



April 20, 2012

California Energy Commission
Dockets Office, MS-4
1516 9th Street
Sacramento, CA 95814-5512

Re: Docket No. 11-ALT-01

DOCKET

11-ALT-1

DATE APR 20 2012

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Dear Commissioners:

Thank you for this opportunity to provide input into the 2012-2013 Investment Plan for the Alternative and Renewable Fuel and Vehicle Technology Program. The intent of this letter is to inform the Commission of the importance of advanced biomass feedstocks to the sustainability and operational efficiency of biorefineries in California and to urge of the Commission to make the development of advanced biomass feedstocks a funding priority in the 2012-2013 Investment Plan. This letter represents the thoughts and ideas of a team that includes scientists from two national laboratories and a university and the principals of a California based company where I am the CEO. What follows is a statement of the problem facing the California bioenergy industry relative to single source feedstock based biorefineries, a brief discussion of advanced biomass feedstocks relative to the diverse biomass resources in California and suggestions for the addition of funding priorities that support the development of advanced feedstocks in the 2012-2013 Investment Plan.

The majority of biomass based biorefineries in the United States are sited based on the availability of a single, abundant lignocellulosic biomass feedstock. As such, areas such as the Midwest Corn Belt have an overwhelming advantage for selection as production sites due to the abundant availability of corn and corn stover.

In contrast, California is a state rich in biomass diversity, with 350 different agricultural crops, various woody wastes and municipal wastes (CEC-500-2005-066-D). The availability of these feedstocks varies within the State from region to region and seasonally. As such, there are few single feedstocks that can feed into biorefineries, making California less attractive under the current single feedstock paradigm.

When considering multiple feedstocks, issues of logistics and technological suitability multiply as each feedstock may have differing handling requirements and technological solutions for optimal conversion to biofuel. However, multiple feedstocks may also be advantageous by increasing the overall supply of biomass, decreasing the seasonal nature of single feedstocks, reducing biorefinery shut downs due to lack of biomass and reducing storage with its inevitable losses of biomass (Zhu and Yao, 2011). The State of California needs to demonstrate to prospective biofuel companies how the state's diversity of biomass resources can be advantageous over the single source biomass paradigm that may not be viable in the state. The

solution is the creation of advanced feedstocks derived through the chemical, biological and mechanical preprocessing of diverse biomass resources into a uniform feedstock that is efficiently transportable, storable, and convertible into biofuels or other useful products.

To achieve the quantity and quality of advanced feedstocks needed for California biorefineries, our team recommends the following items for inclusion as funding priorities in the 2012-2013 Investment Plan.

1. An update of the Biomass Resource Assessment completed in 2007.
2. Development of geospatial software tools that identify the proper siting of preprocessing facilities for the upgrading of raw biomass into advanced feedstocks, the siting of biorefineries relative to preprocessing facilities and the logistics of transporting these feedstocks and resulting biofuels.
3. Development of preprocessing and blending technologies and procedures for combinations of biomass resources that have sufficient volumes to generate an advanced feedstock for a sited biorefinery.
4. Optimization of conversion technologies for these newly created advanced feedstocks.
5. A life cycle analysis of advanced feedstock production facilities and the biorefineries they supply.
6. Demonstration of the feasibility of a biorefinery supplied by advanced feedstocks derived from diverse biomass sources in California.

These priorities, executed in an integrated fashion, would further the development and production of renewable low-carbon fuels in the state of California while increasing the sustainability of such fuel by reducing their carbon footprint. In addition, these priorities would more broadly benefit the state of California through the promotion of improved land management and agricultural practices and through the creation of new jobs and economic development.

Please contact me for additional information you may need relative to our team's suggestion for the 2012-2013 Investment Plan.

Sincerely,

A handwritten signature in blue ink that reads "Max Crandall". The signature is written in a cursive, flowing style.

Max Crandall, CEO
Terrestrial Carbon Analytics