

Applicant name: KONA Carbon, Inc.

Project Director/Principal Investigator: Christoph Mack

Project Title: Valorization of Sargassum via Hydrothermal Carbonization

Project Objectives: This project's mission is to capture and retain the carbon stored in algal and other biomass material and generate valuable byproducts for community stakeholders. Kona Carbon, HydroGeoLogic, Inc. (HGL) and Algae Research Supply (ARS) have collaborated to advance a novel, proprietary implementation of hydrothermal carbonization (HTC) technology that converts Sargassum and other biomass waste to valuable, durable products that can generate value for community stakeholders while preventing carbon from returning to the atmosphere.

Project Description: The project will develop a new Hydrothermal Carbon Valorization (HCV) process designed to safely convert waste biomass such as Sargassum, manure, and discarded food into Hydrochar, a material rich in stable carbon and nutrients. Hydrochar, useful as a soil amendment on its own, significantly increases in value when converted into Activated Carbon and fertilizer. The Hydrothermal Carbon Valorization system represents a significant advancement over existing implementations of HTC. Newly developed pre-processing subsystems will prepare the biomass (also known as feedstocks) as collected and not require the expense and energy of freshwater rinsing and drying. These subsystems will also remove heavy metals and prepare the biomass for conversion to high-value Activated Carbon (AC). The KONA HCV system will be autothermic, harvesting the excess energy produced by the hydrothermal reactions and using it for system power. A demonstration-scale version of the KONA HCV will be implemented in Puerto Rico, near local sources of Sargassum. It will be self-contained, designed to be replicated for broad distribution throughout the region and beyond.

Potential Project Impact: A verifiable implementation of the KONA HCV will establish the foundation for expansion into a distributed network of reactors, with envisioned capability to remove 9,000,000 tonnes of Sargassum, sequester over 2,000,000 tonnes of CO₂e, and generate over US \$1B in product and Carbon Credit revenues every year. Furthermore, the liquid fertilizer generated will be sufficient to fertilize 350,000+ acres of cropland per year, displacing more expensive, high-emissions incumbent products. This will help support growth of a circular, green economy throughout the region, transforming the perennial toxic nuisance of the Great Sargassum Belt into sustainable, climate positive jobs and economic stimulus.

Major Participants: HydroGeologic, Inc., Algae Research Supply, Inc., Environmental Mapping Consultants.