Sustainable Conservation

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August 8, 2008

California Energy Commission
Dockets Office, MS-4
Re: Docket No. 08-ALT-1
1516 Ninth Street
Sacramento, CA 95814-5512

Dear CEC and AB 118 Advisory Committee,

Sustainable Conservation, in collaboration with university and government researchers and representatives, farmers and entrepreneurs, is pursuing innovative California biofuel production models which have extremely promising economic and environmental potential. The projects we are coordinating not only meet AB 118's program goal to "...develop and deploy innovative technologies that transform California's fuel and vehicle types to help attain the state's climate change policies." but also go above and beyond this objective by meeting other important environmental aspects, such as improving soil, air and water quality. We are very aware and cautious of unsustainable biofuel crop production models, in both domestic and international settings. However, we are extremely confident in the biofuel production systems which our project team has been evaluating. Although we have been assessing these models, additional funding for continued research and development is critical. Below are brief descriptions of a few of Sustainable Conservation's projects which are well deserving of AB 118 funding.

**Cover crops on depleted soils**

Sustainable Conservation's biofuel crop projects have numerous environmental benefits and assist California in meeting the ambitious green house gas reduction goals documented in Assembly Bill 32. These benefits include improving degraded and retired agricultural land and utilizing salt and selenium laden irrigation water which has otherwise been deemed useless. Our team for this project consists of state and federal researchers, progressive farmers and innovative technology companies who have been evaluating the feasibility of commercially growing cover crops on this unproductive land located in the Westlands Water District. Unfortunately, large tracks of once fertile agricultural land in this region have been taken out of production due to extremely high concentrations of salt and selenium in the soil and surface water. These cover crops, canola and mustard for example, not only thrive on this degraded soil but also extract the selenium and salt, allowing for the exportation of these nutrients from this marginal soil.

Another benefit to this system is the biofuel production and co-product potential. Oil can be extracted from the plant's seeds, which is an ideal feedstock for biodiesel production. After oil extraction, the canola meal can be marketed as a high value; nutrient rich cattle feed, adding another revenue stream to help offset costs of production. Mustard is

another oil seed crop which also has a revenue generating co-product component; an organic pesticide and herbicide, further incentivizing this model.

Another advantage to both of these crops is the far fewer input demands compared to crops typically grown in this area. Both mustard and canola have minimal fertilizer and other input demands. If planted as a winter cover crop, virtually zero irrigation water would be required. These crops can also tolerate the extremely saline and selenium laden water that exists in this part of the San Joaquin Valley, utilizing an otherwise wasted water.

**Sweet Sorghum**

Sustainable Conservation is also partnering with key stakeholders in the evaluation of sweet sorghum as an alternative ethanol production crop. This grain has great biofuel potential for several reasons, which include its high yield, water efficiency, ability to grow in marginal soil, low risk to the environment, rapid growth, energy efficiency and high sugar content. This water efficient crop requires approximately ½ the water as corn and can be grown in heavy clay to light sand soils and returns high yields between 500 to 800 gallons of ethanol per acre per year. It is also resistant to drought and saline-alkaline soils and can tolerate high temperatures and water logging. Sweet sorghum only requires 1/3 of the nitrogen compared to corn, decreasing the likelihood of nitrogen runoff contaminating surface water or leaching into the aquifer. Sweet sorghum matures in only 4 months, compared to 14 months for sugar cane, and provides 2 harvests per planting per year. Only half of the energy is required to produce ethanol from sweet sorghum juice compared to corn. A very energy intensive step is taken out of the ethanol production process because the sugars in the sweet sorghum juice are fermented directly, compared to fermenting corn for ethanol. We are anticipating the sweet sorghum varieties being grown on our plots to produce approximately 20% sugars compared to 12% sugar that Californian sugar cane produces, translating into an even greater net energy balance. Brazilian sugar cane typically produces approximately 16% sugar.

We have been in discussion with Pacific Ethanol, who is very interested in processing as much sweet sorghum juice as we can provide. Unfortunately, we are still researching different types of commercial juice extractors and have found that an in-the-field juice extractor will be the most efficient. This would allow for the transportation of the high sugar content juice directly to the ethanol plant instead of delivering all of the biomass to the plant. The biomass will also generate revenue as a cattle feed. Once an adequate juice extractor is found, we would have to acquire funding to purchase this equipment.

Sweet sorghum is not new to the international biofuel industry. In 2007, China and India produced a total of 1.3 billion gallons of ethanol from sweet sorghum juice. The Florida Department of the Environment granted $1.5 million to a company who will use these funds to design and build Florida's first mechanical harvesting system and an ethanol plant solely for the processing of sweet sorghum juice. Our sweet sorghum project, based near Yuba City, has received partial funding from some of our project partners and encompasses 70 acres of 4 different sweet sorghum seed varieties. The already incurred

expenses have solely been for the crop production costs. Unfortunately, the largest sum of funds is still lacking, which would be for a commercial harvester, juice extractor and all other infrastructural components. This year's first harvest is less than 2 weeks away and we are anticipating very impressive yields and crop sugar levels.

One of the objectives of this written comment is to ensure that the CEC and the AB 118 Advisory Committee does not categorize all biofuel crop proposals into the Midwestern corn to ethanol and soy to biodiesel categories. We are very confident in the production models that our team has and is currently evaluating however funding is required to assess the greater environmental and economic feasibility of these systems. The above projects are perfect examples of what AB 118 monies are intended for, to fund additional research to evaluate these opportunities and determine whether California should further pursue these models.

Sincerely,

Joseph Choperena
Sustainable Conservation