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UGA licenses technology to make fuel from dead forests and agricultural waste

Athens, Ga. – An innovative process for turning waste biomass—such as dead trees, agricultural waste and lumber byproducts—into a liquid fuel to power conventional engines has been licensed by the University of Georgia Research Foundation, Inc. to Tolero Energy, LLC, a private biofuels company based in Sacramento, Calif. The technology represents a leap forward for the biofuels industry: the ultra-low-sulfur biofuel does not require additional refinement or processing before blending with biodiesel and petroleum diesel.

The exclusive license provides Tolero Energy global rights to the technology, including the right to grant sublicenses.

Tolero CEO Chris Churchill said the company will focus on the transportation fuels market as it completes development of the UGARF bio-oil technology. He expects to make product based on the technology available in the first half of 2010.

Lead inventor of the technology is Tom Adams, a retired member of the University of Georgia Faculty of Engineering. Co-inventors are John Goodrum, Manuel Garcia-Perez, Dan Geller and Joshua Pendergrass—all presently or previously associated with the UGA Faculty of Engineering.

“Fuel produced through this efficient technology, which uses dead biomass as the starting material, holds the promise of being highly economical, carbon-negative and environmentally acceptable,” said Adams, now an engineering consultant.

Tolero will use this low-cost, on-site process to turn non-food, waste biomass into sustainable and renewable forms of energy and industrial products. The biomass is heated at carefully controlled high temperatures in the absence of oxygen, a process known as fast pyrolysis. The vapors produced during pyrolysis rapidly condense into a bio-oil that can be added to biodiesel or petroleum diesel. Other pyrolysis by-products are gas and bio-char, which can be used as a soil amendment.

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Dead trees are one of the major sources of waste biomass for Tolero, said Churchill. He explained, “Infestations of the mountain pine beetle have devastated forests in the western United States and Canada, killing over 40 million acres of pine trees. As the trees decompose and decay, they release millions of tons of CO₂ into the atmosphere, and the devastation has created a significant and dangerous fire hazard in the western forests.

“Harvesting dead trees and forest residue and converting them to renewable fuel and soil amendment products will help reduce the CO₂ released into the atmosphere and reduce the fire danger. The recent fire in the Los Angeles foothills, which was fueled by years of highly flammable dead biomass build-up, is a prime example of a situation where this technology can be put to use. Tolero has the capability to establish pyrolysis facilities to process the dead underbrush and convert it to a renewable fuel that is easy to transport,” Churchill said.

Tolero also will convert other types of cellulosic biomass, such as agricultural waste and waste wood pallets, into renewable transportation fuels, heating fuels, soil amendments and industrial products.

“We are glad that our new business partner, Tolero, will be using biomass waste as starting material for the production of biodiesel,” said Gennaro Gama, senior technology manager at UGARF charged with the management of UGA’s bioenergy technologies. “Not only is this approach socially responsible, since it does not employ food crops as the source of biofuels, it also is ecologically sound, as it will open areas to reforestation and at the same time lead to the production of cost-efficient, sulfur-free fuels,” he said.

“This commercialization approach perfectly reflects the social and ecological concerns of UGA’s bioenergy researchers and the research partnership formed with Tolero,” Gama concluded.

UGARF performs the technology transfer function for the University of Georgia, taking assignment of patents and licensing such patents to the private sector in return for royalty income to support the research mission of the university. To learn more about technology commercialization at the University of Georgia, see <http://www.ovpr.uga.edu/tco/industry/>.

Tolero Energy LLC focuses on renewable transportation fuel from waste biomass. More information is available at www.toleroenergy.com.