

FIU developing earth-friendly mobile hospital

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Contact: OSCAR CORRAL

Imagine a team of doctors, soldiers or humanitarians airlifted into a remote jungle, many miles from the nearest road or power grid. Within 24 hours, it can be up and running from the jungle floor.

Researchers from Florida International University are working with U.S. military planners to develop a makeshift mobile hospital that runs completely on solar power, uses only a few gallons of water per day, and can treat dozens of people who consider electricity a luxury. The project began a test run two weeks ago in the Honduran rain forest.

If successful, the self-sustaining tent-like structure could become a model for the U.S. military and American emergency response teams to set up in remote areas.

FIU, already nationally recognized for its creative use of solar power technology, announced last month that it had received a \$2.4 million grant to pursue the project.

The idea of "mobile medical readiness" was born at FIU's Applied Research Center as part of the school's role in the Western Hemisphere Informatics Institute. It is a joint effort between the U.S. military, and the militaries of other Latin American countries "to develop a sustainable program that addresses key security issues," according to an FIU brochure.

FIU and the military want to send mobile medical centers to remote villages in Central America to test their ruggedness and effectiveness. If the tests go smoothly, the military may adopt the system for use worldwide in remote locations where local health care is limited. Portable hospitals can also be powered using wind and micro-hydro turbines from running water, or even biofuels harvested from surrounding vegetation.

"The research really is about looking at those things that are available, and doing a military assessment in the field to see how they stand up under pressure," said Bob Reedy, director of the Applied Research Center. "What the local communities get out of this is access to advanced medical treatment."

From a distance, the hospital resembles the tents used by the Korean War-era doctors on the 1970s television show M*A*S*H, which stands for Mobile Army Surgical Hospital. Set up outdoors, it covers an area about the size of a volleyball court but can grow larger.

But unlike the hospitals in the popular TV series, which ran on liquid fossil fuels, the plastic roof in FIU's circa-2008 MASH unit is covered with thin-film solar panels. The thickness of two credit cards and can be rolled up and curved over almost any surface to produce electricity from sunlight, Miller said. The energy from the panels runs during the day and is stored in batteries for use at night.

"This is the most cost competitive way to go for this application," said Bob Reedy, director of the Solar Energy Division for the Florida Solar Energy Center. They are also very light, and they are very rugged, unlike glass, or rigid modules. They can take some damage and actually can even take fire.

Each thin-film strip produces 1.5 kilowatts of electricity, or about the amount required to power a radio, a computer and some lights. The canopy, which is about 10 feet by 10 feet, and Northwest 107th Avenue, recently had three strips, producing 4.5 kilowatts. To compare, a four-kilowatt system is enough to power the average home. Energy-intensive air conditioning, require 6-kilowatt systems, said George Douglas, a spokesman for the National Renewable Energy Laboratory.

The military typically burns diesel fuel to power generators for electricity, Miller said, although some renewable energy technology is being used in Iraq. The system is silent, has no emissions, and can be rolled up and shipped anywhere.

The price of the thin-film panels is still high because the technology is so new, but their potential is vast. The cost of manufacturing them can be lowered as the technology improves, and the natural resources, such as silicon. But so far, most thin films are not as efficient as regular solar panels.

Not everyone is a fan of thin film technology.

"Some people call them unbreakable, we call them already broken," said John Kimble, owner of Sun Electronics in Miami, which does not carry thin film solar panels. "They are not as durable as regular solar panels."

FIU engineers have developed water-filtration and desalinization systems powered from solar and wind energy. Rural villages would be able to power their homes and businesses with clean, renewable energy.

"These technologies can not only bring basic power, but can foster business diversification, growth and added opportunities which in turn leads to less dependence on the USAID Farmer-to-Farmer Program at Florida International University. "Above all else, they are environmentally sound."

Solar panels are already being put to every-day use in Miami. The most high-profile project so far is the solar panel installation project at Miami City Hall. The project, which says the panels -- which are rigid and permanently installed -- and other energy efficiency steps, will cut the electric bill at City Hall by \$9,000 a year.

Last month, Congresswoman Ileana Ros-Lehtinen visited FIU's engineering department for a ceremony to present a \$2.4 million check in public monies for the mobile medical unit project.

"We build a better future for these communities," Ros-Lehtinen said. "It's for the benefit of the U.S. to do these programs."