

FIU, military team up to build solar-powered clinic

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MIAMI -- 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, they can be up and running on 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 and can treat dozens of people who consider electricity a luxury.

The project began a test run recently in the Honduran jungle.

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

FIU, already nationally recognized for its creative use of solar power technology, is receiving a \$2.4 million grant to pursue the project with the Army. The grant is being provided by FIU's Applied Research Center as part of the school's role in the Western Hemisphere Information Exchange Program.

That program, known as WHIX, is a joint effort between the U.S. military and the militaries of other Latin American countries 'to develop a sustainable environment and renewable energy,' 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 liquid fuel supplies are difficult to transport.

The transportable hospitals can also be powered using wind and micro-hydro turbines from running water, or even biofuels harvested from surrounding crops. 'What the local communities get out of this is access to advanced medical treatment.' From a distance, the hospital resembles the tents used in the television show MASH, which stands for Mobile Army Surgical Hospitals.

A simple rectangular tent set up outdoors, it covers an area about the size of a volleyball court but can grow.

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 cells.

The cells are 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 cells feeds a battery system that keeps the power running day and night. 'This is the most cost competitive way to go for this application,' said Jerry F. Miller, associate director of the Florida Solar Energy Center. 'Thin films can be flexible, so they can be put on a canopy. They are also very light, and they are very rugged. They can take some damage and actually can even take a bullet hole. They can take a licking and keep on ticking.' Each thin-film strip produces 1.5 kilowatts of electricity, enough to power a computer and some lights.

The canopy, set up at FIU's Engineering campus at Flagler Street and Northwest 107th Avenue, recently had three strips, producing 4.5 kilowatts.

To compare, a four-kilowatt system is enough to power the average American home; South Florida homes, because of energy-intensive air conditioning, use more power. Miller is 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 and Afghanistan.

The solar panels produce no sound or other 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 lower than regular panels, because they use only a fraction of the natural resources, such as silicon. But so far, the technology is still in the experimental stage.

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 Eletronics. 'Anything that's flexible will disintegrate under the sun.' FIU engineers have developed water-filtration and desalinization systems powered from solar panels.

Rural villages would be able to power computers and communications devices with them. 'These technologies can not only bring basic power, but create economic opportunities - which in turn leads to less urban migration,' said Carmen Algeciras, director of the USAID Farmer-to-Farmer Program at FIU. 'Above all, they are already being put to everyday use in Miami.'

The most high-profile project so far is the solar panel installation project at Miami City Hall, championed by Miami Mayor Manny Diaz. Diaz says the project and other energy efficiency steps will cut the electric bill at City Hall by \$9,000 a year.

Last month, U.S. Rep. Ileana Ros-Lehtinen, a Miami Republican, visited FIU's engineering department for a ceremony to present a \$2.4 million check 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 projects.'