

Researchers examine feasibility of local 'green crude' production

By M. Therese Shakra

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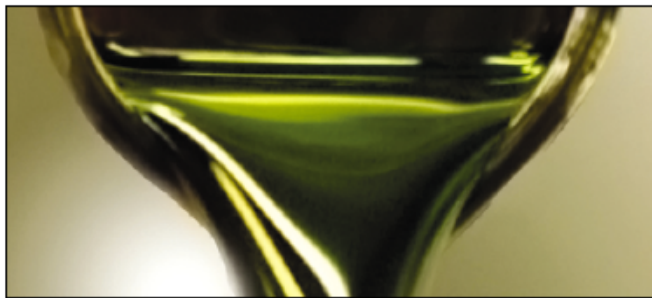
LAS CRUCES — The Institute for Energy and the Environment, part of New Mexico State University's College of Engineering, is in the process of finalizing a proposed grant

for approximately \$450,000 to investigate the commercial feasibility of a geothermal,

algae-based (algal) transportation fuel production facility.

Luz-Elena Y. Mimbela, IEE project manager, submitted the proposal for funding to a private partner whose support will provide funding for a demonstration facility at the NMSU Geothermal Greenhouse Facility.

"This will augment the anticipated Energy Innovation Fund grant by the state of New Mexico under Gov.



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Green crude (also called biopetroleum) refers to green-colored crude, which yields clean-burning fuel from algae, sunlight, carbon dioxide and water. New Mexico State University will ask for money to investigate the commercial feasibility of a green crude production facility.

Richardson's highly successful mandate to be a Clean Energy State," Mimbela said. As the principal IEE investigator, she is leading the effort in merging the grant and the private funding. The overall objective of the project is to renovate NMSU's GGF to develop a test facility. The facility would investigate the technical and economic feasibility of a commercial-scale geothermal algal transportation fuel operation for

replication in southern New Mexico or similar region with geothermal resources.

Given the triad of decreasing availability/reliability (foreign dependence) of fossil fuel, its rising cost, and its detrimental environmental impact, carbon-neutral, renewable fuel sources are critical. The carbon dioxide emissions from burning biofuel in transport vehicles and in the refinery process are radically reduced. However, not all biofuels are cre-

ated equally. Like plants, algae require primarily three things to grow: sunlight, carbon dioxide and water. The most complex marine form of algae are seaweeds, with 10,000 species, and one of the most advantageous sources for new fuel production.

Advantages of algal-based fuel sources include the following: Algae can be grown on non-agricultural land without competition for food or fertile soil, versus corn, or the largest domestic biofuel source, soybeans, diverting agricultural cropland. Algae can use sea or brackish water (abundant in New Mexico) or even consume pollutants from sewage and power plants, thus not using another critical resource: fresh water. In addition, algal fuel sources are generally biodegradable organic matter, less likely to cause environmental damage if broken apart or spilled during transport. When done right, algae-generated fuel

offers something different: The algal crude can be refined just like petroleum hydrocarbons to produce high-octane jet fuel and gasoline.

"We have abundant sunlight, land, brackish water and the expertise to develop a commercially viable 'green crude' facility," said Abbas Ghassemi, IEE executive director.

Green crude (also called biopetroleum) refers to green-colored crude that yields clean versions of gasoline and diesel from algae, sunlight, carbon dioxide and water. The result is chemically equivalent to the light, sweet crude oil traditionally used for distillation of carbon-based fuels. Green crude blends seamlessly into existing energy distribution and infrastructure systems.

IEE's project has additional innovative advantages over other entities conducting similar research. Southern New Mexico is a premier location for large-

scale production of targeted algal strains as a fuel source, and their use of geothermal energy for heating and make-up water. The geothermal water resource will be evaluated as a heating source for both the indoor and outdoor cultivation units to allow for year-round operation of the facility. Other targeted experiments will be carried out to optimize the design and operation of this type of facility in southern New Mexico.

IEE comprises WERC: A Consortium for Environmental Education and Technology Development, CEMRC, and the Southwest Technology Development Institute. For information, contact Ghassemi at (575) 646-2038 or visit <http://iee.nmsu.edu>.

"Eye on Research" is provided by New Mexico State University. This week's feature was written by M. Therese Shakra of the Institute for Energy and the Environment at New Mexico State University.