 emissions can produce large reductions in carbon intensity • The California Air Resources Board's assessment shows that RNG produced from dairy waste has one of the lowest carbon intensity (CI) ratings of any transportation fuel • RNG for transportation can reduce greenhouse gas emissions up to 283%, with an average of 51% reduction (varies by feedstock)

Real World Experience

Recently the California South Coast Air Quality Management District (SCAQMD) responded to communications from Environmental Justice and Environmental Health organizations objecting to the use of low NOx trucks in the heavy-duty vehicle sector. The SCAQMD response letter states:
"As the agency responsible for clean air in the greater Los Angeles area we have a statutory obligation to take all reasonable and feasible steps to reduce emissions. We face a rapidly approaching hard legal deadline in 2023 to meet the 1997 ozone standard, and 2031 for the 2008 ozone standard. The only way to get there is a massive push for cleaner heavy-duty trucks - the largest source of smog-forming emissions in our region - as soon as possible. While the amount of emission reductions needed to attain clean air standards is daunting, it would be irresponsible for our agency to effectively throw up our hands and not explore all options for reducing emissions now. Near-zero emission (NZE) technology has been commercially demonstrated and is available today, has sufficient fueling infrastructure that is largely funded by the private sector, and is at least 90% cleaner than new diesel trucks on NOx and 100% cleaner on cancer-causing diesel particulate matter. When fueled by renewable natural gas, these vehicles can also provide substantial greenhouse gas emission reductions. Further, these vehicles are far more cost-effective than ZE trucks, allowing limited incentive funds to stretch further. Given these benefits, it is disturbing that you advocate for investments only in technologies that are not yet ready for prime time, a position that would leave our residents no option but to continue to suffer the ill effects from diesel exhaust for years to come."

Amazon has ordered thousands of Classes 6 through 8 trucks, choosing low NOx vehicles because they would not buy diesel trucks and could not buy electric trucks now or in a reasonable timeframe. UPS, WM, Republic Services, Fort Collins Transfort Buses, Denver International Airport Buses and equipment, Los Angeles World Airports Buses, City of Los Angeles, City of Fresno Transit, LA Metro Transit, New York's Hunts Point fleet Industries and many other fleets have chosen low NOx trucks as the only available non-diesel heavy-duty truck that outperforms other alternative technologies in all aspects of vehicle operation.

To support low NOx markets in the United States, Asia, Europe, South America and elsewhere, Cummins has initiated a worldwide low NOx engine division to fulfill the demands for immediate diesel alternatives across the world. In addition to 3 heavy duty low NOx engines, they are bringing forward a new heavy-duty 15L engine that provides the power and performance of diesel and that is 500 pounds lighter and more efficient. Also, Hyliion is in the final stages of field testing its plug-in hybrid electric/CNG Class 8 truck that is scheduled to be commercially available in 2023.

As is evidenced in the above paragraphs, low NOx vehicles are growing in the M/HD truck market, especially as new technology is introduced, EV technology is delayed, cleaner engines are mandated and diesel prices continue to climb. It should be noted that using the AFLEET calculations, low NOx trucks are truly virtually zero since it takes only 1.05 low NOx trucks to equal the NOx tailpipe emissions reductions of a battery electric (BE) short-haul truck. When the range/duty cycle issues are factored in (may take more than one BE truck/bus to replace a diesel or low NOx truck/bus), the cost-effectiveness of using electric vehicles is a significant issue.

Investments in RNG-fueled trucks and transit buses accessing ports, cities, and densely-populated neighborhoods are the most immediate and fiscally-responsible investment to clean our air and combat climate change. Communities get more clean vehicles having greater clean air and climate impact for the money with RNG than with any other alternative fuel option, especially electric. No other transportation fuel is as sustainable, adaptive, and competitive

across all applications and vehicle classes.

Heavy-duty low NOx trucks are not demonstration science projects; they are proven, scalable, and on U.S. roads today. We will not meet emissions reductions goals or timeframes without using RNG.

Reduce Emissions Now and in the Future

More than four of every ten Americans live in communities with dangerously dirty air. According to the American Lung Association, over 135 million people are living in places with unhealthy levels of ozone or particle pollution. And the burden of living with unhealthy air is not shared equally; people of color are over three times more likely to be breathing the most polluted air than white people.1

U.S. Gain urges CARB to continue to support the development of dairy digesters and the use of dairy biomethane in the Low Carbon Fuel Standard and other programs. Reducing methane emissions from dairies is critical to achieve the state's overall climate goals and using that biomethane in heavy duty trucks that replace diesel trucks also provides enormous benefits for air quality. Continuing to support dairy digesters is also required by SB 1383 (Lara, 2016) and multiple other laws in California.
Low NOx engines are proven, cost-effective and available today for medium- and heavy-duty vehicles. Moreover, because RNG is used, life cycle greenhouse gas emissions from low NOx vehicles are reduced further. Fueling with RNG also creates new economic development for energy created from wastewater treatment, landfills, animal waste and other methane sources and significantly increases air quality by reducing the amount of methane released. We strongly believe that RNG-operated low NOx vehicles should not just be "allowed" but must be promoted in the CARB LCFS program if emissions reductions are to occur in any reasonable timeframe. Statutory requirements are pressing on California and CARB needs solutions that work now to decarbonize and clean California's environment. Therefore, we request that RNG-operated low NOx trucks be prominent in CARB's strategies as an immediate pathway to a zero emission future.

Thank you for your consideration, and please contact me or with any comments or questions.

Kind regards,

Lynn Lyon

Director of Sustainable Transportation
U.S. Gain, a U.S. Venture Company

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2022-04-12 08:56:59

No Duplicates.

# Comment 26 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Mark
Last Name: Stoermann
Email Address: mstoerm@newtrient.com
Affiliation: Newtrient

Subject: Newtrient CARB Workshop Comments
Comment:

Dear Chair Randolph:

Newtrient LLC respectfully offers these comments to the California Air Resources Board (CARB) in response to the "Methane, Dairies and Livestock, and Renewable Natural Gas in California" Workshop, presented on March 29, 2022.

Newtrient urges CARB to continue to support the development of anaerobic digesters (AD) on dairy and livestock facilities and the use of biomethane from these systems in the Low Carbon Fuel Standard (LCFS) and other programs. Reducing methane emissions from dairies and livestock operations is critical to achieve California's overall climate goals. Using biomethane in heavy duty trucks provides enormous benefits for air quality and represents the best environmental impact of any replacement fuel. Continuing to support anaerobic digesters on dairies and other livestock operations is also required by SB 1383 (Lara, 2016) and multiple other laws in California.

Thank you for the opportunity to comment and for the excellent work that CARB is doing in leading the way in reducing the impact of short-lived climate pollutants for California and the entire nation.

Sincerely,
Mark Stoermann
Chief Operating Officer
Newtrient LLC

Attachment: www.arb.ca.gov/lists/com-attach/27-dairywkshp220329-ws-WjQFZlwqVXIHc1I7.pdf

Original File Name: Newtrient CARB Workshop Comments April 12 2022.pdf

Date and Time Comment Was Submitted: 2022-04-12 09:58:16

No Duplicates.

# Comment 27 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Iowa
Last Name: CCI
Email Address: iowacci@iowacci.org
Affiliation:

Subject: LCFS Credits Incentivize More Pollution in Iowa
Comment:

See attachment.

Attachment: www.arb.ca.gov/lists/com-attach/28-dairywkshp220329-ws-WzhTNFUmWGlQCQdk.pdf

Original File Name: CARB comments 4.12.22.pdf

Date and Time Comment Was Submitted: 2022-04-12 10:03:52

No Duplicates.

**Comment 28 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.**

First Name: Julia
Last Name: Levin
Email Address: jlevin@bioenergyca.org
Affiliation: Bioenergy Association of California

Subject: SB 1383 requires inclusion of dairy biomethane in LCFS
Comment:

```
Please see attached comments on the urgency of SLCP reductions and
the requirements in SB 1383 related to dairy biomethane.
```

Attachment: www.arb.ca.gov/lists/com-attach/29-dairywkshp220329-ws-UjBcO1MxAw8Kb1I9.pdf

Original File Name: BAC Comments on Dairy Biomethane.pdf

Date and Time Comment Was Submitted: 2022-04-12 10:06:15

No Duplicates.

**Comment 29 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.**

First Name: Timothy
Last Name: Gibbons
Email Address: timgibbons@morural.org
Affiliation: Missouri Rural Crisis Center

Subject: MRCC Comments--Workshop on Methane, Dairies and Livestock, and Renewable Natural Gas in CA
Comment:

See attached. Thank you for the opportunity to comment.

Attachment: www.arb.ca.gov/lists/com-attach/30-dairywkshp220329-ws-VzoBdQZkAzNRCAZl.pdf

Original File Name: MRCC Comments--Workshop on Methane, Dairies and Livestock, and Renewable Natural Gas in CA--4.12.22.pdf

Date and Time Comment Was Submitted: 2022-04-12 10:26:17

No Duplicates.

# Comment 30 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Armando
Last Name: Ramirez
Email Address: zerimarac@gmail.com
Affiliation:

Subject: Waste = Fuel
Comment:

Reduce Emissions Now and in the Future
More than four of every ten Americans live in communities with dangerously dirty air. According to the American Lung Association, over 135 million people are living in places with unhealthy levels of ozone or particle pollution. And the burden of living with unhealthy air is not shared equally; people of color are over three times more likely to be breathing the most polluted air than white people.1
I urge CARB to continue to support the development of dairy digesters and the use of dairy biomethane in the Low Carbon Fuel Standard and other programs. Reducing methane emissions from dairies is critical to achieve the state's overall climate goals and using that biomethane in heavy duty trucks that replace diesel trucks also provides enormous benefits for air quality. Continuing to support dairy digesters is also required by SB 1383 (Lara, 2016) and multiple other laws in California.
Low NOx engines are proven, cost-effective and available today for medium- and heavy-duty vehicles. Moreover, because RNG is used, life cycle greenhouse gas emissions from low NOx vehicles are reduced further. Fueling with RNG also creates new economic development for energy created from wastewater treatment, landfills, animal waste and other methane sources and significantly increases air quality by reducing the amount of methane released. I strongly believe that RNG-operated low NOx vehicles should not just be "allowed" but must be promoted in the CARB LCFS program if emissions reductions are to occur in any reasonable timeframe. Statutory requirements are pressing on California and CARB needs solutions that work now to decarbonize and clean California's environment. Therefore, I request that RNG-operated low NOx trucks be prominent in CARB's strategies as an immediate pathway to a zero emission future.

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2022-04-12 10:55:43

No Duplicates.

# Comment 31 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Noah
Last Name: Montierth
Email Address: noah.montierth@agrawatt.com
Affiliation:

Subject: In Support of AD of Animal Waste
Comment:

In addition to the attached document which reflects the views of myself and the American Biogas Council, I would like to address the brilliance that is California's LCFS.

California's LCFS is the first market-based regulation that incentivizes clean fuel producers based upon HOW clean the fuel they produce is. This is genius. It has led folks to find an unregulated industry and clean it up. Prescriptive regulations are effective, but they cannot do this. Market-based regulations fill the gaps in prescriptive regulations. To punish clean fuel producers who exploited this opportunity and operate within the scientific, calculated bounds of California's LCFS would be detrimental to the legitimacy of opportunities presented by this, and other market-based regulations.

People quite often neglect the feasibility of biogas-electricity. Unlike RNG, it is favorable for small farms, with less of an incentive to increase the size of the farm. To truly solve the problems I've read through requires that the EPA enable biogas-electricity projects to generate the same D3 RINs. Even with this being said, I encourage you to view the size of dairy farms that have installed an AD system. It surprised me. This is NOT a CAFO driver.

To suggest that biogas subsidizes dairy neglects the mechanisms put in place by CA-LCFS that drive prices down as credit production exceeds deficit production. The dairy opportunities are short-lived. The manure gold rush will be over soon. Let's not over react and destroy this effective regulation.

Attachment: www.arb.ca.gov/lists/com-attach/32-dairywkshp220329-ws-B2lcNVU1UWoCWwFi.pdf

Original File Name: noah_CARB_AD_Livestock.pdf

Date and Time Comment Was Submitted: 2022-04-12 10:49:02

No Duplicates.

# Comment 32 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: David
Last Name: Mann
Email Address: david.mann@oberonfuels.com
Affiliation: Oberon Fuels, Inc.

Subject: Comments on March 29, 2022, Workshop on Methane, Dairies and Livestock, and RNG
Comment:

```
Attached are comments from Oberon Fuels, Inc.
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Attachment: www.arb.ca.gov/lists/com-attach/33-dairywkshp220329-ws-UT5VMQZiUHFVPAhm.pdf

Original File Name: Oberon Fuels Comments on CARB Workshop on Methane Dairies Livestock and RNG April 12 2022.pdf

Date and Time Comment Was Submitted: 2022-04-12 11:54:57

No Duplicates.

**Comment 33 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.**

First Name: Melissa
Last Name: VanOrnum
Email Address: melissav@dvoinc.com
Affiliation:

Subject: DVO Comments on the Workshop on Methane, Dairies, Livestock (dairywkshp220329-ws) and RNG
Comment:

Attachment: www.arb.ca.gov/lists/com-attach/34-dairywkshp220329-ws-Wz9UJFY4WVUCZwRl.pdf

Original File Name: DVO_CARB response_4.12.22.pdf

Date and Time Comment Was Submitted: 2022-04-12 12:59:57

No Duplicates.

## Comment 34 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Hannah
Last Name: Connor
Email Address: hconnor@biologicaldiversity.org
Affiliation: Center for Biological Diversity

Subject: Public Comments on Workshop on Methane, Dairies and Livestock, And Renewable Natural Gas
Comment:

```
Please see attached written comments.

Sincerely,
Hannah Connor
Center for Biological Diversity
```

Attachment: www.arb.ca.gov/lists/com-attach/35-dairywkshp220329-ws-VWcFM1RnUjMAWQk9.pdf

Original File Name: 2022 4 12_Center Comment ISO Petition.pdf

Date and Time Comment Was Submitted: 2022-04-12 13:35:55

No Duplicates.

# Comment 35 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Devyn
Last Name: Hall
Email Address: Devyn@iowacci.org
Affiliation: Iowa CCI

Subject: LCFS Credits Incentivize More Pollution in Iowa
Comment:

See attached PDF.

Attachment: www.arb.ca.gov/lists/com-attach/36-dairywkshp220329-ws-VzQAZwR3ADEAWVU2.pdf

Original File Name: CARB comments 4.12.22.pdf

Date and Time Comment Was Submitted: 2022-04-12 14:30:51

No Duplicates.

# Comment 36 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Andy
Last Name: Foster
Email Address: andy.foster@aemetis.com
Affiliation: Aemetis, Inc.

Subject: Comment on Workshop on Methane, Dairies, Livestock and RNG
Comment:

```
Please see attached document for comments from Aemetis, Inc.
```

Attachment: www.arb.ca.gov/lists/com-attach/37-dairywkshp220329-ws-AGFRMlU5BTMBcwlg.pdf

Original File Name: Aemetis_Comments_CARB Workshop-Petition.pdf

Date and Time Comment Was Submitted: 2022-04-12 14:37:44

No Duplicates.

# Comment 37 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Brian
Last Name: Habersack
Email Address: bhabersack@gasbiz.com
Affiliation: California Energy Exchange

Subject: CARB Response April 2022
Comment:

```
Attached is a response to CARB from California Energy Exchange
Corporation.
```

Attachment: www.arb.ca.gov/lists/com-attach/38-dairywkshp220329-ws-AGNVNlI2UV0EcANm.pdf

Original File Name: CEE Response to CARB - 4-12-22.pdf

Date and Time Comment Was Submitted: 2022-04-12 15:42:52

No Duplicates.

# Comment 38 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Derek
Last Name: Jones
Email Address: djones@gasbiz.com
Affiliation: Energy Operations Management

Subject: CARB Response April 2022
Comment:

```
Attached is a response to CARB from Energy Operations Management.
```

Attachment: www.arb.ca.gov/lists/com-attach/39-dairywkshp220329-ws-BmNdNFI+Aw9SJlM2.pdf

Original File Name: EOM Response to CARB - 4-12-22.pdf

Date and Time Comment Was Submitted: 2022-04-12 15:47:23

No Duplicates.

**Comment 39 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.**

First Name: Sandra
Last Name: Jones
Email Address: dkeelan@gasbiz.com
Affiliation: Sands Resources, Inc.

Subject: CARB Response April 2022
Comment:

```
Attached is a response to CARB from Sands Resources, Inc.
```

Attachment: www.arb.ca.gov/lists/com-attach/40-dairywkshp220329-ws-ViUGYVwzBzBRJAlW.pdf

Original File Name: Sands Response to CARB - 4-12-22.pdf

Date and Time Comment Was Submitted: 2022-04-12 15:48:15

No Duplicates.

# Comment 40 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Jeff
Last Name: Troost
Email Address: milkmantroost@gmail.com
Affiliation:

Subject: Family farms
Comment:

Dear Sirs, I am writing you today as a family dairy farmer. We take our environmental stewardship very seriously and hope that installing a methane digester shows our commitment not only to sustainability but also to preserving our resources for the next generation. Thank you, Jeff Troost

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2022-04-12 16:13:54

No Duplicates.

# Comment 41 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Christine
Last Name: Ball-Blakely
Email Address: cblakely@aldf.org
Affiliation:

Subject: Coalition Comments on Workshop
Comment:

Please see attached.

Attachment: www.arb.ca.gov/lists/com-attach/42-dairywkshp220329-ws-U2ECNFFiWDlXfAAw.pdf

Original File Name: 2022-04-12 - Coalition Comments on Workshop.pdf

Date and Time Comment Was Submitted: 2022-04-12 16:28:29

No Duplicates.

## Comment 42 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Michael
Last Name: Boccadoro
Email Address: mboccadoro@westcoastadvisors.com
Affiliation: Dairy Cares

Subject: Dairy Cares Comments on 3-29-22 Workshop on Methane, Dairies, and RNG in CA
Comment:

```
Please see comments attached.  Thank you.
```

Attachment: www.arb.ca.gov/lists/com-attach/43-dairywkshp220329-ws-BjRSZgY3AmUHMAk7.pdf

Original File Name: 220412 Dairy Cares Comments on Workshop on Methane, Dairies and Livestock, and RNG in CA (00574367-2xBA8E1).pdf

Date and Time Comment Was Submitted: 2022-04-12 17:24:03

No Duplicates.

# Comment 43 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Suzanne
Last Name: Hunt
Email Address: suzanne.hunt@generatecapital.com
Affiliation: Generate Capital, PBC

Subject: Comments regarding the Methane, Dairies and Livestock, and Renewable Natural Gas
Comment:

See letter attached.

Attachment: www.arb.ca.gov/lists/com-attach/44-dairywkshp220329-ws-BWZQN1AjADECWwFt.pdf

Original File Name: CARB Letter 04122022.PDF

Date and Time Comment Was Submitted: 2022-04-12 17:30:07

No Duplicates.

# Comment 44 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Patrick
Last Name: Serfass
Email Address: staff@americanbiogascouncil.org
Affiliation:

Subject: ABC Comments on CARB Workshop on Methane, Dairies and Livestock, and RNG in CA
Comment:

Dear Chair Randolph:

As the voice of the United States biogas industry, we are writing today in response to the Methane, Dairies and Livestock, and Renewable Natural Gas in California Workshop (Workshop) held by the California Air Resources Board (CARB) on March 29. The American Biogas Council (ABC) represents more than 300 and 3,000 professionals throughout the biogas supply chain that are dedicated to recycling organic waste into biogas and soil products.

The ABC applauds CARB on presenting a virtual Workshop that was attended by over 800 people and provided an opportunity for a balanced discussion of the issues around the California Low Carbon Fuel Standard (LCFS) and SB 1383 regulations as they relate to the dairy and livestock industries. It was made clear during the Workshop that reducing methane emissions from dairies and livestock facilities is critical to California achieving its climate goals. One of the keyways for CARB to ensure reduced methane emissions is for CARB to continue to incentivize the development of anaerobic digesters on dairy and livestock facilities as well as support the use of biomethane from these systems in the Low Carbon Fuel Standard (LCFS) and other programs. Not only are anaerobic digesters and related technologies critical to reaching California's climate goals, but continued support of anaerobic digesters on dairies and other livestock operations is also required by Senate Bill 1383 (SB 1383) (Lara, 2016) and multiple other laws in California.

CARB staff presented several times throughout the day on the structure, requirements and results of the program thus far and recently released the last version of the CARB “Analysis of Progress toward Achieving the 2030 Dairy and Livestock Sector Methane Emissions Target” report. According to this analysis the 2030 target of SB 1383 will not be met without continued investment in dairy and livestock sector methane reduction projects. The data indicate that it will cost an estimated $75 million per year to meet the target if the current split between the Alternative Manure Management Program (AMMP) and Dairy Digester Research and Development Program (DDRDP) is maintained.

Throughout the Workshop we heard from commenters and speakers who were opposed to dairy and livestock biogas and suggested that California could become carbon neutral, with clean air, clean water, and provide environmental justice for all Californians without an impact on the dairy and livestock industries. Most of these speakers were associated with the Leadership Counsel for Justice & Accountability and they failed to provide specifics on how California would be able to achieve its climate goals AND maintain the economic vitality and productivity of the dairy and livestock sectors. Rather the commenters and

speakers used generalities to argue against what they consider “factory farms” and “factory farm gas”.

We also heard from several experts working in the biogas industry and at state and federal agencies working closely with the biogas industry. Many of them stated that the LCFS program is working, and with increased support and incentives it will meet the 2030 target of SB 1383 without regulating dairy products and milk, the number one ranked commodity product produced in the state of California or effecting the almost $58 billion economy that California Dairy has created.1
Many of these speakers mentioned that the only proven technology for significantly reducing emissions is anaerobic digestion (AD) and that, where possible, pasture based dairies have already been implemented. They pointed out that the Intergovernmental Panel on Climate Change (IPCC) recognizes AD as the leading technology to address climate change. Dairies have made incredible progress as a sector and AD has been proven to be the most effective solution available today to solve many of the climate-related issues in California.

Sincerely,
Patrick Serfass
Executive Director
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Attachment: www.arb.ca.gov/lists/com-attach/45-dairywkshp220329-ws-UzVXOFwzAjAEbgJj.pdf

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Date and Time Comment Was Submitted: 2022-04-12 17:52:08

No Duplicates.

# Comment 45 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

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Affiliation: American Biogas Council

Subject: ABC Comments on CARB Workshop on Methane, Dairies and Livestock, and RNG in CA
Comment:

4/12/2022

The Honorable Liane Randolph,
Chair
California Air Resources
Board
1001 I Street
Sacramento, CA  95814

<h1 style="margin-bottom: 0in; line-height: 115%;">RE: American Biogas Council CARB Response April
2022</h1>

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The ABC would like to comment specifically on the following issues that were raised during the workshop:

Dairy opponents have submitted a petition to CARB to exclude dairy biomethane from the LCFS.

This petition, if accepted, would clearly violate the following requirements of SB 1383 specific to dairy biomethane:

. The requirement that CARB “develop a pilot financial mechanism to reduce the economic uncertainty associated with the value of environmental credits, including credits pursuant to the Low-Carbon Fuel Standard regulations . . . from dairy-related projects producing low-carbon transportation fuels.”2
. The requirement to adopt a mechanism to provide LCFS credits for 10 years to dairy biomethane producers that begin production before the adoption of dairy methane regulations.3
. The requirement that the California Energy Commission recommend measures to increase the production and use of biomethane, with priority going to “fuels with the greatest greenhouse gas emissions benefits, including the consideration of carbon intensity and reduction in short-lived climate pollutants.”4

Accepting the petition would also violate other California laws calling for in-state biomethane production including:

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AB 1900
(Gatto, 2012) requires that “the commission shall adopt policies and programs that promote the in-state production and distribution of biomethane. The policies and programs shall facilitate the development of a variety of sources of in-state biomethane.”5
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SB 1122
(Rubio, 2012) requires the California Public Utilities Commission (CPUC) to “encourage gas and electrical corporations to develop and offer programs and services to facilitate development of in-state biogas for a broad range of purposes.”6

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AB 2313
(Williams, 2016) requires the CPUC to “consider options to increase in-state biomethane production and use.”7

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SB 840
(Budget, 2016) states that for “California to meet its goals for reducing emissions of greenhouse gasses and short-lived climate pollutants, the state must . . . increase the production and distribution of renewable and low-carbon gas supplies.”8
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SB 1383
(Lara, 2016) requires state agencies to “consider and, as appropriate, adopt policies and incentives to significantly increase the sustainable production and use of renewable gas, including biomethane and biogas.”9 SB 1383 also requires the Commission to “consider additional policies to support the development and use in the state of renewable gas, including biomethane and biogas, that reduce short-lived climate pollutants in the state.”10
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The requirement that the CPUC consider “adopting a biomethane procurement program focused on in-state and delivered biomethane.”11

Not only would accepting the petition be bad policy if one truly wants to make progress on reducing carbon emissions, but there is simply no way to exclude dairy biomethane from the LCFS without violating the unambiguous language and intent of California state law. There is also virtually no way to meet the 40 percent methane reduction target without dairy digesters, which are providing by far the greatest methane reductions of any programs or investments to date.12,13

Biogas systems are the number one technological approach to capturing and utilizing baseline short-lived methane emissions from wastewater and waste solids while also producing renewable energy and fuels for additional greenhouse gas (GHG) reductions from fossil fuel offsets.

According to a December 15, 2021, report “Assessing California's Climate Policies—Agriculture” published by the Legislative Analyst's Office (LAO)14, CARB estimates that all DDRDP projects (including those funded but not yet implemented) will

provide significant GHG reductions totalling 2.1 million metric tons of carbon dioxide equivalents annually. The estimated emission reductions for each project will vary based on several factors, particularly the amount of manure flushed into the digester and the end use of the biogas captured. CARB12,13 estimates that the program reduces emissions at a state cost of $9 per ton, which is one of the lowest costs‑per‑ton estimates among Greenhouse Gas Reduction Fund (GGRF) programs. (For context, allowances under the cap‑and‑trade program—which puts a price on each ton of GHG emissions in the state—sold for about $28 per ton at the November 2021 auction.)

In CARB’s methodology, emission reductions for DDRDP projects come from two major sources. First, estimates include reductions associated with avoided methane emissions – specifically, the methane emissions captured by the digester that otherwise would have been released into the air. According to information provided by CARB, more than 75 percent of the estimated emission reductions are from avoided methane, though the amount can vary depending on the project.

Second, estimates include reductions associated with avoided CO2 emissions, which assume that fossil fuels are displaced by the biogas (and biomethane) produced by a digester. (We note that the combustion of biogas [and biomethane] produces CO2 emissions, but these emissions are not included in the state’s GHG inventory because they are biogenic rather than from fossil fuels.) Given that most digester projects upgrade biogas to biomethane for transportation fuel, avoided CO2 emissions for most projects largely come from the displacement of fossil fuels used in the transportation sector. The current methodology also includes avoiding CO2 emissions for projects that displace fossil fuels in natural gas pipelines and in electricity and heat generation.

Biogas systems, particularly those on dairy and swine farms, have played and are playing a critical and primary role in meeting the State of California and CARB goals related to Short Lived Climate Pollutants. Biogas systems supply low carbon intensity renewable transportation fuel to the LCFS program for mandated and scheduled lowering of carbon footprint of consumed transportation fuel in the state. For California to meet the targeted and scheduled methane reduction goals for dairy farms in the state requires that we utilize the proven and tested technology that AD offers.

The adoption of biogas systems within the LCFS program, both in-state and out-state, and their subsequent critical role in meeting state goals, results from a now proven, LCFS-driven, economic model. This model has allowed for unprecedented private/public/farmer partnerships and allows costs/revenues/risks and viability of project development to be shared. This thriving ecosystem would not function properly if it could only rely on farm investments.

The ultra-low carbon intensity (CI) within the dairy and swine biogas sector is real and well-vetted within the national laboratory-developed Greenhouse Gases, Regulated Emissions, and Energy Use in Technologies (GREET) model. As such, anyone who values science must appreciate their role in meeting GHG and climate goals, and not selectively replace them with non-scientific reasoning.

The low CI of these projects arises from a combination of well-to-wheels carbon gains plus the methane offsets from baseline methane emissions from manure management, storage, and application. Methane offsets from baseline emissions are a legitimate accounting practice as baseline, pre-biogas

systems emissions exist, and are largely removed through the installation of the biogas system.

The United Nation’s IPCC recognizes the methane reduction potential from AD as up to 99 percent15, and that, along with other Waste-to-Energy technologies, if used with appropriate air emissions technology, can produce clean energy. The IPCC acknowledges however, that if not used properly they can exacerbate air quality issues16 and can contribute to fugitive emissions that may reduce GHG reduction benefits17. Appropriately, in developing the LCFS regulation, CARB addressed these potential adverse impacts. Per the LCFS regulation, all projects, including biogas projects, are required to comply with all laws that pertain to them, including those associated with air and water quality. Furthermore, in determining a CI score and having it annually verified by third party auditors, and approved by CARB, dairy and swine biogas projects are required to account for any fugitive emissions that may occur along with the emissions associated with energy inputs necessary to operate the projects.

Some of the language used by those who want to eliminate dairy and livestock sector methane reduction projects is purposefully misleading.

Opposition Claim 1: Dairies and livestock facilities are “Factory Farms” producing “Factory Farm Gas”.

The continual use of the terms “Factory Farm” and “Factory Farm Gas” when referring to larger livestock facilities and the biomethane generated from their AD systems, purposefully mischaracterizes the true nature of these farms. As voiced by the California dairy producers during the comment period of the workshop, the dairies in California, as well as elsewhere in the U.S., are primarily multiple-generation, family-run businesses with a long history of ties to their respective communities. They employ people directly and bring other important jobs, local spending revenues, and valued nutritional products to those communities where they are located, the nation and the world. This can be verified with data from the USDA's National Agricultural Statistics Service (NASS) 2017 Census of Agriculture, which stated that 38,007 of 40,336 dairy farms in the United States are family owned (94.2 percent).18

Texas dairy farmer Sieto Mellema captured the sentiment of many dairy producers when he said that when he looks out among his 3,000 cows and thousands of acres of crops, he does not see a factory. He sees a dairy farm that he and his family run with the utmost care and respect for their animals and their land. “Some people see our farm and they think it’s too big to be normal, so it must be a ‘factory,’” he said. “We do tours here all the time and everyone is astounded with the care we provide our cows. Even people in a rural town like ours (Dalhart) are amazed, so I can see someone in a large city having this mindset. The term factory farm is misleading, but it is just not understanding farming on the part of people who say that. It hurts me to the core to hear my farm called that, but all you can do is educate.”

In addition, according to the U.S. Environmental Protection Agency’s AgSTAR program, of the 317 currently operational biogas systems on farms, there is a wide diversity of farm sizes using biogas systems. Large farms aren’t the only ones using them. Specifically:
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Of the 317 farm-based biogas systems, 265 use dairy manure (84 percent). Of those:

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30 farms have
< 500 cows (11 percent)
.
43 have
500-1,000 cows (16 percent)
.
85 have
1,000-3,000 cows (32 percent)
.
55 have
3,000-10,000 cows (20 percent)
.
11 have
10,000+ cows (4 percent)
.
For 41, no
farm size data are currently available (15 percent)

Oppositional Claim 2: Dairies
and other livestock producers are
polluters.

The family dairies of California adhere
to all sorts of national, state, and local regulations, always
aiming to be good stewards and citizens to the environment and
community. These hardworking, well-meaning families have
demonstrated their willingness to improve the environment by
adopting biogas systems to improve upon their existing stewardship.
While any industry sector or population will have individual
outliers, associating the small number of bad actors with poor
stewardship by the vast majority is disingenuous at best and
inflammatory at worst. The overwhelming percentage of farmers meet
all regulations, which are some of the most stringent in the
country, and are not negligent, lawless, or purposeful
polluters.

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According to
the Innovation Center for U.S. Dairy, the greenhouse gas footprint
of the nation's dairy producers is less than 2 percent of the
nation’s total.19
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Thanks to
improvements in sustainable farming practices, U.S. dairy farmers
are now using 65 percent less water and 90 percent less land to
produce 60 percent more milk.20
.
Thanks to
improved farming practices, the carbon footprint of producing 1
gallon of milk shrunk by 19 percent between 2007 and 2017,
requiring 30 percent less water and 21 percent less
land.20
.
34 dairy
companies representing 75 percent of U.S. milk production have
voluntarily adopted the U.S. Dairy Stewardship Commitment to help
the U.S. dairy industry collectively advance, track and report
progress on social responsibility areas important to consumers,
customers, and communities.21
.
U.S. dairy is
a diverse, complex sector made up of just under 30,000 farms and
hundreds of dairy companies, with representation across the entire
country.22
.
A 2021 World
Wildlife Fund analysis found that U.S. dairy farms could achieve
net zero emissions in as few as 5 years if the right incentives and
supportive policies are put in place. The investment would mean a

return of $1.9 million or more per farm. If even 10% of dairy production in the U.S. were to achieve net zero, GHG emissions could be reduced by more than 100 million tons.23

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A team of Virginia Tech researchers found that the removal of dairy cows from the U.S. agricultural industry would only reduce greenhouse emissions by about 0.7 percent — and it would significantly lower the available supply of essential nutrients for humans.24

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Dairy packs a serious nutrient punch, effectively, efficiently, and affordably providing the annual protein requirements of 169 million people and the annual calcium requirements of over three-quarters of the population.24

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Dairy encompasses the six billion people who eat and drink its products annually, as well as the 600 million people who live and work on the world’s 133 million dairy farms, and the one billion people who rely on the dairy sector to support their livelihoods and communities.25

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In the U.S., there are 280 on-farm anaerobic digester systems used to convert manure into renewable energy. Of those, 77 percent are located on dairy farms.26

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80 percent of what dairy cows consume cannot be eaten by people, including by-products of other foods like citrus pulp and almond hulls.27

Oppositional Claim 3: Programs designed to help pay for the technologies and practices that reduce GHG emissions on livestock operations are subsidies and dairies and other livestock operations should be regulated, not subsidized.

Dairies and livestock operations are already some of the most regulated industries in the country. They are required to meet and maintain compliance with federal, state, and local regulations at all times. Without the current help from California programs, many of the family farms across California would be unable to afford biogas systems and would not be able to capture and reduce the methane emissions created by their farms. Those making this charge believe that all animal agriculture is done at the cost of the environment and the underserved communities around them. This, however, undercuts the economic value of dairy's role in a healthy, sustainable diet and its efforts to strengthen and connect the communities it serves.

Oppositional Claim 4: Dairies are using biogas systems to grow and pollute.

The dairy industry in California has been experiencing consolidation for decades due to the inherent economies of scale in the industry and specifically the necessity to manage costs associated with meeting regulatory standards, and a volatile pricing system where the price farms receive for their milk is often out of their control. The United States Department of Agriculture Economic Research Service (USDA-ERS) recently published a comprehensive analysis of this trend towards consolidation. Put simply, many dairies are getting larger, but this is because larger operations can have more efficiency in production per cow, which results in a lower number of total cows per unit of milk produced. Biogas systems are not the cause of consolidation. Biogas systems

are the best way to lower GHG’s and produce renewable energy for other sectors of the economy.28

In his testimony during the workshop, Dr. Aaron Smith from UC Davis compared the value of producing milk to the value of biogas. Dr. Smith said farmers may consider expanding their herds in order to produce biogas since his analysis concluded that biogas may be worth about half as much as milk when LCFS and renewable identification number (RIN) credits are high. However, his analysis excluded the fact that the farms only receive a portion of the revenue generated from a biogas operation. Most biogas projects are owned and operated in conjunction with companies that have skilled specialties in biogas production. This allows the farmer to reduce financial risk and means the revenue to the farmer is usually much less than Dr. Smith’s analysis showed.

Oppositional Claim 5: The emissions reductions from biogas systems are greenwashing.

Studies have shown that recycling all organic waste and other biomass could lead to renewable natural gas (RNG) production at a scale of approximately 20 percent industrial usage of fossil natural gas and 50 percent of residential use. This is not an insignificant fraction of the natural gas consumption. In addition, many gas utilities, like Southern Company, National Grid, SoCalGas, and others, are implementing plans to aggressively reduce the amount of gas needed to meet residential and industrial needs. This means that, in combination with increased efficiency, RNG and hydrogen, will actually be able to meet even larger percentages of gas use with renewable gas. Similar to California’s vision for decarbonization, Europe is embracing a similar vision through their Renewable Energy Directive, or “RED II”, with a target of 32 percent renewable energy supply by 2030.

Professor and Cooperative Extension Air Quality Specialist at the University of California, Davis, Dr. Frank Mitloehner recently commented in a Clarity and Leadership for Environmental Awareness and Research at UC Davis article that he is “...always flabbergasted when [he sees] actual methane reductions hinted at as ‘greenwashing.’ Digesters have been one of the most effective tools in curbing carbon emissions from animal agriculture and even displacing some fossil fuel use in California.”29

The net benefit of methane capture using digester systems is clear from a scientific basis, as evidenced in the carbon intensity (CI) score derived from avoided life cycle GHG emissions. It is unjustified to infer that leakage compromises this value proposition at farm-scale installations, while most of the concern focuses on household-scale digesters and not commercial installations.30

It is recognized that scientific characterization of total emissions from dairy digester systems is neither comprehensive nor do these studies suggest a systemic problem. One study focused on emissions from UK biogas plants discussed results from measurements of only ten digester systems31 with almost half demonstrating emissions rates that are less than 2 percent of total production. Another study by the International Energy Association found that cross-comparison was difficult between different methodologies while acknowledging that episodic events may compromise measurement of average annual emissions calculations.32 Meanwhile, this synthesis study shared results collected using thirteen measurement methods with an average of 2-3 percent loss versus total production.

It is likely that implementation of best

practices across the global biogas industry, from development and routine inspection procedures, may result in leak rates on the lower end of these studies (<2 percent). Furthermore, high RNG product commodity values, driven by the RIN and LCFS markets, encourage operators to adopt best practices with respect to leak detection and mitigation to maximize throughput.

Oppositional Claim 6: Methane leakage from the natural gas pipeline system makes the use of renewable natural gas more harmful than the benefit it provides.

While it is true that there is leakage in any industrial processing, including biogas, it is important to note that studies show this to be within 0-15 percent, with agricultural biogas facilities on the low end at approximately 2 percent. Also, CARB already incorporates this into their carbon accounting using GREET analyses.33 More importantly, we can assume that without biogas systems, the baseline is 100 percent methane released into the atmosphere. Therefore, it is more accurate to not criticize a 2 percent loss but applaud a 98 percent capture and conversion. Furthermore, in generating LCFS credits, projects must account for any methane venting events which occur during operations.

According to published data for the United States, methane emissions from conventional natural gas distribution mains account for 32 percent of the industry's total methane emissions. It is believed that cast iron pipelines contribute the most to these emissions, even though they represent only 3 percent of the miles of all U.S. distribution mains. These estimates are based on national methane leak rates from an EPA-funded study which estimated emissions from all sources in the U.S. natural gas industry.34

Since 1992 the EPA has gathered over 100 companies to participate in their Natural Gas Star Program, a voluntary program intended to reduce the amount of methane leakage from distribution pipe systems. In 1997, because of the Star Program, the U.S. Environmental Protection Agency EPA released a report which indicated that a potential increase in natural gas sales would increase methane output by 0.5 to 1 percent annually. Using 1992 as their baseline, the EPA estimated that 1.4 percent (plus or minus 0.5 percent) of all gas that travels through pipes in the United States was emitted. Overall, of all the methane released by industry in the United States, 20 percent of methane comes from the natural gas sector. Landfills contribute the most with 31 percent.35

In the same report, the EPA stated that of the methane released by the natural gas industry, 37 percent comes from "Transmission/Storage", 24 percent comes from "Distribution" and 27 percent comes from “Production”. The EPA noted that during summer peak times, emissions were estimated to the highest. The study, contrary to the more recent findings by a Greenpeace funded study in Europe, argues that using estimated emissions from 1992, the natural gas sector emits less greenhouse gas emissions than coal or oil.36 Currently it is estimated that 2 percent of total greenhouse gas emissions come from the country's natural gas industry. In 2006, the natural gas industry operated over 38,000 miles of natural gas pipelines that were made of cast iron, the leakiest of all types of gas piping. In 2009, 4,000 miles of new pipes were laid.37

Further studies of methane gas loss rates need to be completed to assess the situation globally. Assessing these loss rates will help reduce methane leaks from natural gas distribution in the United States.38

Biogas systems are a valuable tool, but not a panacea to solve all of the problems related to manure management.

Biogas systems are at their heart a biological means to convert carbon into methane and capture it for use as a renewable fuel. This process specifically decreases baseline methane emission into the atmosphere by converting the methane back into carbon dioxide. Although they store waste, reduce odor, and make subsequent treatment much easier – the digester itself is not designed nor functions as a nutrient treatment system. Anaerobic digesters are an essential part of livestock manure management systems but are not designed to be replacements for proper nutrient management.

Digesters rely on biological processes to break down biological material. Any biological system has inherent variability, making each digester unique in its operation and performance. This is influenced by feedstock, weather and of course, management. Digesters are flow-through components of a manure management system, linking collection and storage. Too often people look at them as storage systems only or as complete treatment systems that solve every problem, neither of which is true.

Biogas systems prevent the release of methane from uncovered lagoons and lead to a direct reduction in GHG. A well-designed biogas system can capture as much as 80 percent of the methane that would be produced from a waste stream that was maintained at 100 degrees F. Even once cooled down, the emissions from the digestate are not of significant quantity.

Biogas systems are also highly effective at reducing odors, via the biological conversion of odor-causing volatile organic acids to biogas. “Using volatile fatty acids (VFA) as an indicator, anaerobic digestion exhibited an effective reduction of dairy manure odor offensiveness." Page et al (2015) based this conclusion on a laboratory experiment that considered four specific volatile fatty acid concentrations over time for manure before and after digestion, and a reduction in total VFA by 86–96 percent.39

Treatment through anaerobic digestion can reduce the number of pathogens within the manure and therefore limit the number of pathogens entering the environment. Anaerobic digestion of manure has a pathogen reducing effect with as much as 95-98 percent of common pathogens eliminated in mesophilic (~ 100 degrees Fahrenheit) digesters. The reduction in pathogens has the potential to be of benefit for: manure application in impaired watersheds when trying to manage certain pathogens such as Mycobacterium paratuberculosis (MAP or Johne’s) or Salmonella, and when considering a community-based anaerobic digester where manure from multiple farms is combined, treated, and AD solids and AD effluent returned to the farms.40

Partial conversion of organic forms of macro-nutrients to inorganic forms such as organic-P and organic-N to inorganic forms such as phosphates and ammonia produces a product (digestate) that we perceive to be uniquely different than raw manures, and which hold potential for either equal or improved nutrient and crop management when managed and applied correctly.

Biogas systems also play a potential positive role in improving air quality by reducing the hydrogen sulfide (H2S) released to air as compared to a non-AD baseline. While the AD process produces H2S, biogas systems, with their air permits, practice near total control and conversion of the H2S to less innocuous

forms.

In addition to the above-mentioned benefits, biogas systems do not play a role, positive or negative, in nitrate production and release concerns or phosphate release and eutrophication concerns.

As evidenced by the Workshop testimony from Newtrient’s Mark Stoermann, the core biogas system can serve to produce a differentiated digestate wastewater which can utilize add-on technologies and assist in more efficiently operating those add-on technologies for alleviation of nutrient concerns that are not otherwise in the purview of the AD process.

In closing, we would like to present some direct quotes and evidence of global support for biogas system use as a tool to address the GHG emission problem:

According to the United Nations, UN Environment Programme (UNEP) and Climate & Clean Air Coalition (CCAC) “... tackling methane emissions is the most immediate and cost-effective way to avert climate catastrophe, while identifying AD as a readily available low-cost technology that can help reduce these emissions.”41

The European Union Methane Strategy highlights control of methane emissions as vital to meeting continental and global climate goals with the strategy proposing enhanced and targeted support for acceleration of biogas projects and biogas markets as major drivers for achieving their goals.42

The International Energy Agency says that the case for biogas and biomethane lies at the intersection of two critical challenges of modern life: dealing with the increasing amount of organic waste that is produced by modern societies and economies, and the imperative to reduce global greenhouse gas (GHG) emissions.43

By turning organic waste into a renewable energy resource, the production of biogas or biomethane offers a window into a world in which resources are continuously used and reused, and one in which rising demand for energy services can be met while also delivering wider environmental benefits. In assessing the prospects for “organic growth” of biogas and biomethane, the International Energy Agency (IEA) notes the expansive role AD and biogas can play in the transformation of the global energy system.43

The White House Office of Domestic Climate Policy, in their report on U.S. methane emissions reduction action plan, emphasizes the vital role anaerobic digestion, biogas, and associated markets will play in the reduction plan, particularly as it relates to the U.S. agricultural industry and the USDA.44

U.S. EPA flatly states that “AD [is] a common-sense technology to reduce methane emissions.”45

And finally, two quotes from Professor and Cooperative Extension Air Quality Specialist at the University of California, Davis, Dr. Frank Mitloehner, may be the best way to end these comments, as ABC cannot emphasize agreement strongly enough:

“In the race to slow climate change and reduce California’s methane emissions to 40% below

2013 levels by 2030, transforming methane from manure into biogas with digesters leads all other initiatives.”46

“In California, digesters are REDUCING emissions at an incredibly cost-effective rate. Digesters have reduced 30% of the GHGs mitigated in the California Climate Investment initiative with less than 2% of state funding.”47

The American Biogas Council would like to thank you for the opportunity to comment and for the excellent work that CARB is doing in leading the way in reducing the impact of short-lived climate pollutants for California and the entire nation.

Sincerely,
Patrick Serfass
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staff@americanbiogascouncil.org

References

1
University of California, Agricultural Issues Center. (2019). Contributions of the California Dairy Industry to the California Economy in 2018. https://aic.ucdavis.edu/wp-content/uploads/2019/07/CMAB-Economic-Impact-Report_final.pdf
2
Health & Safety Code section 39730.7(d)(1)(B).
3
Health & Safety Code section 39730.7(e).
4
Health & Safety Code section 39730.8(e).
5 AB 1900 (Gatto, 2012) adding Section 399.24(a) to the Public Utilities Code.
6 SB 1122 (Rubio), Statutes of 2012, Chapter 612, codified at Public

Utilities Code § 399.20(f)(2)(D).
7
Public Utilities Code § 784.2.
8
Senate Bill 840 (Budget), Statutes of 2016, SEC. 10, §§
(b) – (i).
9
Health and Safety Code 39730.8(c).
10
Health and Safety Code 39730.8(d).
11 Public Utilities code section 651(b).
12
California Climate Investments. (2021). 2021 Mid-Year Data
Update.
https://ww2.arb.ca.gov/sites/default/files/auction-
proceeds/cci_2021mydu_cumulativeoutcomessummarytable.pdf

13
California Climate Investments. (2021). 2021 Annual
Report.
14
Legislative Analyst’s Office (LAO). (2021). Assessing
California’s Climate Policies—Agriculture. Patek.

https://lao.ca.gov/Publications/Report/4483
15
IPCC, 2021: Climate Change 2021: The Physical Science
Basis. Contribution of Working
Group I to the Sixth Assessment Report of
the Intergovernmental Panel on Climate Change. (Table 11.3 page
11-57). [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C.
Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis,
M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T.
Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)].
Cambridge University Press. In Press. https://www.ipcc.ch/report/ar6/wg1/
16
IPCC, 2021: Climate Change 2021: The Physical Science
Basis. Contribution of Working
Group I to the Sixth Assessment Report of
the Intergovernmental Panel on Climate Change. (Pg 6-47).
[Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C.
Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis,
M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T.
Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)].
Cambridge University Press. In Press. https://www.ipcc.ch/report/ar6/wg1/
17
IPCC, 2021: Climate Change 2021: The Physical Science
Basis. Contribution of Working
Group I to the Sixth Assessment Report of
the Intergovernmental Panel on Climate Change. (Pg 6-47).
[Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C.
Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis,
M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T.
Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)].
Cambridge University Press. 11In Press. https://www.ipcc.ch/report/ar6/wg1/
18
USDA, National Agricultural Statistics Service. (2019). 2017
Census of Agriculture.
https://www.nass.usda.gov/Publications/AgCensus/2017/index.php
19
International Dairy Journal. Thoma et al. (2013).
Greenhouse gas emissions from milk production and consumption in
the
United States: A cradle-to-grave life
cycle assessment circa 2008 (31, S3-S14) https://dx.doi.org/10.1016/j.idairyj.2012.08.013
20
Journal of Animal Science. Capper, Cady, and Bauman.
(2009). The environmental impact of dairy production: 1944

compared with 2007 (87:6,

2160–2167). https://doi.org/10.2527/jas.2009-1781
21
Journal of Animal Science. Capper and Cady. (2020). The effects of improved performance in the U.S. dairy cattle

industry on environmental impacts between 2007 and 2017 (98:1). https://doi.org/10.1093/jas/skz291
22
USDA, National Agricultural Statistics Service. (2022) Milk Production (P.18) https://usda.library.cornell.edu/concern/publications/h989r321c
23
WWF. Devine. (2021). Tackling Scope 3 Emissions and Reaching Net Zero in Dairy. https://www.worldwildlife.org/blogs/sustainability-works/posts/tackling-scope-3-emissions-and-reaching-net-zero-in-dairy
24
Journal of Dairy Science. Liebe, Hall and White. (2020). Contributions of dairy products to environmental impacts and

nutritional supplies from United States agriculture (103:11, 10867-10881). https://doi.org/10.3168/jds.2020-18570
25
Global Dairy Platform. (2020). Driving Development and Self-Reliant Inclusive Economies. https://www.globaldairyplatform.com/development/
26
EPA - AgStar. (2022). https://www.epa.gov/agstar/livestock-anaerobic-digester-database
27
Innovation Center for U.S. Dairy. Tricarico. (2016). Role of Dairy Cattle in Converting Feed to Food. https://docs.wixstatic.com/ugd/36a444_d950ca21aca54a9e92d4be516cad4998.pdf
28
U.S. Department of Agriculture, Economic Research Service. Njuki. (2022). Sources, Trends, and Drivers of U.S. Dairy

Productivity and Efficiency. https://www.ers.usda.gov/publications/pub-details/?pubid=103300
29
Twitter (@GHGGuru). Mitloehner. (2022). “I am always flabbergasted when I see actual methane reductions hinted at as

“greenwashing….” https://twitter.com/ghgguru/status/1484317713233108999?s=10&t=0CTf1Fzl0cgVKDZb4hSNFw
30
Searchinger et al. (2021). Opportunities to Reduce Methane Emissions from Global Agriculture. https://scholar.princeton.edu/sites/default/files/methane_discussion_paper_nov_2021.pdf
31
Waste Management. Bakkaloglu et al. (2021) Quantification of methane emissions from UK biogas plants. (124, 82-93).

https://doi.org/10.1016/j.wasman.2021.01.011
32
IEA Bioenergy. Liebetrau et al. (2017). Methane Emissions from Biogas Plants: Methods for Measurement Results and

Effect on Greenhouse Gas Balance of Electricity Produced. https://www.ieabioenergy.com/blog/publications/methane-emissions-from-biogas-plants-methods-for-measurement-results-and-effect-on-greenhouse-gas-balance-of-electricity-produced/
33
U.S. Energy Information Administration. (2022). Frequently Asked Questions. https://www.eia.gov/tools/faqs/index.php#naturalgas
34
Pipeline and Gas Journal. Bylin, et al. (2009). New Measurement Data Has Implications for Quantifying Natural Gas

Losses From Cast Iron Distribution Mains.

https://www.epa.gov/natural-gas-star-program/new-measurement-data-has-implications-quantifying-natural-gas-losses-cast
35
U.S. Environmental Protection Agency. (1996). Methane Emissions from the Natural Gas Industry. https://www.epa.gov/natural-gas-star-program/methane-emissions-natural-gas-industry
36
U.S. Environmental Protection Agency. (2008). Reduction Opportunities for Local Distribution Companies.
37
New York Times. Revkin and Krauss. (2009). Curbing Emissions by Sealing Gas Leaks. https://www.nytimes.com/2009/10/15/business/energy-environment/15degrees.html
38
U.S. Environmental Protection Agency. (2008). Natural Gas STAR: Methane Emission Reduction Opportunities for Local

Distribution Companies.
39
Biosystems Engineering. Page et al. (2014). Characteristics of volatile fatty acids in stored dairy manure before and after anaerobic digestion. (118,16-28). https://doi.org/10.1016/j.biosystemseng.2013.11.004
40
Livestock and Poultry Environmental Learning Community. Saunders and Harrison. (2019). Pathogen Reduction in Anaerobic Digestion of Manure. https://lpelc.org/pathogen-reduction-in-anaerobic-digestion-of-manure/
41
United Nations Environment Programme. (2021). Global Methane Assessment: Benefits and Costs of Mitigating Methane Emissions. https://www.unep.org/resources/report/global-methane-assessment-benefits-and-costs-mitigating-methane-emissions
42
European Commission. (2020). Reducing greenhouse gas emissions: Commission adopts EU Methane Strategy as part of European Green Deal. https://ec.europa.eu/commission/presscorner/detail/en/ip_20_1833
43
IEA. (2020). Outlook for biogas and biomethane: Prospects for organic growth. https://www.iea.org/reports/outlook-for-biogas-and-biomethane-prospects-for-organic-growth
44
The White House. (2021). U.S. Methane Emissions Reduction Action Plan. https://www.whitehouse.gov/wp-content/uploads/2021/11/US-Methane-Emissions-Reduction-Action-Plan-1.pdf
45
World Biogas Association. (2021). World Biogas Association at COP26: “Anaerobic digestion a key technology to reduce methane emissions and fulfill Global Methane Pledge.” https://www.worldbiogasassociation.org/world-biogas-association-at-cop26-anaerobic-digestion-a-key-technology-to-reduce-methane-emissions-and-fulfill-global-methane-pledge/#:~:text=The%20US%20Environmental%20Protection%20Agency,in%20the%20EU's%20methane%20strategy.
46
Clear Center. Mitloehner (2022). No BS – Dairy Digesters Work. https://clear.ucdavis.edu/blog/no-bs-dairy-digesters-work
47
Twitter (@GHGGuru). Mitloehner. (2022). “In California, digesters are REDUCING emissions….” https://twitter.com/ghgguru/status/1484317714889916418?s=10&t=0CTf1Fzl0cgVKDZb4hSNFw

Attachment: www.arb.ca.gov/lists/com-attach/46-dairywkshp220329-ws-WjwGaVU6V2VXPQRl.pdf

Original File Name: FINALAmericanBiogasCouncil-CARB-Response-APR2022 .pdf

Date and Time Comment Was Submitted: 2022-04-12 17:59:17

No Duplicates.

# Comment 46 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Bryan
Last Name: Sievers
Email Address: bryan.sievers@gmail.com
Affiliation: Sievers Family Farms

Subject: Response from an Iowa livestock producer and anaerobic digester operator
Comment:

We are forwarding, as an attachment, a response to the Methane, Dairies and Livestock, and Renewable Natural Gas in California Workshop held on March 29, 2022. Thank you for all you're doing to help improve the sustainability of agriculture while allowing farmers and food producers throughout the United States help meet California's air quality goals!

Sincerely,
Bryan and Lisa Sievers
26618 20th Avenue
Stockton, Iowa 52769

Attachment: www.arb.ca.gov/lists/com-attach/47-dairywkshp220329-ws-UCNRPlUxV3IEZwFz.docx

Original File Name: Sievers_CARB_Response_04122022_FINAL.docx

Date and Time Comment Was Submitted: 2022-04-12 17:54:34

No Duplicates.

# Comment 47 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Patrick
Last Name: Wood
Email Address: patrick@agmethaneadvisors.com
Affiliation:

Subject: Comments on 3/29/22 Workshop
Comment:

```
Please find our comments attached.  Thank you!
```

Attachment: www.arb.ca.gov/lists/com-attach/48-dairywkshp220329-ws-AGFQMQNvADZQIglh.pdf

Original File Name: AgMethane_Comments Re March 2022 Dairy Methane Emissions wksp_4.12.22.pdf

Date and Time Comment Was Submitted: 2022-04-12 18:42:51

No Duplicates.

## Comment 48 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Ashley
Last Name: Remillard
Email Address: ashley.remillard@hexagonagility.com
Affiliation: Hexagon Agility

Subject: Hexagon Agility Comments on the RNG Imperative for California’s Transportation Sector
Comment:

```
Please see attached for Hexagon Agility's comments on the RNG
Imperative for California's Transportation Sector.
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Attachment: www.arb.ca.gov/lists/com-attach/49-dairywkshp220329-ws-WzMHZFQtU2FQMVM8.pdf

Original File Name: Hexagon Agility - Letter to CARB re LCFS.pdf

Date and Time Comment Was Submitted: 2022-04-12 18:31:51

No Duplicates.

# Comment 49 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Manuel
Last Name: Monteiro
Email Address: Endeavor95@gmail.com
Affiliation: Lakeside Dairy

Subject: LFCS
Comment:

To whom it may concern, my name is Manuel Monteiro, my brother and I own Lakeside Dairy. We are third generation Dairyfarmers from Tulare and Kings County. I operate an anaerobic digester on our Dairy facility. In order to capture the methane on our Dairy we had to spend several million dollars building our facility which we had to borrow the money from a local bank to build. The local bank was only willing to loan us the money because they believed We had an income stream from The LCFS credits to pay the loan back. Without the LCFS program we would never been able to build the Digester and capture the methane gas from our Dairy facility

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2022-04-12 18:59:14

No Duplicates.

# Comment 50 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Jarrell
Last Name: Cook
Email Address: jarrell@resolutecompany.com
Affiliation: California Natural Gas Vehicle Coalition

Subject: CNGVC Support for CARB’s Continued Inclusion of All Low Carbon Fuel Sources in the LCFS
Comment:

Dear Chair Randolph:

The California Natural Gas Vehicle Coalition (CNGVC) writes to express our strong support for the California Air Resources Board (CARB)'s decision to reject counterproductive changes to the Low Carbon Fuel Standards (LCFS) that would have excluded biomethane from the program. We concur that such action would make it exceptionally difficult for California to reach transportation decarbonization.

The U.N.'s Intergovernmental Panel on Climate Change warns that we must limit the planet's warming to 1.5 degrees Celsius to avoid irreversible, catastrophic climate change. Reducing methane emissions--the world's second-most-abundant greenhouse gas (GHG) and a potent Short-Lived-Climate-Pollutant (SLCP), is key to achieving this outcome. Methane is 80 times more powerful than carbon dioxide in trapping heat in our atmosphere, even though methane only remains in the environment for a fraction of the time. Therefore, we must prioritize methane reductions in order to immediately slow global warming and exceed the internationally recognized warming limit.

As the world searches for an effective means to capture and reuse methane, California's LCFS program is successfully working as intended to achieve this goal.  As such, it remains a primary driver for major reductions and continues to serve as a model for other state, federal, and international proposals to achieve greater results.  Given the program's success and the persistent need to combat the disastrous changes to our climate, CNGVC strongly encourages CARB to not only reject imposing fuel preferences, but also work to increase support for the production of all low-carbon fuels that meet the program's criteria for negative carbon intensity.

As a technology-neutral program, the LCFS reflects a commitment to an "all-hands-on-deck" approach to reducing emissions, with California's farmers, automakers, fuel producers, goods movers, and environmental advocates all working together to combat climate change and clean our air. The program represents a critical component to CARB's transportation decarbonization strategy through the production of renewable natural gas (RNG) and we encourage you to maintain its current technology neutral, standards-based approach.

The LCFS is effectively incenting the reductions of GHGs and reducing the climate impact of the dairy and swine farming industry and producing low carbon fuels. The LCFS encourages the capture of fugitive methane emissions derived from agricultural waste. When seized, this waste is converted from a toxic pollutant into a valuable low-carbon fuel source: RNG.  Even the byproducts of RNG processing--nutrient-rich solids and liquids--have value as a fertilizer. Producing RNG from organic waste sources provides an

opportunity to double our emissions reduction impact by capturing the methane that would have otherwise been emitted into the atmosphere and then using it as a tool to eliminate future emissions.

Renewable natural gas (RNG) derived from organic waste is critical in the fight against climate change. The transportation sector is California's largest source of carbon dioxide, including Short-Lived Climate Pollutants, contributing over a third of the state's GHG emissions. Slashing SLCP emissions immediately is necessary to prevent the irreparable warming of the planet past the point of catastrophe. Diesel fuel is a major source of black carbon, and the overwhelming majority of medium and heavy-duty trucks on California's highways are powered by diesel fuel. Displacing diesel trucks and eliminating their emissions is the fastest and most effective way meaningfully reduce SCLPs.

RNG-fueled low NOx trucks are the cleanest technology available today that can be deployed as a 1-for-1 replacement of diesel-powered trucks. Nothing can reduce black carbon more effectively than renewable fuels that displace diesel. Low NOx trucks, fueled by RNG, are certified by CARB as 90% cleaner than today's certified diesel and diesel particulate matter is reduced 100% by trucks that run on this renewable fuel. CNGVC believes our state's top priority for combating climate change should be the rapid reduction of SCLP in the near-term.

Carbon negative fuel sources, and near-zero emission vehicles, that use them are critical tools to reduce emissions and combat climate change. The growing consensus among scientists and advocates combating climate change is that we must go beyond reducing emissions to achieve our global reduction targets; we must transition into policies prioritizing net negative emissions to avert dangerous levels of climate change.

Based on CARB data, natural gas (RNG and fossil) was on average a -28.17 gCO2e/MJ, which makes natural gas used as a transportation fuel the only negative carbon intensity fuel and the lowest carbon fuel under the LCFS. Additionally, low NOx trucks are the only transportation technology available and ready to be deployed today that delivers less than zero GHG emissions and RNG is the only transportation fuel that has achieved this distinction to date.

CNGVC is a diverse coalition of engine and vehicle manufacturers, fleet operators, utilities, and renewable fuel providers whose sole focus is the reduction of criteria, toxic and greenhouse gas pollutant emissions from the heavy-duty transportation sector.  We are dedicated to the advancement of low NOx trucks powered by carbon-negative renewable natural gas (RNG) as a proven solution to immediately help the State realize its decarbonization goals.

For these reasons, CNGVC asks that CARB retain the LCFS as a technology-neutral program that prioritizes the developing and deploying of the cleanest available fuels to decarbonize California's transportation sector. We believe RNG and the sources that can be used to produce it are a vital tool in the state's fight to reduce emissions and improve air quality. Feel free to contact me at nicolerice@cngvc.org if you have any questions regarding our position.

Respectfully,

Nicole Rice, President, CNGVC

Attachment: www.arb.ca.gov/lists/com-attach/51-dairywkshp220329-ws-BWZROQFnVHFSN1IN.pdf

Original File Name: CNGVC -- CARB LCFS Letter FINAL  041222.pdf

Date and Time Comment Was Submitted: 2022-04-12 19:57:33

No Duplicates.

# Comment 51 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Jarrell
Last Name: Cook
Email Address: jarrell@resolutecompany.com
Affiliation: California Natural Gas Vehicle Coalition

Subject: CNGVC Support for CARB’s Continued Inclusion of All Low Carbon Fuel Sources in the LCFS
Comment:

Dear Chair Randolph:
The California Natural Gas Vehicle Coalition (CNGVC) writes to express our strong support for the California Air Resources Board (CARB)’s decision to reject counterproductive changes to the Low Carbon Fuel Standards (LCFS) that would have excluded biomethane from the program. We concur that such action would make it exceptionally difficult for California to reach transportation decarbonization.
The U.N.’s Intergovernmental Panel on Climate Change warns that we must limit the planet’s warming to 1.5 degrees Celsius to avoid irreversible, catastrophic climate change. Reducing methane emissions—the world’s second-most-abundant greenhouse gas (GHG) and a potent Short-Lived-Climate-Pollutant (SLCP), is key to achieving this outcome. Methane is 80 times more powerful than carbon dioxide in trapping heat in our atmosphere, even though methane only remains in the environment for a fraction of the time. Therefore, we must prioritize methane reductions in order to immediately slow global warming and exceed the internationally recognized warming limit.
As the world searches for an effective means to capture and reuse methane, California’s LCFS program is successfully working as intended to achieve this goal.  As such, it remains a primary driver for major reductions and continues to serve as a model for other state, federal, and international proposals to achieve greater results.
Given the program’s success and the persistent need to combat the disastrous changes to our climate, CNGVC strongly encourages CARB to not only reject imposing fuel preferences, but also work to increase support for the production of all low-carbon fuels that meet the program’s criteria for negative carbon intensity.
As a technology-neutral program, the LCFS reflects a commitment to an “all-hands-on-deck” approach to reducing emissions, with California’s farmers, automakers, fuel producers, goods movers, and environmental advocates all working together to combat climate change and clean our air. The program represents a critical component to CARB’s transportation decarbonization strategy through the production of renewable natural gas (RNG) and we encourage you to maintain its current technology neutral, standards-based approach.
The LCFS is effectively incenting the reductions of GHGs and reducing the climate impact of the dairy and swine farming industry and producing low carbon fuels. The LCFS encourages the capture of fugitive methane emissions derived from agricultural waste. When seized, this waste is converted from a toxic pollutant into a valuable low-carbon fuel source: RNG.  Even the byproducts of RNG processing—nutrient-rich solids and liquids—have value as a fertilizer. Producing RNG from

organic waste sources provides an opportunity to double our emissions reduction impact by capturing the methane that would have otherwise been emitted into the atmosphere and then using it as a tool to eliminate future emissions.

Renewable natural gas (RNG) derived from organic waste is critical in the fight against climate change. The transportation sector is California’s largest source of carbon dioxide, including Short-Lived Climate Pollutants, contributing over a third of the state’s GHG emissions. Slashing SLCP emissions immediately is necessary to prevent the irreparable warming of the planet past the point of catastrophe. Diesel fuel is a major source of black carbon, and the overwhelming majority of medium and heavy-duty trucks on California’s highways are powered by diesel fuel. Displacing diesel trucks and eliminating their emissions is the fastest and most effective way meaningfully reduce SCLPs.

RNG-fueled low NOx trucks are the cleanest technology available today that can be deployed as a 1-for-1 replacement of diesel-powered trucks. Nothing can reduce black carbon more effectively than renewable fuels that displace diesel. Low NOx trucks, fueled by RNG, are certified by CARB as 90% cleaner than today’s certified diesel and diesel particulate matter is reduced 100% by trucks that run on this renewable fuel. CNGVC believes our state’s top priority for combating climate change should be the rapid reduction of SCLP in the near-term.

Carbon negative fuel sources, and near-zero emission vehicles, that use them are critical tools to reduce emissions and combat climate change. The growing consensus among scientists and advocates combating climate change is that we must go beyond reducing emissions to achieve our global reduction targets; we must transition into policies prioritizing net negative emissions to avert dangerous levels of climate change.

Based on CARB data, natural gas (RNG and fossil) was on average a -28.17 gCO2e/MJ, which makes natural gas used as a transportation fuel the only negative carbon intensity fuel and the lowest carbon fuel under the LCFS. Additionally, low NOx trucks are the only transportation technology available and ready to be deployed today that delivers less than zero GHG emissions and RNG is the only transportation fuel that has achieved this distinction to date.

CNGVC is a diverse coalition of engine and vehicle manufacturers, fleet operators, utilities, and renewable fuel providers whose sole focus is the reduction of criteria, toxic and greenhouse gas pollutant emissions from the heavy-duty transportation sector.

We are dedicated to the advancement of low NOx trucks powered by carbon-negative renewable natural gas (RNG) as a proven solution to immediately help the State realize its decarbonization goals.

For these reasons, CNGVC asks that CARB retain the LCFS as a technology-neutral program that prioritizes the developing and deploying of the cleanest available fuels to decarbonize California’s transportation sector. We believe RNG and the sources that can be used to produce it are a vital tool in the state’s fight to reduce emissions and improve air quality. Feel free to contact me at nicolerice@cngvc.org if you have any questions regarding our position.

Attachment: www.arb.ca.gov/lists/com-attach/52-dairywkshp220329-ws-UjFcNAZgBSACZ1IN.pdf

Original File Name: CNGVC -- CARB LCFS Letter FINAL  041222.pdf

Date and Time Comment Was Submitted: 2022-04-12 20:02:03

No Duplicates.

## Comment 52 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Clifford
Last Name: Gladstein
Email Address: cliff@gladstein.org
Affiliation:

Subject: Comments on March 29th Workshop
Comment:

```
Please find attached the comments of our stakeholder group in
support of ARB and continued inclusion of dairy biomethane in the
LCFS. Thank you for this opportunity.
```

Attachment: www.arb.ca.gov/lists/com-attach/53-dairywkshp220329-ws-AmFUPVY6UG4EZwRq.pdf

Original File Name: Comments to ARB on the March 29 2022 Dairy RNG Workshop v4-12-22.pdf

Date and Time Comment Was Submitted: 2022-04-12 21:08:50

No Duplicates.

## Comment 53 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Thomas
Last Name: Spangler
Email Address: thomas@cleanbayrenewables.com
Affiliation:

Subject: AgLand Renewables Comments
Comment:

```
See attached letter.
```

Attachment: www.arb.ca.gov/lists/com-attach/54-dairywkshp220329-ws-UTBSM1Y7WGpQOAdj.pdf

Original File Name: AgLand ARB Comment Letter_April2022.pdf

Date and Time Comment Was Submitted: 2022-04-12 21:17:21

No Duplicates.

**Comment 54 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.**

First Name: Chad
Last Name: Frahm
Email Address: chad.frahm@brightmark.com
Affiliation: Brightmark

Subject: Comments from Brightmark
Comment:

Attachment: www.arb.ca.gov/lists/com-attach/55-dairywkshp220329-ws-B2UAdFQ8VGAKZFIm.pdf

Original File Name: Brightmark Comment to CARB Workshop-Methane, Dairies and Livestock, and Renewable Natural Gas.pdf

Date and Time Comment Was Submitted: 2022-04-12 21:35:11

No Duplicates.

**Comment 55 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.**

First Name: William
Last Name: Graham
Email Address: bill@5energiesresources.com
Affiliation:

Subject: Letter in Support of Retaining Dairy-Derived RNG in the LCFS Program
Comment:

```
See letter of support attached
```

Attachment: www.arb.ca.gov/lists/com-attach/56-dairywkshp220329-ws-WzcFZlciBSIAYwJw.pdf

Original File Name: Letter of Dairy Biomethane Support to CARB 041222.pdf

Date and Time Comment Was Submitted: 2022-04-12 22:06:56

No Duplicates.

## Comment 56 for Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) - 1st Workshop.

First Name: Nathalie
Last Name: Hoffman
Email Address: nhoffman@LCFSConsulting.com
Affiliation: LCFS Consulting Services, Inc.

Subject: Comments relating to the March 29 2022 workshop on the anaerobic digestion of dairy manure
Comment:

```
Attached are my comments on the March 29 2022 workshop dairy manure
AD.

Nathalie Hoffman
CEO, LCFS Consulting Services, Inc.
Los Angeles, CA
```

Attachment: www.arb.ca.gov/lists/com-attach/57-dairywkshp220329-ws-BmVcNVQ4UG4AYwln.docx

Original File Name: Comments on March 29 2022 CARB workshop on dairy manure AD 04 12 22.docx

Date and Time Comment Was Submitted: 2022-04-12 23:30:28

No Duplicates.

**There are no comments posted to Comment docket for March 29, 2022 workshop on dairies (dairywkshp220329-ws) that were presented during the Workshop at this time.**