Hawaii Small Business Wins Innovation Award to Reduce the Cost of Sustainable Aviation Fuel

Simonpietri Enterprises LLC (www.simonpietri.com and www.alohacarbon.com)
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In honor of Earth Day, Simonpietri Enterprises announced that its Aloha Carbon technology has won a competitive award from the U.S. Department of Agriculture (USDA) for its innovations to make renewable jet fuel in a way that is cost-competitive with petroleum. The Aloha Carbon concept diverts construction and demolition debris from landfills and converts it via gasification to fuel. This $650,000 award adds to the competitive innovation awards that the Kailua, HI-based small business has won within the past year from the U.S. Environmental Protection Agency (EPA) and U.S. Department of Energy (DOE) to further develop the technology. "Treated, painted, and glued lumber and other organic waste from construction and demolition debris can't be burned in a biomass power plant, so today most of it goes straight into landfills all across the U.S. Hawaii is no exception." said Joelle Simonpietri, president of Simonpietri Enterprises LLC. "This idea, to make fuel out of construction and demolition debris rather than stick it in the ground, was born here in Hawaii to solve Hawaii problems: too many landfills that need to be expanded or relocated in these islands we call home, not enough local supply of renewable fuel to replace imported fossil fuels, and no local supply of renewable fuel that can be used in airplanes." This award from the USDA will fund an integrated system trial of Simonpietri's concept to make a Sustainable Aviation Fuel (SAF) component from real-world construction and demolition debris waste. The result after successful scale-up could be a win-win-win: make transportation fuel with a low-greenhouse gas footprint at a cost competitive with petroleum, and divert and reuse waste being landfilled on O'ahu.

Tackling Hawaii's largest source of greenhouse gas emissions: long-haul aviation
Sustainable aviation fuel is considered key to reducing the global aviation industry's carbon footprint. Last year, more than one-third of Hawaii's total petroleum energy use was from commercial and military aviation fuel, according to the Hawaii State Energy Office in its latest "Facts & Figures" report. "This concept, to gasify construction and demolition debris waste wood and convert it into SAF, presents a highly promising pathway for sustainable and cost-effective alternative aviation fuels" agreed Timothy Pohle, Vice President for Environmental Affairs at Airlines for America, the trade association for the leading U.S. passenger and cargo airlines. "That Simonpietri Enterprises intends to convert construction and demolition debris is a particularly important element for us, as this enables diversity and local sourcing of feedstocks from urban areas around major airports. Simonpietri's project in Hawaii will enhance regional diversity of U.S. sustainable aviation fuel supply, and provide additional waste re-use benefits to the markets our members serve."

Near-zero lifecycle greenhouse gas emissions, equivalent to planting 100,000 acres of forest
Simonpietri's Aloha Carbon waste-to-fuel process was also analyzed by international environmental certification firm SCS Global. SCS Global projected the process would reduce lifecycle greenhouse gas emissions by over 97%, by displacing imported petroleum with a local

waste wood-derived substitute. The potential Aloha Carbon project on Oahu to divert organic C&D waste from the landfill and convert it to a fuel substitute was estimated by SCS Global to displace over 100,000 metric tons of carbon dioxide equivalent per year. "This emission reduction from one C&D wood-to-fuel conversion project in Hawaii is equivalent to the carbon stored by 70,000 – 165,000 acres of U.S. forests per year" stated SCS Global analyst Brent Riffel. To put that into context, there were 160,900 acres of prime agricultural land in Hawaii in 2009 according to the Farmland Information Center. That means that this one Aloha Carbon waste-to-fuel project would be the equivalent of planting enough trees for a forest, on nearly all of the agricultural land in the Hawaiian islands, without taking any of that land away from agriculture!

Time and space are running out for construction and demolition debris disposal in landfills
An average of over 2000 tons of construction and demolition debris are landfilled every day on Oahu according to the state's sole C&D landfill operator, PVT Land LLC. About 40% of that is wood, cardboard, paper, and other plant-based material which could be diverted to make low-greenhouse gas fuel. Due to limited capacity at the PVT Land landfill which may only have three (3) years of life remaining, without an alteranative like Aloha Carbon in place, more and more waste will have to be sent to the Waimanalo Gulch Sanitary Landfill, the County of Honolulu's only municipal solid waste landfill. Waimanalo Gulch itself is mandated by the State of Hawaii Land Use Commission to close in 2028. "It is important to provide options for wastes unsuitable for recycling or combustion, such as C&D waste and automobile shredder residue. Work like Simonpietri's to develop technology and plants that can divert waste from landfills and convert it into hydrogen and fuels, are paramount" agreed City and County of Honolulu Energy Recovery Administrator Ahmad Sadri.

Looking for community input to inform the innovative project's Environmental Assessment
To take the next step from innovative concept to a physical plant to be that would do this waste diversion and conversion in Hawaii, Simonpietri is actively looking for input from local residents to inform the Aloha Carbon design and draft Environmental Assessment (EA). "We are trying to do something different from the usual project development process" Simonpietri said in a presentation on Aloha Carbon to the Makakilo-Kapolei Neightborhood Board in January, "which is get community input to help us shape the project *before* we write our Environmental Assessment." Normally developers can only afford to do so for the minimum mandatory public comment period, after the engineering and permitting has all been completed, "when it's really too late for community members to have any say." Simonpietri Enterprises is looking for this community input for its first Aloha Carbon plant, to be constructed in the Campbell Industrial Park/Kalaeloa area of Kapolei, Hawaii. Click here to take the survey (https://www.surveymonkey.com/r/HICommunityInputBioenergy)

Using innovation to reduce cost and remain competitive with petroleum prices
Simonpietri's team completed a series of proof-of-concept trials on its waste-to-fuel conversion process with the Gas Technology Institute of Des Plaines Illinois in 2021. These trials were the first-ever Small Business Innovation Research (SBIR) funding award from the U.S. Department of Agriculture for sustainable aviation fuel technology. The USDA award from the National Institute of Food and Agriculture allowed Simonpietri Enterprises to also grow its team through

and complete engineering work and show that the process is technically and economically feasible. “Even more than that, it helped to confirm our estimates that we can make a fuel that can get into competitive range with petroleum on price – and at prices *before* Russia invaded Ukraine -- but at a much lower greenhouse gas lifecycle cost” stated Aaron Ellis, the Director of Finance at Simonpietri Enterprises.

Helping Hawaii lead the world in aviation innovation and sustainability

"Because of our remote location, population density, and susceptibility to climate change impacts, Hawai'i needs to lead the world in innovation in aviation sustainability, and this project is our small contribution," said Joelle Simonpietri. Simonpietri Enterprises is very appreciative of the support provided by the US Department of Agriculture, the US Environmental Protection Agency, the U.S. Department of Energy, the Airlines for America trade association, and the City and County of Honolulu, and other partners to help make this idea a reality.

Just three loads of the thousands of tons of construction and demolition debris landfilled on Oahu in Hawaii daily. (Simonpietri Enterprises photo taken at PVT Land, May 2020)

Simonpietri Enterprises team working onsite at West Oahu Aggregate's Nanakuli waste consolidation operation, August 2021. Pictured from left are Simonpietri Enterprises employees Zachary Wadas, Joelle Simonpietri, and Jennifer Chinen. Simonpietri Enterprises photo.

Photo of one day of the wood waste separated from construction and demolition debris at PVT Land's (now closed) sorting plant in May 2020, Nanakuli HI. Simonpietri Enterprises photo.

About Simonpietri Enterprises LLC: SEL is a Hawaii-based woman- and veteran-owned small business, focused on technical innovation and first-of-kind project development of emerging clean and renewable technologies. SEL helps execute projects to improve the environmental and economic sustainability of heavy industrial activities through renewable energy conversion, waste reduction and re-use, and greenhouse gas lifecycle impact reduction. Simonpietri Enterprises serves as an industry advisory committee member of the U.S. Federal Aviation Administration's Aviation Sustainability Center of Excellence (www.ascent.aero), and the U.S. public-private Commercial Aviation Alternative Fuel Initiative (www.caafi.org).

SEL founder and owner Joelle Simonpietri, a former active-duty U.S. Navy officer, previously co-led the U.S. Indo-Pacific Command's Green Initiative for Fuels Transition Pacific (GIFTPAC) program with the U.S. Navy's Director of Operational Energy. GIFTPAC helped to facilitate supply chain development for domestic renewable aviation fuel supplies certified for use by all U.S. military platforms across the Asia-Pacific. Captain Simonpietri also currently chairs the board of the non-profit Hawaii Bioeconomy Trade Organization (www.hawaiibioeconomy.org).
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