

US EPA ARCHIVE DOCUMENT

POWERING UP LESOTHO GROWING AMERICA'S GREEN ECONOMY WITH RESEARCH AND INNOVATION

2009 EPA P3 Award Winner

Providing power to developing nations is quite a challenge – one which an EPA People, Prosperity and the Planet (P3) Award student team decided to overcome. A team of graduate students, including Amy Mueller and Matt Orosz at the Massachusetts Institute of Technology (MIT), are researching novel solar thermal micro-generators, solar collectors, and “ORC” (Organic Rankine Cycle) engines to provide renewable energy to Lesotho, a land-locked nation in South Africa.

The thermal micro-generator project started in 2004 with the design and construction of prototype solar collectors that were installed and tested in January 2005. Supported by the World Bank and Development Marketplace, subsequent collectors were developed in 2006, with a full-size version installed at Bethel High School, Lesotho, in spring 2007.

EPA’s P3 Award funding (for a total of \$85,000) and other sources have enabled the team to continue developing their system. Currently, the MIT team is refining their design for an ORC engine that will convert heat to electricity using solar panels to provide the energy to drive the engine. When completed, this solar thermal micro-generator system will be deployed to the Ha Qadi clinic in Lesotho to improve medical services by providing more than 3 kilowatts of electricity and hundreds of gallons of hot water daily. The hope is that this is the first step in a program that



will provide renewable energy to rural institutions like clinics and schools, promote local economies, and improve people’s quality of life.

Total EPA Investment
\$85,000

Return on EPA Investment
Power and hot water system will be installed for a medical clinic in Lesotho.



OTHER AWARDS:
ASME IShow 2nd Place
National Collegiate Inventors & Innovators Alliance Award
2009 Fullbright Scholar
MIT 100K 20 Year Award

OTHER LINKS:
EPA Project reports:
<http://www.epa.gov/ncer/solarthermal>
STG International:
<http://www.stginternational.org>
EPA P3 site:
<http://www.epa.gov/P3>

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