



## **Humboldt State University Innovation Credit Letter**

Dear STARS Innovation Credit review committee,

Please accept this letter in support of the STARS Innovation Credit submission for Humboldt State University's International Collaborations in the Dominican Republic and Bhutan.

I am a professor in the Environmental Resources Engineering (ERE) department at Humboldt State University and I also serve as Chair of the department. Both collaborations involved work by faculty and students associated with the ERE program.

**BHUTAN:** A Humboldt State University team, composed of Environmental Resources Engineering undergraduate and graduate students, related faculty, and Schatz Energy Research Center engineers, has enabled a small community of rural electricity users to stabilize their isolated renewable energy mini-grid and curb brownouts by installing GridShare "smart grid" devices in Bhutan. The GridShare devices, which were designed and made by HSU students, allow residents in the village of Rukubji to monitor their electric system and adjust their use of large appliances to maintain a more reliable electric supply for the entire village. A display in each resident's kitchen provides information about the status of the grid and notifies users when to limit their use of high-power appliances. The GridShare further enforces this limit by temporarily cutting power to a household that attempts to use a high power appliance such as a rice cooker or water boiler during brownout conditions.

While in Bhutan, the Humboldt State team conducted an extensive outreach program to educate the Rukubji community about Grid Shares and discuss ways to manage their electric power consumption. The Humboldt State team made bilingual posters and pamphlets, hosted community meetings, conducted in-home visits and led educational programs for students in the schools. To fund this project, HSU's Renewable Energy Student Union won two grants in the People, Prosperity and the Planet (P3) design competition from the U.S. Environmental Protection Agency. The initial grant was for \$10,000 to develop a prototype device. The second grant was for \$75,000, and it funded implementation of the pilot installation in the village of Rukubji. This initial pilot project was successful and demonstrated the potential for innovative demand-side management strategies, like the GridShare, to improve the quality of electricity provided by isolated renewable energy-powered mini-grids. After one year of operation, severe brownouts had been reduced by over 90% on the Rukubji mini-grid system. The project involved collaboration with the Bhutan Power Corporation, the Bhutan Department of Energy, and the village of Rukubji. More information is available at <http://www.schatzlab.org/projects/developingworld/gridshare.html>



**DOMINICAN REPUBLIC:** A diverse team of Humboldt State students and Dominican students collaborate with a Dominican University (UNIBE), a local architecture group (Colectivo Revark), and local communities to develop and build appropriate technologies through the Practivistas Program. The Practivistas Program directed by ERE faculty member, Lonny Grafman, has worked with ERE, non-ERE students, and community members in Mexico for five years and in Dominican Republic for two years building and sharing appropriate technologies. Past projects include improved cookstoves, rainwater catchment systems, adobe homes, solar vaccine refrigeration, biogas digestion, and more. These initiatives are developed and shared through community meetings and online.

In Summer 2011, Humboldt State students studied appropriate technology and Spanish while working with community members of La Yuca to build a schoolroom from plastic bottles and cement, lit with solar and homemade wind power from bike parts and industrial waste, that catches its own rainwater for cleaning and drinking. In Summer 2012, students returned to Dominican Republic to continue the learning and community collaboration. Students worked with community members of La Yuca to make the renewable energy system more hurricane safe and durable, and to make the rainwater catchment more potable and tested. In addition, students worked in Las Malvinas to design and build a classroom from plastic bottles, cement, sawdust, papercrete and industrial wood waste for 25 grade school students. More information is available at <http://www.practivistas.org>.

I have reviewed the STARS Innovation Credit criteria, and I can say with confidence that these international collaborations meet the requirements.

Please do not hesitate to contact me if further information is needed.

Sincerely,

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