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July 12, 2023

Dr. Cheryl Laskowski  
California Air Resources Board  
1001 I Street Sacramento, CA

RE: Comments from iogen on the Draft Tier 1 Calculator: Potential Changes to the Low Carbon Fuel Standard Program for Biomethane from Anaerobic Digestion of Dairy and Swine Manure

Dear Dr. Laskowski:

On behalf of iogen, we would like to thank California's Air Resource Board (CARB) for the opportunity to comment on updated Tier 1 calculator for biomethane from anaerobic digestion of dairy and swine manure. We share your commitment to accurate carbon intensity calculations and provide the following revisions for consideration.

We are one of the world's leading firms in the field of low carbon cellulosic biofuels. We have been in the cellulosic biofuel business for over 30 years, invested roughly \$500 million in research, development and demonstration and have more than 300 issued and pending patents. We have implemented our cellulosic ethanol production technology in Brazil at Raizen Energia's 10 million gallon per year Costa Pinto Facility, which is now producing cellulosic ethanol from bagasse. Seven more facilities are being developed using iogen's technology. We are also very active in the deployment of biogas-derived fuels in the U.S. and around the world. We are currently using about 30 million gallons per year (ethanol equivalent) of renewable natural gas to make fuel serving diverse markets, including California.

We have reviewed the new Tier 1 calculator for dairy and swine manure and would like to thank the agency for its work to make these necessary clarifications and corrections to the calculations and its work to add inputs that are common for dairies.

We would like to provide the following brief edits to the draft calculator:

- On the Pathway Summary tab, cell A48 is labelled as "Natural Gas (Gas Btu Enhancement)", but the equation in cell B48 refers to cell S52 on the Biogas-to-RNG tab, which is an electricity usage. We believe the equation in B48 should be referring to cell V52.



- On the Avoided Emissions tab, the formatting of cell C47 should be changed to a percentage, as opposed to a decimal.

Additionally, the instructions for the provision for lagoon cleanouts may be unclear. On page 7 of the instruction manual and in the row labeled L1.(1-6).14 Retention Time and Drainage, the instruction indicates to select the applicable option for each month, and then also states for every September you must select "System Emptied this Month". It is our understanding that for sites which had no full cleanouts in their baseline, they would need to add a September cleanout, and these instructions make that clear. However, it is unclear for sites which have full cleanouts already whether they will need to add another one on top of the existing cleanout. For example, if a dairy had one full cleanout every October in their baseline, these instructions would imply they need to show a cleanout in October, and also in every September. We seek clarity from the agency in these instructions on whether the intention was only to add a September cleanout if one did not already exist or add a September cleanout in addition to an existing one.

We at iogen appreciate the opportunity to provide feedback on this topic during the LCFS amendment process. We welcome the opportunity to discuss any of our comments further or provide any clarifications necessary.

Sincerely,

A handwritten signature in blue ink, appearing to read "Patrick Foody", written over a faint, stylized blue line graphic.

**Patrick Foody**

Chief Development Officer

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