

service providers. The fact that utilities now have local headquarters has also given protestors an easy-to-reach target. Technical problems with decentralization have also arisen due to difficulties coordinating between different tiers of government and the lack of economies of scale. In addition, smaller-scale systems have made it more difficult to subsidize the rates of poor consumers. These failures of decentralization have contributed to the failure of insulation as well: politicians facing street protests still pressure service providers to keep rates below the cost-recovery level. And, despite reformers' good intentions, patronage appointments continue to be common.

When asked during the question-and-answer session whether the reforms had lowered the number of unregistered customers, Post referred again to the Argentine example. While privatization was eventually reversed in most communities, during the 10- to 15-year window when private companies provided services, they had strong incentives to update the records, and they employed methods such as aerial surveys to make sure all their customers were on the books. She also noted that one

study found that Argentine child mortality rates declined more rapidly where systems had been privatized.

In sum, the conflicting rationales behind the 1990s-era reforms have led to mixed results. Despite efforts to insulate utilities from political pressure, elected officials still intervene in utility management. Likewise, efforts to increase customers' willingness to pay for needed infrastructure upgrades through decentralization have foundered due to public unrest and local protests. Meanwhile, the key to disrupting Latin America's pernicious low-level equilibrium remains elusive.

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VIDEO AVAILABLE AT CLAS.BERKELEY.EDU

A city worker delivers a weekly water ration in a low-income Mexico City neighborhood.



Photo by Eduardo Verdugo/Associated Press.



Photo courtesy of blueEnergy.

Outhouses draining untreated waste into waterways, Nicaragua.

WATER

## Powering Rural Development

by Jess Joan Goddard

**B**luefields is the capital of the poorest department in the second-poorest country in the Western Hemisphere: Nicaragua. Located on the country's Caribbean coast, Bluefields is both geographically remote and economically marginalized. A lack of roads limits entry to those traveling by air or by sea, and residents lack access to many basic services. As a child, Mathias Craig, the executive director and co-founder of blueEnergy, accompanied his mother, an expert linguist, on research trips to the region's indigenous communities. Dedicated to helping improve the poverty-induced conditions he experienced there, Craig kept returning to the same question: "How do you put together a suite of solutions that can help change lives?" blueEnergy is the solution he came up with while still a graduate student at the Massachusetts

Institute of Technology. The nonprofit's mission — "to work for a more equitable, sustainable world" — reflects both Craig's early preoccupation with social justice and the organization's ambitious approach to development.

For Craig and blueEnergy, the last 10 years have been marked by a deepening engagement with Bluefields. The organization focuses on holistic community development and the provision of basic services like energy and water. Thus far, they have provided services to 10,000 people in more than 18 communities. According to Craig, blueEnergy is "defining a different development path, and defining it with [Bluefields]."

Introducing the nonprofit's renewable energy program, Craig reminded the audience that "it's easy to take for granted the role that energy plays in our lives." Plotting annual

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per capita electricity consumption against the Human Development Index, a United Nations proxy for human well-being, reveals a non-linear trend. Referencing the graph, Craig noted: “When you go from no energy to a little bit of energy, the quality of life can increase dramatically.” blueEnergy uses locally manufactured wind and solar power technologies to provide this little bit of energy to isolated communities and institutions, working collaboratively with them to provide technical training that ensures the success of their new technologies. One important application is providing electricity for the refrigeration of medicines, an essential improvement for a community like Monkey Point that is a four- to six-hour motorboat ride away from the nearest hospital. Before blueEnergy installed solar panels at the local medical center, staff were limited in their ability to save patients from preventable diseases because they were unable to store medicine properly.

In recent years, blueEnergy’s awareness of community needs led to the development of a water and sanitation program. Worldwide, waterborne illness is the second leading cause of death for children under five. Craig is committed to improving the entire spectrum of water consumption in Bluefields. blueEnergy seeks to create

access to clean water by drilling wells, providing biosand filters, constructing latrines, and teaching safe sanitation practices. These innovations are accompanied by community involvement, training, and education. Craig stressed the importance of using technologies that have worked elsewhere in the world. blueEnergy works with preexisting manufacturers to adapt proven technologies to meet the specific needs of Bluefields residents. This collaboration allows for strong partnerships and a higher probability of success when introducing new technologies.

For Craig, the individual projects of energy provision, water services, and latrine building together lead to a unified perspective on development: “If you zoom out and look at the bigger picture, a lot of the opportunities around economic development in an area require an intersection of multiple sectors.” blueEnergy sees the nexus of water and energy as crucial to securing the well-being of marginalized communities. Using solar-powered water pumps in conjunction with biosand filters, blueEnergy has worked on integrated systems with farming cooperatives and agroforestry centers.

In designing unified energy–water systems that enhance communities’ capacity to manage their health

Installing a solar panel in Rocky Point, Nicaragua, May 2012.



Photo courtesy of blueEnergy.

and food security, blueEnergy has developed a fourfold approach to holistic community development. First, Craig reiterated the organization’s commitment to community engagement. blueEnergy is not just a technology provider, he said. Rather, the organization encourages communities to play a critical role in the acquisition of basic services. Second, blueEnergy partners with local educational institutions to provide complementary technical training. Setting the foundation for local empowerment through education and capacity building has proven essential to technology adoption and best practices in the region. Third, the organization values its services and products in ways that allow for community buy-in without prohibiting access. Recipients are required to make a financial contribution, participate in a day of training, and/or provide a day of labor so that they feel a sense of ownership of the services and technologies. Finally, blueEnergy is working as a partner to Bluefields to develop a long-term view for development in the region.

blueEnergy’s Global Leadership Program is another facet of the organization’s long-term plan. The goal is to train the leaders of tomorrow by providing international students with field experience in the developing world. Volunteers take part in technical training and community development initiatives in Nicaragua. blueEnergy aims to educate students through hands-on fieldwork and to encourage them to carry forth a commitment to “a more equitable, sustainable world.”

Mathias Craig and blueEnergy are working to synthesize a unified solution to the provision of basic needs with a holistic community approach. Adapting existing knowledge and technologies to address specific



Photo courtesy of blueEnergy.

A young girl watches a water filtration unit in action.

local needs is a hopeful model for development in poor, marginal regions in Bluefields and around the world.

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