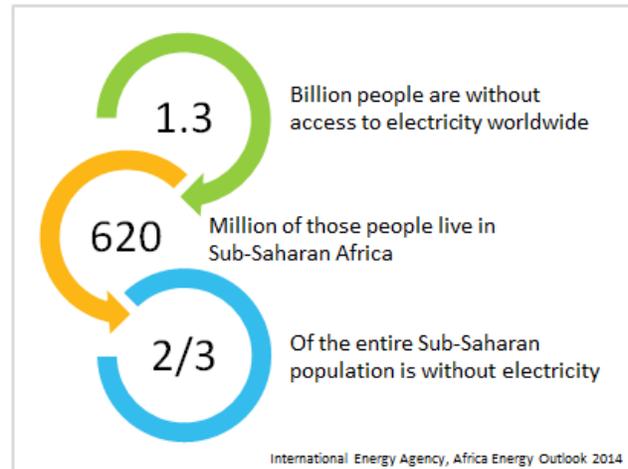


The Smart Village Microgrid Laboratory

Colorado State University is building a Smart Village Microgrid Laboratory for developing robust microgrid systems for rural electrification in developing nations and we invite your participation as a partner to create positive and lasting energy solutions.

The Need

Throughout the developing world, many rural populations have no easy access to electricity, resulting in the need to travel long distances to charge cell phones and purchase batteries. Inhabitants of these areas report that indoor lighting and cellphone charging to be the most desirable application for in-home electrification. Presently, lighting is often obtained through kerosene lanterns, which burn costly fuel and produce dangerous combustion emissions. High-efficiency microgrid technologies with renewable generation sources can electrify remote villages, bringing improvements in quality of life, health benefits, and economic opportunities to the inhabitants.



Our Lab



The Energy Institute of Colorado State University is taking major strides to address these issues. Through the creation of a Smart Village Microgrid (SVM) Laboratory at the Powerhouse Energy Campus, the Smart Village Microgrid Team and participating partners, will be able to gain a deeper understanding of village level electrification. This laboratory will model a remote village with plug & play technology to allow for the testing of various microgrid products.

The desire to create robust modular microgrid systems is reflected in the flexibility of the design and layout of the SVM Lab. The lab is configured to accommodate a variety of research activities on microgrid subsystems like metering and grid management, and other electromechanical areas like battery performance characterization and power generation integration. The SVM Lab will contain six experimental cells, each with a dedicated 60 kW power feed and access to various infrastructure systems like transformers, photovoltaic simulators, and internal combustion generator sets.

An independent internal power grid will enable electrical interconnection of multiple cells for multiple power generation or distributed load scenarios. Safety of students and research partners will be assured with thoughtful design of lab systems, access restrictions on high-power elements, an extensive training program, and rigid Lock-Out-Tag-Out protocols.

Design and development of the Smart Village Microgrid Laboratory is proceeding rapidly under the oversight of a Postdoctoral Research Engineer. The design of the Village Modules will simulate the

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electrical load of approximately 150 homes. At a minimum, each home will contain a meter, a cell phone with charger, and LED light bulb, as pictured. Design activities have and will continue to incorporate input from SVM Team Members, research partners, and industrial collaborators.



Join the SVM Team

The SVM Laboratory is housed in the Electric Power Systems Laboratory (EPSL) of the Powerhouse Energy Campus, making it the perfect location for energy development and testing. Not only is our facility suitable for energy development, but our position within the academic and energy community also has a very positive influence on project development. The Energy Institute prides itself on being the nucleus of research, education, and outreach for the faculty, staff, and students of Colorado State University. Student involvement is

important to the SVM team and we intend to have students from abroad contributing to this project as well. By working in our lab, partners will have a direct link to the dependable and interdisciplinary resources that this institute has to offer.

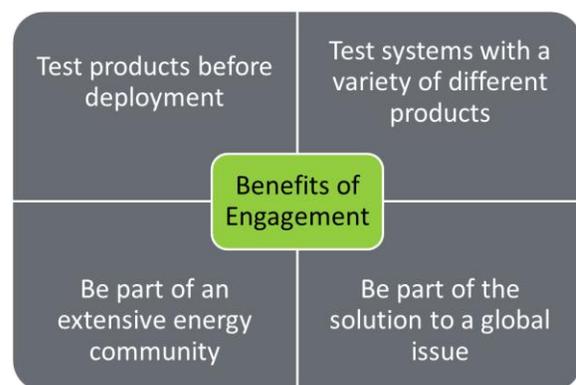
Our lab is not complete without products and energy developers to fill it. We are looking for a variety of partners who are interested in the results found in this laboratory.

You may wish to be engaged in our project if you fit into one of the following categories:

- You are **creating microgrid technology or products** and wish to test them at our facility
- You are attempting to purchase products from another company and you wish to **test products and integrate devices into a microgrid system**
- You are **interested in the social progress of global issues such as energy access and rural development** and wish to be involved in a project that can directly address these pressing issues

Your Role

As a partner of the Smart Village Microgrid project we hope that you will bring passion and innovative ideas to our laboratory. Partnership will include donating the equipment you wish to test and a testing fee to cover the cost of testing. These requirements will give you access to our lab facility and cooperation with our innovative Smart Village Microgrid team.



We invite you to contribute your experience, ideas, and development to help create broad and influential change through the Smart Village Microgrid project.