

'Green' energy, plant food from Florida's stinky seaweed? Ideas will be put to test

January 8 2024, by Ashley Miznazi, Miami Herald



Credit: Pixabay/CC0 Public Domain

Seaweed poses all sorts of problems when it piles up on South Florida beaches. It stinks, spoils the view and makes swimming icky. It's also pricey to haul off to the landfill, which currently is the only viable

disposal option.

Someday maybe a ton of sargassum might be worth its weight in, if not gold, maybe fertilizer.

Turning seaweed into plant food is one of six proposals that Miami-Dade is considering as part of a county effort to find new ways to deal with a seaweed surge that scientists expect climate change will only make worse. Other potential pilot projects could explore converting sargassum into building material, types of "green" fuel and even an additive that could help reduce erosion of the beaches where the sargassum winds up.

These ideas spring from an invitation for fresh approaches offered last year by the Miami-Dade Innovation Authority, a nonprofit that connects local government to private technology companies. The agency has now selected six finalists to come up with environmentally friendly ways to get rid of all the seaweed that annually piles up on South Florida's shores. At least three winners, expected to be selected later this month, will each get \$100,000 to take on a challenge complicated by the fact that sargassum often contains unhealthy levels of [heavy metals](#) and arsenic.

"The [project's] primary purpose is ecological," Mayor Daniella Levine Cava told the Miami Herald when the project launched in July. "Not filling up the landfills with a product that ideally doesn't need to go in the landfill. It's not garbage. It's not waste. It's organic, and we hope there will be other uses for it."

Here's a look at the proposals:

Creating 'green hydrogen'

Chemergy was incorporated in Miami in 2011 by a family with a dream

of producing low-cost renewable "green hydrogen" fuel from organic and plastic waste. Maybe sargassum could be part of that waste stream, too.

"We thought the seaweed would be a logical thing to throw into our system," said Melahn Parker, the president of Chemergy, which he co-founded with his father, Robin. "Our facility is near the source of the seaweed and it's a way to completely eliminate it."

The system uses a [chemical process](#) that takes [organic material](#) and burns and separates it into hydrogen, carbon dioxide and ash.

The hope is that when putting sargassum through the system, all the "bad stuff" like the silicone, lead, sand and magnesium mixed within the sargassum should turn to ash, Robin Parker said.

Beyond that, The CO₂ is sequestered and the hydrogen can be stored to one day be put into the grid or be used for transportation. It's a greener fuel option too: if you can run a car on hydrogen, water would come out of the exhaust pipe.

In the past, the company has worked with the the Department of Energy.

"I think this can be the cheapest solution," Melahn Parker said. "It's just burdened by high equipment costs now."

Helping plants grow

EcoChar, a company based in The Netherlands, applied to burn the sargassum into an agricultural product called biochar. Biochar contains mineral ash, phosphorus, potassium, magnesium and fixed carbon that can be used as a soil additive that increases water retention.

Seaweed would be a new material for the company to work with. Usually, they deal with animal manure. They have projects in Georgia and Pennsylvania and are processing turkey manure at a farm in Saudi Arabia too.

Shane McGolden, the U.S. based EcoChar spokesperson, said when organic material is burned into char, the heavy metals are locked and stored.

The equipment, however, is not portable and goes for millions. McGolden wasn't able to identify who at the company applied or how the company would be able to help the county with the \$100,000 grant budget.

Protecting the coast

ShoreLock, located in downtown Miami, makes a product designed to reduce coastal erosion by strengthening the chemical bond between water and sand. According to the company, adding this product to sand should slow down how much the tide pulls the sand back into the ocean and mitigate erosion.

Blayne Ross, the CEO of ShoreLock, said the current mixture starts with breaking down plant-based material and that sargassum could be potentially be added. He believes the company's process would strip out heavy metals or toxins.

"What was really cool about the challenge for us was being able to take the sargassum to protect the coastline," Ross said.

If they receive the money, their next step is to partner with universities to see how Shorelock would perform in a wave tank.

Fertilizer for farmers

Algas Organics is a startup that turns the island of St. Lucia's sargassum into fertilizer that U.S. farmers buy. The founder, Johanan Dujon, noticed the sargassum pileups at his home on St. Lucia beaches and the eastern Caribbean in 2014 hurting the tourism economy. He now wants to explore collecting sargassum off of Miami's beaches, where he spends part of his time.

Algas Organic's patented hybrid fermentation process removes heavy metals and processes over 1,000,000 pounds of seaweed per year, the Algas Organics website said.

Building material

Adar Technologies thinks that it can dry and sanitize seaweed with a machine that breaks down material at the speed of sound. The end product is a fine, dry and odorless powder with 90% of its original moisture content removed.

The team is based in Wyoming and Arizona, but their equipment is all housed in a shipping container that can be transported. The machine is relatively simple, 13 feet long and 9 feet tall, with material going in one side and coming out the other. So far, they've tested it on 70 different materials and are eager to try the sargassum.

The powder could be used in building materials, or potentially a feed stock or fertilizer product. Right now, those options are off the table because of heavy metals and arsenic levels in seaweed. One part of their proposal to the county was to test whether [building material](#) with sargassum might leach out any dangerous compounds.

"Some people have some great technology to treat the heavy metal already, and some are in the competition with us, so we'll see where they end up but we do not," said Doug Farrington, the [chief operating officer](#) at Adar Technologies.

Biogas

YA Maof Holdings and Management has projects around the world with a focus on waste and water treatment. Some of their past projects include an organic waste to energy facility in Punta Cana, Dominican Republic and a recycling cite in Israel.

Sargassum isn't a new endeavor for the company. In 2018 they worked with the government in the Mexican state of Quintana Roo, which reported that in 2018, 522,226 tons of sargassum were collected from the coasts. By using algae waste, YA Maof Holdings and Management said they could create a biogas.

What's next

Once the finalists are chosen, The Nature Conservancy, a global conservation organization, will advise and evaluate the candidates while they test their products during the Spring 2024 sargassum season alongside Miami-Dade County and its partnering organizations.

Though summer 2023 turned out to be far less than the massive sargassum explosion some scientists had expected, the threat of more waves of seaweed in the future remains. Scientists believe warming ocean waters are giving the sargassum a hospitable place to prosper.

"Increasing [sargassum](#) blooms are attributable to many factors, including changes in ocean currents, extreme weather, and warming waters

associated with [climate change](#)," said Morgan Higman, the Florida climate strategy director at The Nature Conservancy.

2024 Miami Herald. Distributed by Tribune Content Agency, LLC.

Citation: 'Green' energy, plant food from Florida's stinky seaweed? Ideas will be put to test (2024, January 8) retrieved 16 August 2024 from <https://phys.org/news/2024-01-green-energy-food-florida-stinky.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.