June 30, 2023

Mark Sippola, Ph.D.
California Air Resources Board (CARB)
1001 I Street
Sacramento, CA 95814

Re: Renewable Fuels through SB 596

Dear Dr. Sippola:

Thank you for the opportunity to comment on the May 31, 2023, SB 596 Cement Sector Net-Zero Emissions workshop. We strongly support SB 596 and commend CARB's efforts in addressing greenhouse gas emissions and recognizing the need for innovative approaches to reduce the carbon footprint of the cement industry. In particular, we support and recognize SB 596 and CARB's related efforts to increase the use of biogas in the industrial sector. We urge you, through the SB 596 framework and related rulemakings such as Cap-and-Trade, to develop mechanisms that support the expanded use of biogas in hard-to-abate sectors like cement.

About Ductor

Ductor was founded in 2009 with the ambitious aim of creating a solution that would help solve today's environmental challenges in the energy and agriculture sector. Today we build, own, and operate turnkey microbiological facilities, turning organic resources from the agricultural sector into sustainable fertilizers and biogas. With two plants in Mexico and Germany and numerous projects in the pipeline, including in the U.S. and California, we are living up to our purpose and unlocking bio-resources to make food sustainable and energy clean.

Ductor's technology transforms nitrogen-rich organic resources from agriculture, aquaculture, and other organic origins into renewable energy and fertilizers. We specialize in feedstock that cannot be used directly in conventional anaerobic digestion and biogas facilities. This feedstock is fed into the Ductor pre-process, where an IP-protected consortium of microorganisms and the IP-protected Ductor process converts them via fermentation and subsequent ammonia recovery into organic and sustainable liquid nitrogen fertilizer. The feedstock is further processed in the anaerobic digestation stage of the facility to generate biogas, which is upgraded to pipeline quality. The digestate is further processed into fertilizing and soil-improving products.

Ductor's technology targets the poultry sector, which is growing globally to meet the increasing demand for white meat and egg products. Driven by population growth, urbanization, and rising incomes, global per-capita consumption of poultry meat increased from 3.1 kg to 15 kg between 1964 and 2013, while global per-capita consumption of eggs grew from 4.7 kg to 9.2 kg. The poultry sector generates a large quantity of litter consisting of manure, egg wash water, waste bedding, waste food, and feathers. The amount of litter depends on the frequency of the removal of litter, which varies from country to country. According to USDA, in the United States, as much as 1.4 billion tons of manure is produced by the 9.8 billion heads of livestock and poultry produced yearly. Due to growing environmental and social concerns associated with poultry litter management, storage, land application, and its associated emissions, alternative treatment options are becoming much more attractive and required.

CARB should identify mechanisms to support the use of biogas in the cement sector in its SB 596 strategy.

Biogas, derived from organic waste, offers a renewable and low-carbon alternative to traditional fossil fuels. By utilizing biogas in cement production, emissions can be significantly reduced while simultaneously addressing waste management challenges, including from poultry manure. However, biogas projects - especially those from manure-based feedstocks, which may provide the greatest emissions benefits due to their reduction of potent methane and N_2O emissions - remain expensive on a volumetric basis and require incentives to help develop and compete with other forms of biogas, such as from landfills.

The Low Carbon Fuel Standard (LCFS) has proven a successful model for developing biogas supplies from a broad array of sources and for use in the transportation sector. CARB should work to develop similar mechanisms and incentives to develop biogas projects to supply cement and other industrial facilities that rely on liquid and gaseous fuels to produce high temperature heat and cannot be easily electrified. Ductor encourages CARB to identify strategies in the SB 596 strategy to support the use of biogas at cement facilities, which may include:

- Financial incentives, such as grants or tax credits, to biogas companies that supply cement plants with renewable biogas,
- Regulatory requirements, such as a low carbon fuel standard or renewable gas standard for use in industry,
- Leveraging the current LCFS and allowing cement facilities to opt-in to the program, to create value from their use of biogas or other renewable fuels, or
- Utilizing Cap-and-Trade allowances to help support the use of biogas in cement plants and accelerate decarbonization of the industrial sector.

We also encourage CARB to begin supporting programs and incentives for the use of renewable fertilizers, which will help to support biogas-related projects and reduce incentives and revenues needed from energy sales or climate markets to help projects pencil. Developing domestic supplies of renewable fertilizers will help to decarbonize agriculture and support a

sustainable food system, while mitigating the volatility of global fertilizer markets and price spikes.

CARB should support incentives for biogas from all manure types, including poultry manure, and account for avoided N_2O emissions (in addition to avoided methane emissions).

Ductor has been actively participating in CARB's LCFS amendment process, and strongly supports strengthening the program and maintaining the program's technology-neutral approach to support the widest array of low carbon fuels and emission reduction opportunities. Through that process, we have consistently urged CARB to increasingly consider poultry manure pathways alongside those from other sources, such as dairy manure and swine manure. While those other pathways provide significant, low-cost climate benefits by avoiding potent methane emissions, poultry manure pathways similarly avoid potent N_2O emissions, which are about 300 times more impactful on global warming than CO_2 over 100 years, and more than 10 times more impactful even than methane. We encourage CARB to increasingly incorporate accounting of avoided N_2O emissions into its climate change programs, including the LCFS and Tier 1 calculators, as well as other programs designed to leverage and/or support the development and use of biogas in the cement and other sectors.

In particular, learning from the LCFS, we encourage CARB to consider the following as it looks to support the use of biogas in the industrial sector:

- Set strong and ambitious climate targets, in line with state goals and the 2022 Scoping Plan, that presume success in rapidly developing projects to decarbonize industry
- Avoid changes to market rules, and specifically biogas crediting schemes, that can lead to credit or biogas energy price spikes and hinder investment in expanding the biogas industry.
- As with the LCFS, allow the use of book-and-claim to facilitate development of biogas projects and opportunities to fuel switch and reduce emissions in the cement sector.
- Ensure that avoided methane emissions continue to be fully and completely valued in climate programs and calculators, and similarly fully and completely value avoided N_2O emissions in climate programs and calculators, considering all steps of the business as usual poultry manure management practices.

Thinking holistically about CARB's programs

Finally, we recognize this is a very busy time for CARB, with regulations and planning for the state's largest climate programs open for amendments and planning. We strongly urge you to consider these programs and developments altogether - and in particular, to consider industrial decarbonization efforts and mechanisms in the context of SB 596 and the Cap-and-Trade program holistically. By incorporating incentives for biogas development within the net-zero emissions strategy for the cement sector - as well as the Cap-and-Trade program for industrial use more broadly - California can simultaneously address greenhouse gas emissions, promote renewable energy and fertilizer, and support the growth of the biogas industry in line with the

state’s climate objectives. This approach aligns with the state's broader goals of achieving a sustainable, resilient, decarbonized - and ultimately - carbon neutral and negative-carbon economy.

Thank you again for the opportunity to comment on the workshop. We appreciate your work during this busy time and support CARB’s efforts to create a strong, net-zero cement strategy that will serve as a driver of innovation and greenhouse gas reductions, including from pathways that address one of the most potent and intractable climate change challenges – N_2O emissions. We look forward to continuing to engage in this process and related forums at CARB, and please do not hesitate to ever reach out with any questions about Ductor or these comments.

Sincerely,

Bernard C. Fenner
CEO, Ductor Corporation
President, Ductor Americas, LLC