



August 17, 2012

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



Re: Docket No. 11-ALT-01

Dear Commissioner Ms. Carla Peterman:

It was a pleasure listening to your many excellent questions to the panelists at the Advanced Ethanol Workshop held August 1. Terrestrial Carbon Analytics, the Lawrence Berkeley National Lab, and the Idaho National Lab offer an innovative solution to better utilize California's renewable resources and to get these varied feedstocks into conversion pathways. Your astute observation and unanswered questions regarding the use of sorghum in lieu of corn as feedstocks for biofuel production has prompted me to write this letter.

Using sorghum as a feedstock makes great economic sense and reduces risk to the farmer. Milo grows well without irrigation and is a good cattle feed. Since the goal of an energy crop is to produce a non-food or non-feed commodity that does not compete with food or feed the energy sorghum plant is emerging as an excellent choice. The sorghum breeders will focus on getting more sugars out of the plant for transportation fuel conversion and will seek to get massive tonnage per acre from the crop. In today's time, for a farmer in the Central Valley to decide whether or not to get into alternative crops like energy crops the annual sorghum energy crop has its advantages. It can be planted annually and that has a tremendous risk advantage over the perennials like switchgrass and miscanthus, other high tonnage energy crops. The farmer plants the annual sorghum in the spring like corn, and harvests it in the fall, and repeats this planting sequence every year. Whereas the miscanthus and switchgrass root system perpetuates and lives for many years. But the greatest advantage, in my opinion, is that the farmer can plant a crop of sorghum and if he/she is unhappy with the economic return can easily plant something else the following year. So, the risk to the grower is not as an extreme commitment as in establishing a perennial energy crop. Another important benefit is if the crude oil supply gets disrupted, the sorghum can be grown in one hundred days or so and we

can produce a lot of transportation fuel in a quick turnaround time for national security purposes.

I noted from workshop presentations and discussions that both the political and public opinions of renewable transportation fuels is changing. Fuels derived from food and feed are getting particular scrutiny this year where drought conditions throughout the country threaten grain production and supplies. The state of California is in a very good position to meet their renewable fuel goals and targets with these types of crops. In addition California is rich in biomass resources sufficient to meet the state's renewable fuels targets with non-food resources. As you heard from Dr. Kaffka's resource analysis, he has classified California into 45 biomass producing regions. Some regions are single mono crops like rice, but others are very complex with more than 20 feedstocks growing in a region. This presents a challenge in the state of California since the current paradigm for conversion of biomass to biofuel is focused in locations where a single abundant resource is present such as in the Midwest corn belt. Utilizing a single biomass resource improves the economics of biofuels production since it allows a single optimized process. The use of multiple feedstocks will have repercussions throughout the entire biomass-to-biofuel production chain. These impacts include harvest and delivery of multiple feedstocks to the biofuel production facility; preprocessing and storage of multiple feedstocks; and development of cost-effective technologies for converting multiple feedstocks into biofuels. However, multiple feedstock utilization will have a huge benefit in the state of California if these issues can be overcome including an increase in the overall supply of biomass, decreased seasonal nature of single feedstocks, reducing biorefinery shut downs due to lack of biomass, and reducing storage times and their inevitable losses of biomass. Sustainable energy crops and waste systems within these regions are very important for our energy independence and security.

We established our company several years ago to support the potential growth of 100 million acres of energy crops in America. We use software technology to implement models of optimizing the biomass feedstock supply system from the farm to the biopower and biofuel conversion plant gate. This has value for those seeking to establish conversion facilities and to be able to source a sustainable feedstock supply. Unfortunately, due to the technical challenges in cellulosic feedstock conversion to transportation fuel, the implementation curve of energy crops being planted has been very slow. We have observed that the very large conversion facilities make almost no sense in California due to the issues mentioned above with this State's huge variety of biomass feedstock. In our collaboration with two Department of Energy National Laboratories, the Idaho National Laboratory (INL) and Lawrence Berkeley National Laboratory (LBNL), we have developed a very different view and approach than what you have seen from your panelists on August 1. We propose to take advantage of feedstock diversity by blending them together to produce a uniform feedstock either at the source of the

feedstock or in regional depots. Utilizing these many diverse feedstocks through blending will allow California to be competitive with locations that have abundant monoculture crops, yet still have the advantages of large scale conversion facilities optimized for single feedstocks. We believe that our approach will bring online more transportation fuel at a much reduced cost. Further, our approach is extremely sustainable because we will know in advance what products can be manufactured from blending these multiple feedstocks based on their field locations, and being able to combine them in regional depots thereby eliminating the need for shipping feedstocks great distances.

We offer the ability to demonstrate these solutions in our collaboration between TCA, INL and LBNL. We disagree with the market's mentality of scaling large single feedstock facilities producing upwards of 100 million gallons per year of transportation fuel, and that is a big part of the cellulosic failure at this juncture. We have the capability to demonstrate processing and blending of multiple feedstocks at the source with equipment from the INL and to demonstrate conversion of the blended feedstocks to biofuels with LBNL's conversion technologies. One of Dr. Kaffka's multi feedstock biomass producing regions would be an ideal test bed for these ideas. We propose to implement and demonstrate our capabilities in these complex regions, and catalog the feedstocks that can bring to market transportation fuel at a significant scale from sustainable California feedstock production lands.

We had a hearing with the CEC on April 13 hosted by Mr. Tim Olsen and we followed up with a docket letter to you dated April 20. During the August 1 workshop your staff mentioned that you are scheduling another workshop focusing on biofuels and other areas more suited to our strengths to be held sometime next month. We are looking very forward to meeting with the CEC again soon.

Warm Regards,



Max Crandall
CEO