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Umbrella for the Sun: Imagining the Future of Student-Run Rural Electrification Projects

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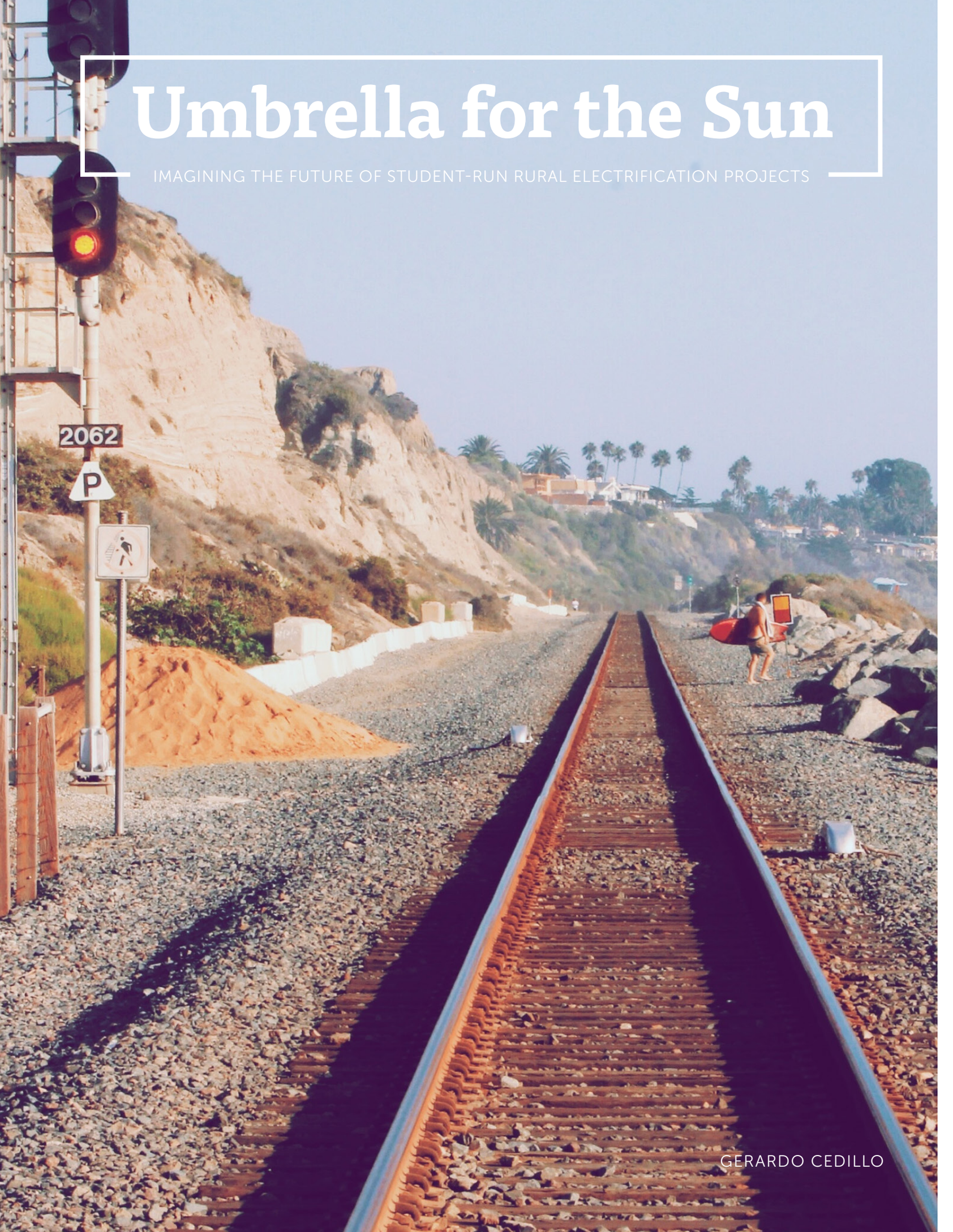
IMAGINING THE FUTURE OF STUDENT-RUN RURAL ELECTRIFICATION PROJECTS



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Why sustainable rural energy?

With the ever-decreasing availability of resources in the world, energy has become an international concern. The United Nations, for instance, designated 2012 as the International Year of Sustainable Energy for All and launched Sustainable Energy for All, an initiative that aims to "make sustainable energy for all a reality by 2030."[1] Some groups have also suggested that energy should be considered a human right, along with life, food, and education, since they claim that these three human rights can only be reached if energy is available to everyone.[2]

This trend has permeated into community service groups, which have assimilated the concern for universal energy availability into their own goals. Thus, NGOs like Engineers Without Borders have started projects in which electrical power technologies are taken to rural areas. These groups have focused on developing communities in Africa, Asia, and South America, where they either collaborate with the local governments or start a new project with a community of their choice.

In particular, developing areas (Africa, South and South East Asia, and Latin America) possess vast resources, such as sunlight, wind, and water, though not necessarily in a consumable state. This allows the rural energy projects to include a sustainability component: sustainable energy technologies make the most out of community resources while following up with the global concern for energy availability through sustainable practices.

> ***"Sustainable energy technologies make the most out of community resources while following up with the global concern for energy availability through sustainable practices."***

SUSTAINABLE
ENERGY FOR ALL

Sustainable Energy for All *is a United Nations initiative to bring together leadership from all sector of society to increase the efficiency and provide access to sustainable energy.*

Where do student-run rural energy groups come from? How do they work?

College students around the world have also become interested in sustainable rural energy, mainly rural electrification, and have shaped their ideas into student-founded, student-run environmental and community service groups. Although developing countries have a wide variety of resources, student groups tend to prefer solar energy when working on their rural electrification goals. Usually harnessed through either photovoltaic or thermal technology, solar energy requires a relatively small amount of research, investment, and maintenance. As a result, many student-run projects aim for installing photovoltaic cells or solar ovens in small communities.

Student groups interested in rural electrification are widespread and can be found in many universities, giving opportunities for students to be involved in environmental sustainability and leadership positions. However, being independently run, some groups have trouble finding sponsors. Since most rural energy projects are sustained by student initiatives, their outreach and effectiveness fluctuate as different student generations come and go through college. These projects are usually considered to succeed whenever a developing community receives solar technology and starts making use of it, once the student group has installed it. Nonetheless, this is not quite a full success. Lacking technical expertise, the beneficiaries can only provide low-quality maintenance, if at all, to the solar energy equipment, resulting in a de-

[1] http://www.sustainableenergyforall.org
[2] http://www.bobfreling.com/2012/01/energy-is-a-human-right-the-hi.htm

***Power Up Gambia** is working to provide rural health clinics with solar suitcases that contain photovoltaic panels, outlets for charging laptops for medical consultation, and foetal heart monitors.*

cline in efficiency as time progresses. Not much time is required for the system to fail, giving the community no other choice than to utilize fossil fuels. This defeats the initial goals of environmental student groups and the global concern for sustainability.

Power Up Gambia: the intersection of health care and rural electrification in student-led initiatives

In 2006, after a summer of volunteering at the Sulayman Junkung General Hospital in the Gambia, Kathryn Hall, a pre-med student at the University of Pennsylvania was deeply moved as she witnessed the lives of people being put in danger due to the lack of a reliable energy supply in the hospital. Patients were not able to receive life-saving procedures, as these were performed only when electric power to run essential medical equipment was available. With the idea that increasing access to health care can be attained only through sustainable practices, Hall and a group of collaborators formed the organization Power Up Gambia (PUG), which now has chapters in different universities in the US. In particular, the PUG chapter at the University of Pennsylvania draws students mostly from Penn's School of Medicine, but has an undergraduate pool of students.

PUG was able to raise $350,000 for the installment of 114 solar panels and 6 tracking units to power water pumps and other electrical equipment in the Sulayman Junkung General Hospital in 2009. More recently, the group launched the Solar Suitcase Health Clinic Project[3], which in collaboration with the local Gambian government aims to provide highly efficient solar energy systems. Each of the solar suitcases costs $2,500 US dollars and provides communication and vital sign measurement solutions for rural health clinics that do not have access to the electrical grid.

> ***"Since most rural energy projects are sustained by student initiatives, their outreach and effectiveness fluctuate as different student generations come and go through college."***

[3] http://www.powerupgambia.org/projects/solar-suitcase-health-clinic-project

> ***"Umbrella rural electrification organizations can provide enough networks to avoid losses due to lack of maintenance, funding, and, most importantly, teamwork."***

How can umbrella organizations ensure the long-term success of student-led rural electrification projects?

The main issue with rural energy student-led projects is their discontinuity in both time and structure. The work of each group member usually ends when the student graduates and passes the project onto the next class of group members, which is also partially emptied and replenished every year. Power Up Gambia, for example, continuously faces cyclic changes in membership; its undergraduate component is not currently active anymore. Simultaneously, several groups in different universities (or sometimes even within the same university) have the same goal, but work separately, splitting opportunities for funding, workforce, and creativity.

Therefore, we need to establish an overarching organization that coordinates student attempts to take solar and other energy technologies to developing communities, so that: (i) the overall workforce availability is not split among different groups; (ii) funding from sponsors may be gathered and used in a carefully planned manner; (iii) the long-term need for equipment maintenance is satisfied by designating groups to do so; and (iv) all fresh ideas for rural energy improvement and innovation are developed in a larger team with a wider variety of potential specialists.

Although specific details about the structure or hierarchy of this hypothetical umbrella organization would still need to be determined, it is evident that permanent group members are needed to ameliorate the issues that the constant student flow causes. Such members would ideally be students that decide to work for a NGO after graduating, but ex-employees of other NGOs would also be helpful. The principal objective of this is to bring some solidity to the structure of the umbrella organization.

Even though it is already gratifying to have students motivated to provide energy technologies to developing communities, there still needs to be more planning and coordination among student groups. Umbrella rural electrification organizations can provide enough networks to avoid losses due to lack of maintenance, funding, and, most importantly, teamwork.