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*Comment Received From: Graham Noyes*  
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## **Fulcrum BioEnergy Comment RE 1383 Joint Agency Workshop**

Attached please find the comment of Fulcrum BioEnergy. Please contact me regarding any questions regarding this comment.

Best Regards,

Graham  
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*Additional submitted attachment is included below.*



July 12, 2017

Chair Robert B. Weisenmiller  
California Energy Commission  
1516 Ninth Street  
Sacramento, CA 95814

(Comment submitted electronically to Docket No. 17-IEPR-10 )

RE: Joint Agency Workshop on Renewable Gas under SB 1383

Dear Chair Weisenmiller,

Fulcrum BioEnergy, Inc. (“Fulcrum”) appreciates the opportunity to provide further comments regarding the Joint Agency Workshop on Renewable Gas and SB 1383 (“Workshop”). Bruno Miller, Managing Director of Fuels at Fulcrum, had the opportunity to serve as a panelist on the Emerging Technologies Panel at the Workshop.

Fulcrum is a world leader in the production of low carbon fuels from post-separated municipal solid waste (“Separated MSW”). Fulcrum’s projects will reduce the release of the short-lived climate pollutant (“SLCP”) methane, as the facilities will utilize Separated MSW to produce transportation fuels. Fulcrum can provide an informed business perspective on how California can accelerate the commercialization and deployment of SLCP-reducing low carbon fuel production technologies.

#### Summary Recommendations

Fulcrum is highly supportive of California’s policies to reduce greenhouse gas (“GHG”) emissions, and the specific provisions contained in SB 1383 to reduce SLCP’s in an immediate and systematic fashion. California’s policies and particularly the Low Carbon Fuel Standard (“LCFS”) have been highly successful in stimulating demand for low carbon fuels. However, California’s policies have been less successful in stimulating the development of low carbon fuel production facilities in California. To achieve the SLCP-reducing goals of SB 1383 and reap the job and economic benefits of producing low carbon fuels in state, Fulcrum recommends that the involved state agencies continue to work closely with the low carbon fuels industry to find practical ways to resolve key hurdles. These hurdles include: the state’s uniquely stringent specification for renewable natural gas; the high cost of interconnection; the difficulty and delays of permitting; uncertainty regarding LCFS credit values; and the lack of objective, performance based standards to enable the development of gasification and other environmentally sound advanced technologies.



### Fulcrum’s Next Generation Biofuel Processing Technology

Fulcrum is the parent company of Fulcrum Sierra BioFuels, LLC (“Sierra BioFuels”). Sierra BioFuels is constructing and will own and operate a commercial scale low carbon fuel production facility comprised of a Feedstock Processing Facility and a Biorefinery (together the “Sierra BioFuels Plant”). The Feedstock Processing Facility is operational and is located near the Lockwood Regional Landfill in Storey County, Nevada. The Feedstock Processing Facility receives Separated MSW that would otherwise be landfilled. A sophisticated feedstock processing system shreds, screens, and sorts the MSW producing a MSW-derived feedstock. The resulting products from the Feedstock Processing Facility include the MSW-derived feedstock and recoverable materials with market value (e.g. ferrous and nonferrous metals and high value plastics).

The Biorefinery is to be located approximately 20 miles east of Reno in the Tahoe-Reno Industrial Center. The Biorefinery will utilize the MSW-derived feedstock to produce very low carbon fuel that is anticipated to meet ARB’s stringent future standard for low emission diesel fuel when upgraded to diesel. The Biorefinery will have the flexibility to convert the MSW-derived feedstock into very low carbon bio-crude, diesel and, jet fuel using a three-step process comprised of steam reformation, Fischer-Tropsch (“FT”) synthesis, and hydroprocessing.

### Fulcrum’s Status Under the LCFS

Fulcrum was successful in obtaining approval for a Prospective Pathway using the CA-GREET 1.8b model under the prior LCFS regulation. Specifically, Fulcrum obtained a pathway for Fischer-Tropsch (“FT”) diesel via gasification and FT synthesis of MSW (Pathway Code: FTD 001). Subsequently, ARB re-certified Fulcrum’s pathway under CA-GREET 2.0 with a CI score of 14.78. Thus Fulcrum’s FT diesel produced from Separated MSW has been found by ARB to reduce GHG’s by approximately 85% when compared to conventional diesel fuel.

ARB’s approval of Fulcrum’s Prospective Pathway approval and re-certification of the FTD 001 pathway was valuable in facilitating the financing of the Sierra BioFuels Plant. Fulcrum’s Prospective Pathway is highly important to investors and impacts the facility’s financial projections because Fulcrum’s CI score of 14.78 will provide more than \$1.00 of LCFS credit value per gallon in the current LCFS credit market of approximately \$80 per MT.

Fulcrum would like to acknowledge the importance of the personnel and resources that ARB dedicates to the LCFS program, and the importance of the FT diesel pathway to the



deployment of Fulcrum's technology to produce low carbon transportation fuels from Separated MSW.

### Co-Processing of Fulcrum Bio-crude at California Refineries

Tesoro has announced its intent to utilize Fulcrum's very low carbon intensity bio-crude at its Martinez Refinery as a replacement for conventional crude oil.<sup>1</sup> Upon delivery to Tesoro, Fulcrum's bio-crude will directly displace high CI fossil crude and lower the CI of the gasoline and diesel fuels that Tesoro supplies to the marketplace. Given the production capacity of Tesoro's refining operations, this supply agreement enables Fulcrum to rapidly increase supply of a low carbon fuel without encountering the distribution challenges that alternative fuels must typically overcome.

### Planned Development of California Facilities

Fulcrum is a California based company with headquarters in Pleasanton. Fulcrum has plans to develop facilities in the San Francisco and Los Angeles metropolitan areas. However, these facilities currently face a series of costs and barriers that render the development of low carbon fuel facilities in California more difficult than in other states. California's leadership in GHG reduction programs including particularly the LCFS has established the most robust set of low carbon fuel demand policies in the country. Unfortunately, there has been no corresponding set of initiatives to facilitate the production of these fuels. As a result, California has missed out on the job and economic opportunities that the low carbon fuels industry presents. ARB tracks and reports the portion of LCFS fuels produced in California. In state production has consistently been in the range of only 11-15% of California low carbon fuel demand with a current downward trend. Though the LCFS requires more than one billion gasoline gallon equivalents per year, only 211 million of these GGE's were produced in California in 2016.<sup>2</sup>

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<sup>1</sup> Kristen Hays, Reuters Commodities, Tesoro working with partners to run crude in U.S. made from

<sup>2</sup> See ARB's LCFS data dashboard website at <https://www.arb.ca.gov/fuels/lcfs/dashboard/dashboard.htm> , TAB 10, for additional detail.



## Waste Diversion

As part of California's overall SLCP strategy, the State has established aggressive requirements and reporting obligations relating to the diversion of waste and particularly organics. In the waste industry, these requirements will have a significant impact on the market economics of collected material. In particular, material that is placed in a landfill or other location categorized as "disposal" will become increasingly disfavored and expensive to the disposer, while material that is utilized in a manner qualifying as diversion will have more favorable economics.

AB 901 establishes the classification and reporting scheme for California. CalRecycle has undertaken a rulemaking to establish the AB 901 regulatory structure. Fulcrum has been an active participant in this process, and has engaged in a constructive dialogue with the agency. From Fulcrum's perspective, CalRecycle has faced challenges in developing a viable regulatory structure to facilitate diversion and environmentally favorable utilization of materials due to the existing dysfunctional legal framework. However, CalRecycle has made significant efforts to maximize intelligent uses of materials for fuel and energy within the limits of this framework. Fulcrum has appreciated the opportunity to provide input to this process, and CalRecycle's efforts in this regard.

## Gasification

For a variety of historical reasons, California has developed a waste treatment and diversion policy framework that prohibits some methods that could otherwise reduce the methane released from MSW. In particular, existing policies preclude the in-state development of gasification techniques that would otherwise better enable the state to achieve its SB 1383 goals while maintaining air, water and soil quality, and attaining renewable energy standards.

These ambitious goals and standards can be met by leveraging California's innovative companies engaged in the clean energy economy but only to the extent that the state is willing to embrace technology neutral performance requirements rather than definitions that favor particular industries or categorically prohibit technologies. Perhaps the clearest example of this bias is provided by the impossible standard imposed on MSW to qualify under the state's renewable portfolio standard:



*(b) "Municipal solid waste conversion," as used in subdivision (a), means a technology that uses a noncombustion thermal process to convert solid waste to a clean-burning fuel for the purpose of generating electricity, and that meets all of the following criteria:*

*(1) The technology does not use air or oxygen in the conversion process, except ambient air to maintain temperature control.*

*(2) The technology produces no discharges of air contaminants or emissions, including greenhouse gases as defined in Section 38505 of the Health and Safety Code.*

*(3) The technology produces no discharges to surface or groundwaters of the state.*

*(4) The technology produces no hazardous wastes.*

*(5) To the maximum extent feasible, the technology removes all recyclable materials and marketable green waste compostable materials from the solid waste stream prior to the conversion process and the owner or operator of the facility certifies that those materials will be recycled or composted.<sup>3</sup>*

*(...)*

In order to achieve the level of SLCP reduction from landfills required by SB 1383, California's policy structure will need to evolve to enable existing and future technologies that are capable of converting MSW to energy and fuel without harmful environmental impact. This substantial policy undertaking will require the active and supportive engagement of all of the agencies that participated in the Joint Agency Workshop on Renewable Gas under SB 1383, along with other key stakeholders.

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<sup>3</sup> Public Resources Code §25741(b)(1)-(5).



### Conclusion

SB 1383 requires extremely aggressive reductions of SLCP's that can only be achieved through more widespread commercialization of waste to energy and waste to fuel technologies. Fulcrum has appreciated the opportunity to work with both ARB and CalRecycle to find ways to develop effective regulatory outcomes that will advance the goals of SB 1383 and looks forward to continued involvement with these and other agencies in this undertaking.

Thank you for your consideration of our input. We would welcome the opportunity to discuss any specific aspect of our comment further at your convenience.

Sincerely,

A handwritten signature in black ink, appearing to read "Ted Kniesche", is positioned below the word "Sincerely,".

Ted Kniesche  
Vice President, Business Development  
Fulcrum BioEnergy, Inc.

Cc: Janea Scott, Energy Commission  
Tim Olson, Energy Commission  
Richard Corey, Air Resources Board  
Sam Wade, Air Resources Board  
Scott Smithline, CalRecycle  
Evan Johnson, CalRecycle