The DC-HEaRT Initiative and the Catalytic Community Center

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The central and globally relevant focus of the DC-HEaRT initiative is a catalytic community center (CCC). The intent is to employ the intrinsic advantages of DC power to respond to the needs of communities across the world. The challenge is to do so in an economically sustainable fashion that attracts investments by business organizations.

Utilizing DC power to improve the quality of life and promote entrepreneurial activity, the CCC would be custom-designed for each community context, from the most disadvantaged communities in emerging countries—like off-grid villages in India—to distressed communities in advanced, industrially developed countries.

In locations such India, Haiti, Botswana and Guatemala, the CCC would be designed, built and offered— as one of our partners, Elliot Fabri Jr. of EcoCraft Homes, described it—as a "community-in-a-box." We plan to ship it out, as a CKD unit, in a 20-foot container to the site. The container itself would be designed to serve as a community meeting place, classroom, and health clinic. The intent of the CCC is twofold. First, to improve the quality of life for the community in an economically sustainable manner that would guide and motivate firms' investment in similar CCCs. Secondly, to promote economic activity and income for the community.

For the first CCC, located in India, in the northern part of Gujarat State, in light of these two objectives, the plan is for the container to include:

PV (solar) panels
A controller and batteries
Computers and large monitors

For entertainment and literacy programs

An internet connection
A telemedicine unit
A frugally-designed water purification unit using simple sand filters and LED UV lights
Two sanitation demonstration units
A DC-powered green house (with LED lighting and ventilation)
Extra DC power to support entrepreneurial ventures; the initial thinking is to promote:

Greenhouses for profitable produce
Building and selling smokeless cooking stoves
Building and selling inexpensive household water purifiers using UV LEDs

In the U.S., EU, and possibly the West Bank, the intent is to build the CCC on the foundation of an existing community facility. In the Homewood area of Pittsburgh, the CCC is planned to be an extension of an existing triplex of houses that supports community activities of the Bible Center Church. The initial entrepreneurial activities in Homewood are two custom-designed greenhouses that employ DC power from solar panels. One greenhouse is off-grid. The second will have a back-up connection with the AC grid. This AC backup is because the second greenhouse is intended to be an aquaponics unit that supports a symbiotic combination of fish and hydroponically grown produce. The connection to the AC grid is to ensure that temperature fluctuations fatal to the fish—which are sensitive to variations of a couple of degrees—do not occur during extended periods of cloudy, winter weather.

Additional entrepreneurial activity that is planned for Homewood includes converting AC appliances to run on DC[2], and making DC-related hardware.

The initial plans for Homewood and for Gujarat were developed by students in the Business of Humanity® course[3] which is an MBA elective open to graduate students from all the schools at the University of Pittsburgh.

In future blog postings, we will outline our initial plans for bringing DC power to the triplex; following up with other buildings to create a DC micro grid spanning several buildings in Homewood.

[2] Graduate engineering students in an elective course on product development will be working on the procedures for the conversion for several commonly used appliances

[3] The three-credit course, BSPP 2328 The Business of Humanity®: Strategic Management in the Era of Globalization, Innovation and Shared Value has been offered in the U.S., India and Brazil, primarily for MBA and Executive MBA students. Students from several other professional schools, especially engineering, have taken the course.