



Robotic kelp | Photo source Pixabay

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## ROBOTIC KELP FARMS OFFER HOPE FOR CHEAPER BIOFUELS



### **American startup plans to use drone submarines to grow kelp for biofuel in moving ocean farms.**

Many see renewable, carbon neutral energy production as the best hope to mitigate the effects of global warming. Solar, wind and hydropower have all seen significant innovation and expansion in recent years. However, scaling up the harvest of these forms of energy usually requires a large amount of land. Now, startup **Marine BioEnergy** is hoping to develop an alternative that does not take up any space on land – carbon-neutral biofuels developed from giant kelp. Kelp is one of the fastest-growing producers of biomass, and it needs no watering, weeding, pesticides, or fertilizers. It grows up to 30 centimeters a day, and its low cellulose content allows it to be easily processed into liquid biofuel. The kelp also absorbs carbon dioxide in the ocean, which could help address ocean acidification.

To maximize growth, Marine BioEnergy plan to tether their kelp farms to drone submarines. These will submerge the entire farm every night, bringing the kelp down to the cooler, nutrient-rich waters 100 to 300 meters beneath the surface. The drones will then bring the farm back up again as the sun rises, so the kelp can receive enough sunlight for rapid growth. The drones themselves would be powered by solar and wave generators, and the farms would float with the circular gyres found throughout the Pacific Ocean. Once the kelp is ready for harvest, the drones would pull the farm to a refinery ship, which would convert most of the kelp into fuel before sending the farm back out into the ocean to regrow. The eventual goal is to develop floating farms scattered throughout the Pacific.

The U.S. Navy first looked into the idea of raising kelp as a potential source of biofuel during the gas shortages of the 1970s. Although reports labelled that attempt a failure, Marine BioEnergy hopes to achieve a better outcome with the use of modern technology. A test project, funded with a grant from the [Department of Energy's Advanced Research Projects Agency](#), will be carried out over the next two and a half years by researchers at the [USC Wrigley Institute for Environmental Studies](#). If all goes well, the farms will be heading out to the open ocean for additional testing shortly thereafter. What other advantages might there be to growing fuel in the ocean?

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