From: ARB Clerk of the Board
To: Bechtold, Bradley@ARB; Hopkins, Chris@ARB
Subject: FW: Comment re: ab179carbctchcd2020
Date: Wednesday, November 4, 2020 9:05:10 AM

From: Brian Wilcox <brian.wilcox@marinebiomass.com>
Sent: Wednesday, November 4, 2020 9:00 AM
To: ARB Clerk of the Board <cotb@arb.ca.gov>
Cc: Brian Wilcox <brian.wilcox@marinebiomass.com>
Subject: Comment re: ab179carbctchcd2020

The web site consistently gave the message "URL rejected" when I tried to submit through the normal process.
Comment on CAPTI (Executive Order N79-20)
Name: Brian Wilcox, Co-Founder and Chief Engineer, Marine BioEnergy, Inc., La Canada, CA 91011
Marine BioEnergy has a contract with the U.S. Department of Energy to develop a system to grow Giant Kelp, native to California, in the open ocean. This kelp would be processed by available commercial plants into carbon-neutral fuels – carbon-neutral in the sense that the CO_2 released in burning the fuel is re-absorbed by the kelp in equal amounts to create each next crop. One attractive biofuel is biocrude, as input to the existing petrochemical infrastructure to deliver gasoline, diesel, jet fuel, etc. Also, kelp is easily processed into biogas to supply the existing natural gas network, and in particular can stabilize the electrical grid by allowing existing gas-fired power plants to respond to fluctuations that inevitably will result from increased use of solar panels and wind farms.
The premise of Marine BioEnergy is that kelp will grow in the open ocean when depth-cycled from the surface to absorb sunlight to below the thermocline each night to absorb the abundant nutrients that exist there but not at the surface. Our first test of this concept was conducted in the summer of 2019 off the coast of Catalina Island. That test, performed in collaboration with the marine research facility on Catalina operated by the University of Southern California, showed that kelp grew 5% per day when depth-cycled, while the control kelp grew only 3.5% per day in a nearby natural kelp bed. USC biologists are also part of another DOE award to catalog the genome of giant kelp off California and to create sterile hybrids that can grow much faster than native kelp. Current cost estimates are that the near-term cost to produce kelp will be well below $100/Dry Metric Ton (DMT), with eventual costs expected to be as low as $25/DMT. This low cost will allow the existing petrochemical and natural gas infrastructure to switch to carbon-neutral bio-fuels seamlessly and without increase in cost.
To replace ten percent of the U.S. liquid transportation fuels, we would need to cultivate an area about equal to the State of Utah. However, the Pacific Ocean has an area of 705 "Utahs". It is straightforward to see how to expand kelp farming to ultimately replace all fossil fuels used globally. It is similarly straightforward to accomplish this within 10-15 years, as climate scientists have stated is essential. A study of the net energy used to grow kelp shows that kelp farms will deliver over 90 times as much energy as is used to create the farms. The founders of Marine BioEnergy have existing patents on the depth-cycling concept in all large energy-importing nations of the world. California is ideally positioned geographically, biologically,

and technologically to foster this new industry until it becomes a dominant export of the state. Banning the use of fuels based on the apparent premise that any fuel is a fossil fuel will halt this revolutionary solution to climate change.