CALIFORNIA BIOENERGY
Plugging dairies into a renewable future.

May 26, 2016

The Honorable Mary Nichols, Chair
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: Comments on Proposed Short-Lived Climate Pollutant Reduction Strategy (April 2016 Draft)

Dear Chair Nichols:

Thank you for the opportunity to provide comments for the Proposed Short Lived Climate Pollutants (SLCP) Strategy. California Bioenergy LLC ("CalBio") was formed nine years ago with the goal of designing and developing dairy digesters in the Central Valley of California in order to reduce Greenhouse Gas emissions. CalBio is committed to advancing dairy participation in renewable compressed natural gas (R-CNG) programs, and dedicates a substantial portion of its resources to this effort. In addition to destroying methane, dairy digester projects that produce R-CNG offer the potential to reduce NOx by replacing diesel trucks. Dairy digester projects in addition, whether R-CNG or electricity-generating facilities, also enhance water protection by replacing currently unlined lagoons and create local jobs.

In November 2015, CalBio as part of its R-CNG initiatives submitted, with ARB's assistance, the Carbon Intensity ("CI") application for its Kern County dairy digester cluster project[1]. The approval of this LCFS pathway application marks the first CI pathway approved for dairy digesters. The pathway contemplates multiple on-dairy methane capture digesters (a biogas control system or "BCS") being constructed with the captured biogas being reticulated on public and private land via low pressure pipelines to a central gas conditioning, compression and pipeline interconnect facility. In addition, CalBio submitted a proposal for the Kern cluster project to the California Sustainable Freight Action Plan Pilot Project Ideas Request, and it is one of the three finalists in the Draft Sustainable Freight Action Plan. These two steps reflect the effort and commitment CalBio has to producing R-CNG.

It is CalBio's CI pathway that is referenced in the Draft SLCP strategy and that appears crucial to ARB's economic analysis of digester projects under the SLCP Strategy. A "key" innovation in

[1] Method 2B Application: Prospective Pathway Dairy Biogas to CNG California Bioenergy LLC ("CalBio") Bakersfield, CA. (Pathway Code: CNG056); CNG056, 2B Application-Dairy Biogas to CNG (accounting for avoided methane) Carbon Intensity Values (g CO2e./MJ) = -276.2

ARB's evaluation and final approval of CalBio's R-CNG prospective pathway was the utilization of ARB's "Compliance Offset Protocol, Livestock Projects, Capturing and Destroying Methane from Manure Management Systems Adopted: November 14, 2014" to quantify the prospective greenhouse gas emission reductions associated with the installation of the BCS for manure management on dairy farms that would otherwise be venting methane into the atmosphere as a result of the livestock operations. This Protocol is thoroughly vetted as part of the AB 32 legislation and requires extensive third party verification and ARB approval each year before the additional and voluntary methane reductions are approved as offsets. Once the reductions meet all necessary protocol requirements and receive the relevant approvals they are issued as Registry Offset Credits ("ROCs") that can then be converted into ARB Offset Credits or (but not both) be utilized in the LCFS program.

The crucial point is that vast majority of LCFS CI value comes from the ability to document the carbon benefits utilizing ARB's Livestock Protocol. If biogas control systems are mandated on dairies, or if AB32 is not extended beyond 2020, or if the crediting period for ARB offset projects becomes limited to one term rather than two then the potential economic value for dairy biogas as a LCFS fuel disappears or diminished. These actions would cause the CI value to become similar to a landfill biogas fuel where municipal taxes and trash collection fees have already fully paid for the landfill BCS. Unfortunately the new and incremental cost of building and operating dairy BCS systems, gathering lines, conditioning systems and interconnect facilities is substantial and that without the ability to create dairy BCS offsets these projects appear uneconomic. A mandate on dairies to implement BCS eliminates the ability to create ROCs and places a vast portion of the economic cost of the BCS on the dairy. Many dairies would likely close and leave the California taking their methane emissions with them.

CalBio's Kern County R-CNG cluster is only viable if multiple dairies participate in order that an economic scale can be achieved. California has a handful of large clusters of dairies close to natural gas pipelines. CalBio estimates that for these dairy R-CNG clusters to become operational will cost $50 million to $100 million. Over time, with experience, and the successful implementation of the LCFS program, we anticipate the needed scale will decrease in size. However, ARB's SLCP strategy does not fully factor in the costs and revenues, significantly coming from the carbon credit component, needed to make such a project financially viable, nor the risks associated with the LCFS program discussed in more detail below.

While there are only 14 active dairy digesters in California, CalBio, along with the nascent yet emerging digester industry of farmers, producers, trade associations, vendors, other developers, banks and equity providers, is focused on building hundreds of viable digesters over the next 5 to 10 years to capture currently vented methane and use it beneficially.

However, a carefully thought out plan needs to be developed and executed on in order to achieve the shared goals of ARB and the emerging dairy digester industry. This plan needs to advance R-CNG, through the LCFS program, but must also recognize that significant investment needs to be made in the LCFS program immediately to enable it to play a leading and central role. As discussed below, we believe it will take roughly three years before the R-CNG projects can be the central focus, and it will require significant program development and advancement over these years.

The current limitations of the LCFS include the following five issues:

1. The program isn't permanent and it faces political opposition. The risk that LCFS credits could go away prevents the relevant parties from committing to LCFS projects. Banks and investors will not take the risk of a project collapse. Neither will farmers or developers.

2. Even if the program is made permanent the price uncertainty will similarly discourage investment. The price is very high today, but it was roughly 25% of the value a little over a year ago, and such fluctuations create too much uncertainty for the development of projects.

   These two issues can be addressed in various ways. One possible path which has been discussed is the state providing a guarantee purchase of the LCFS credit at a floor price if the program where to end and/or the price falls below a certain threshold. However, figuring out and implementing such a program, likely through legislation, may take one to three years.

3. There is no experience with R-CNG projects at a commercial scale in California and no projects are putting dairy methane into the pipeline. Experience is critical to prove viability both to the farmer's willingness to commit their manure-fuel and the lenders and investors interested in committing financing. The State of California creates additional hurdles given its stringent requirements on methane injection into pipelines.

   This lack of experience can be overcome with the near-term funding and build out of the Kern County Cluster via the Sustainable Freight Action Plan. However, at the quickest it will likely take 18 months. And with the additional regulatory barriers discussed below could take substantially longer.

4. Regulatory Compliance: A key issue that needs to be fixed involves regulatory compliance for ARB Compliance Offset Projects. As mentioned the vast majority of the value of the LCFS credit for dairy digester R-CNG projects is from the carbon credit component in the Carbon Intensity calculation. It is critical that the Cap and Trade Regulation and the Compliance Livestock Protocol are reviewed, interpreted, and revised, to make certain that projects do not lose carbon credits based either on (a) permitting violations that are out of the project's control (such as a day-to-day minor permit issue at a farm supplying the manure and unrelated to methane destruction project) or (b) minor permitting violations that are limited in duration and/or have no material adverse impact. Given the regulations within which projects operate, it is reasonable to expect that from time to time they will be out of compliance despite diligent efforts. When any business is out of compliance they must remedy the problem, working closely the responsible agency and paying a fine if one is issued. Taking such corrective action should be completely sufficient. The risk of loss of some or potentially all credits (or all of the credit portion of the LCFS) will prevent project financing to get the project started.

This is a critical issue to resolve for both electricity and R-CNG projects, but it is of even greater consequences for R-CNG since the credits are a larger portion of the revenue stream. In electricity projects electricity sales are *roughly* 80% of revenues and carbon credits roughly 20%. For R-CNG the numbers are the opposite with *roughly* 20% of revenues from the sale of the CNG and 80% from the credits (LCFS credits and RINs).

5. Carbon credits: It is essential that carbon credits are maintained. As many people have raised in ARB's various public meetings about the DRAFT SLCP strategy, the loss of carbon credit revenues would have debilitating consequences. To maintain the currently projected economics, the recommended $100 million per year of grant funding would likely need to be doubled. Further, without adequate incentives, there would be a movement of dairies out of state, resulting in both the loss of a portion of an important industry and the continued GHG emissions from the relocated dairies. Furthermore, California's cap and trade and LCFS programs result in GHG reductions from livestock across North America. Eliminating carbon credits will result in the increase of emissions across the continent, nullifying an important environmental accomplishment. Finally, it is also important to note that the loss of the carbon credit for the LCFS calculation would likely destroy the economic advantage of R-CNG projects over electricity projects.

A well thought-out plan is needed to tackle dairy methane in a public/private partnership. CalBio and other developers would like to contribute to this effort. It is important to recognize the good news, that a great deal of knowledge has been learned over the past decade. The key steps to success are clear, accomplishable and relatively few. Potential plan components are outlined below and the critical, near-term role of electricity needs to be harnessed.

Two Phases

I. Phase 1: 2.5 Years 2016 – 2018.

There are three components:

A. Advance Electricity Projects

Given the current and significant barriers to R-CNG projects as outlined above, electricity projects are the key to near-term reduction of dairy lagoon methane. The driver for wide-scale electricity projects in turn is the SB1122 Bioenergy Market Adjusting Tariff ("BioMAT Tariff"). However, the BioMAT has failed to date and it needs to be fixed.

- The program began about 1.5 years late.
- Since the program begin on February 1, 2016 no dairy projects have taken BioMAT contracts since the price is too low.
    - The PUC commissioned-study, conducted by Black &Veatch, determined that a price of approximate 22 cents to 35 cents (low end to high end) per kWh was needed without grants or carbon credits to provide viable economics for dairy digester projects. CDFA/GGRF grant funding, along the match rules of last year's program, and carbon credits, at current prices, would result in a reduced price of

18 cents to 19 cents per kWh, averaging the low and medium Black & Veatch modeled scenarios.
    - However, the CPUC started the program at 12.7 cents.
- This low price, along with the high entry costs into the BioMAT queue, has vastly discouraged program participation. Only two projects have entered and as a result the price has not moved.
- The solution is simple: the starting price needs to be increased.
- ARB, along with Governor's office, need to encourage the PUC to immediately reset the starting price using similar action as the emergency program action taken for forest biomass or alternatively immediately work with legislature and revise the SB 1122 language.
- With a higher price CalBio anticipates from various developers and farmers 10 to 15 signed BioMAT contracts over FY 16-17, reflecting CDFA grant funding for FY 15-16 and FY 16-17 and estimates 20 or more additional projects entered into the queue in this same time period.
- The BioMAT is also important for advancing dairy experience with the LCFS program. CalBio won a grant to combine electricity sales with LCFS credit sales. Electricity sales provides the long-term viability to balance the risks of the current LCFS program. This is a complex and costly approach but helps provide the critical near-term experience. However, this effort is being slowed by the current status of the BioMAT.
- Also during this initial Phase 1, the industry will gain significant experience in NOx management helping driving down NOx emission levels below the significant advancements made over the past five years.
- The BioMAT is the interim program that will create the dairy biogas industry of farmers, developers, vendors, lenders, and investors, that will begin reduction of GHG emissions. It will also result, over time, in the creation of a cost curve, reducing needed prices. But this later issue should not be the focus since time and experience are needed. Gaining such experience and achieving GHG reductions are the relevant areas of focus.

B. Invest in Initial R-CNG Projects

CalBio's Kern County Cluster, a finalist in the Sustainable Freight Action Plan, needs funding in order for it to be built and experience gained for the industry. The proposed project aggregates the biogas from digesters planned on twelve dairies in roughly a seven-mile radius. One project, has already been built and is currently generating electricity. Two others have received grant funding. While aggregating dairies is a more complex process (complicating project development and financing) than individual projects, it also results in economies of scale unique to R-CNG projects. Support by the state of additional R-CNG project advancement would also be helpful for the nascent industry.

C. Resolve the Regulatory Issues

It is critical to the advancement of dairy digester projects that the LCFS regulatory framework is advanced and secured over the next two years. As discussed above these issues include:

- LCFS program certainty and/or a guaranteed price floor and long-term contract period
- Solving the current risks resulting from the current Regulatory Compliance language in the Cap and Trade Program and associated offset protocols.
- Providing clarity and certainty that carbon credits will not be taken away for projects built before 2025.

These core advancements along with the learning from the Kern cluster are critical to advance to Phase 2.

II. Phase 2: 7 Years 2019 – 2025

With the success of Phase 1, Phase 2 can begin soon – as early as three years from now. During this phase there would be:

- Wide-scale R-CNG fuel project development, utilizing the LCFS program and, if it survives, the federal RIN program. Assuming the LCFS price remains at the current price, once the issues outlined above are solved for, farmers and developers will change their efforts to fuel.
- Electricity project development but on a secondary level – limited to more remote dairies, where pipeline access and/or aggregation do not make sense.

Other Topics

ARB separately raised issues involving digester technologies and water issues. CalBio is committed to helping advance these topics. It has been involved in the only conversion from flush to scrape for a dairy digester in California. However, it believes it is too early to advance any specific technology solutions and also believes solutions will be site specific. For instance, over the past nine years it has learned that there are important environmental and cost advantages for lagoon digesters in many situations. While CalBio is limiting its Comments on this topic at this time, it is dedicated to advancing the study of the digestate effluent from lagoon digesters. Early data indicates it is more plant absorbable, decreasing the potential for leaching. In addition, it is potentially a better starting point for use in drip irrigation systems, which will be an important part of water-limited dairy farm irrigation systems in the future. Similarly, it is dedicated to advancing the learning of how to solve for problems with tank digester effluent to make the movement of nitrogen a cost effective process. It further sees potential benefits at vacuumed and scrape dairies of plug-flow technologies.

In Conclusion

A significant reduction of dairy generated methane over the next ten years is very achievable if the right program is put into place over the next six months. ARB has done extraordinary work. CalBio is dedicated to helping in this initiative along with its partners and other industry participants.

Thank you for the opportunity to submit these comments.

Sincerely,

Neil Black
President