SANDS RESOURCES, INC.

April 12, 2022

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

RE: CARB Response April 2022

Dear Chair Randolph:

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:

2981 Gold Canal Drive, Rancho Cordova, California 95670 Phone 916-859-4710 Fax 916-859-4747

- 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 <u>number one</u> 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. CARB[12,13] 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 CO_2 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 CO_2 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 CO_2 emissions for most projects largely come from the displacement of fossil fuels used in the transportation sector. The current methodology also includes avoiding CO_2 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 percent[15], 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 issues[16] and can contribute to fugitive emissions that may reduce GHG reduction benefits[17]. 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 systems[31] 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]

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,

Sandra Jones
President

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