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The decades-old problem of stymied development in Africa caught the world’s attention in the 1980’s as horrific images of starvation in Ethiopia filled TV screens and periodicals. Stories about food aid rotting on the docks due to lack of transportation got petroleum engineer Ben Ebenhack thinking about how access to modern energy could facilitate famine relief efforts and development in general. Through his work in assessing energy supplies worldwide, Ben knew that energy resources exist throughout the developing world—and also why they were being overlooked by national and multinational energy companies.

Ben was convinced that energy could be produced using local resources for the benefit of local people, and began exploring how he could mount an effort to do so, recognizing that he would need enabling partners with expertise beyond his own.

In 1986, the Frederick Douglass Institute for African and African American Studies was being formed at the University of Rochester. Dr. Karen E. Fields, the Founding Director, brought with her a desire to include innovative projects with the potential for real application in Africa. In 1987, she invited Ben to work with the Institute’s social scientists to evaluate the potential for localized energy projects.

As the initiative moved toward defining how operations in Africa would be carried out, the University of Rochester advised that a separate entity be incorporated to manage the venture: one that was housed on campus and able to benefit from the expertise within academia, but having its own mission and goals. With the help of the University of Rochester, the AHEAD Energy Corporation was chartered in 1988 as a public charity.
Evolution

AHEAD’s approach to developing energy services in Africa evolved over time as information was gathered about economic realities, cultural preferences, and environmental constraints surrounding the pressing need for Africans to access alternatives to firewood. University of Rochester students who enrolled in Institute classes and served as AHEAD interns played an important role in this progression.

Our initial focus, developing Africa's natural gas resources, has evolved into optimizing "energy mixes", i.e. hybridizing multiple technologies to meet a variety of energy needs. When possible, installed systems have the capacity to transition toward future technologies with increasingly smaller negative impacts on the environment. Thus, AHEAD began collecting information on a broad range of energy resources, technologies, distribution systems and business approaches. Of particular concern was the development of appropriately scaled projects – large enough to bring about systemic change but small enough for locals to operate.

First Project

A grant received from the proceeds of the 1985 Live Aid concert enabled Ben Ebenhack and Karen Fields to make a trip to Mozambique in 1991. There, they discovered an effort to provide electricity to the town of Vilankulos, population 60,000, that was stalled by project developers’ inability to afford the installation of standard gas transmission infrastructure. Natural gas from a proven field needed to be transported 100 kilometers and linked to an existing electric grid. AHEAD provided information on an alternative gas pipeline technology, which was adopted and resulted in the project’s completion. Not only was the Town of Vilankulos electrified, but services were subsequently extended to neighboring towns and even to an offshore island.
As the new millennium dawned, concerns about sustainable development, climate change, and energy security came to the fore. In 2002, delegates at the World Conference on Sustainability in Johannesburg declared for the first time that development could not be achieved without provision of adequate modern energy.

Recognizing that energy is an enabler and not an end in itself, AHEAD strives to connect people with practical solutions; Circle of Peace School in Uganda is a case in point. At this nursery and primary school, energy is needed to cook meals; to pump water; to heat water for bathing, cleaning and laundry; to light classrooms; to refrigerate food; and to run electronics and appliances. No single energy resource or technology meets all needs. By installing a hybrid energy system (clean efficient stoves, PV solar panels, solar thermal water heaters, a biodigester, and mechanical pump), AHEAD has increased opportunities for learning, improved the health of students and staff, relieved the drudgery that lack of access to energy entails, and set the School on a more secure financial footing – all while safeguarding the environment.

The AHEAD Team

Our team brings well over a century of professional energy/development experience and a broad understanding of energy systems – their advantages, limitations and how they can complement one another. AHEAD’s ability to compare, evaluate and combine resources and technologies provides a full palette of energy solutions.

Relocated to the Bernhard McDonough Center for Leadership and Business at Marietta College in 2010, AHEAD taps the expertise of the Center and the College in carrying out its work.
The AHEAD Approach

Focus on African Schools and Medical Facilities

AHEAD focuses on assisting established schools and medical facilities in Africa to improve their energy systems. In turn, these community institutions expose the wider community to viable energy systems, thereby spurring entrepreneurial energy development.

Local Use of Local Resources

AHEAD projects tap local energy resources for local use, not for export to other countries. We assist in providing more sustainable energy services in places that traditional market-driven approaches ordinarily bypass. Rural areas are particularly challenging, not only because these populations tend to be poorer than urban areas, but also because they are spread out, requiring decentralized approaches.

Resource Neutral, Decentralized Energy

Energy generation occurs over a range of scales, from a single solar panel producing tens of watts, to a coal-fired power plant or hydropower dam producing over a billion watts. Large centralized projects can provide abundant life-transforming energy for many people but are often difficult to control, operate, and maintain locally. These systems concentrate power in the hands of a few and tend not to serve poor and rural areas. Furthermore, they lose significant portions of the energy they produce in transmission and system defects. AHEAD assists in establishing decentralized systems that use various energy resources in an efficient manner -- all locally owned and operated.

Optimization of a Range of Resources and Technologies

Applications and client preferences set the stage for AHEAD’s work. If cooking is the dominant need, combustible fuels are more likely to be accepted and more practical than electricity. Lighting and refrigeration are generally best provided by electricity, while it is absolutely essential for telecommunications, computing and other high-end needs. Transportation requires dense energy storage, sufficient to provide adequate travel range.

Collaboration

Trust and respect are at the heart of AHEAD’s work with clients. We develop solutions to needs defined by our client. This ensures both contextually-appropriate solutions and effective transfer of technology. In this way AHEAD projects develop human resource capacity in Africa’s energy sector.
Our Services

**Site Assessment**

Projects begin with clients providing AHEAD with information on their current energy uses and needs. This is followed by a site visit to investigate desired energy applications, available resources, and viable technology options.

**Energy Applications and Constraints Identification**

AHEAD works with clients to fully understand both their needs and their constraints. AHEAD staff solicit input from all stakeholders about what is working well with their current energy systems and what improvements they would like to see. AHEAD seeks to remain up-to-date with current energy practices and systems, as well as what constrains progress toward energy enhancement. Factors such as culture, finances, scale, demand, environment, accessibility, and technical expertise are taken into account.

**Resource Assessment**

Prior to a visit, the AHEAD Team gathers regional-scale data on solar, wind, water, geothermal, biofuel, and hydrocarbon potential. Based on these preliminary findings, we take measurements to gather specific information to determine the most promising energy resources for the site. Given that some resources diminish over time, current resource capacity is assessed along with long-range forecasts.

**Technology Optimization**

AHEAD maintains a growing database of small-to-medium-scale energy generation and distribution technologies. We employ a winnowing rubric to eliminate the least practical solutions based on application and resource assessments, leaving a manageable number of technologies to consider. Often a combination of resources and technologies is needed to meet a range of energy applications. All technologies are chosen with consideration focused on ensuring sustainability and minimizing negative environmental impacts.
Our Services (continued)

Project Management

After creating a site assessment report, the AHEAD Team works with clients to develop a plan for acquiring the needed supplies, installing equipment, clarifying operations, and planning for the future.

Supplies, Equipment, Installation

AHEAD works with clients to solicit and evaluate bids from vendors. Though arrangements can be made to import materials and expertise from abroad, AHEAD prefers to purchase equipment and services in-country. This is part of our commitment to support development generally rather than isolated projects. AHEAD oversees installation and ensures that locals understand how to service and repair their energy system. We also ensure that replacement parts are available. AHEAD can work with clients on identifying possible funding sources.

Operations Management

AHEAD works with clients to decide who will own, operate, and maintain their system and how energy will be equitably distributed.

Ongoing Consultation and Advisement

AHEAD stays in touch with clients to address unforeseen needs and convey knowledge of advances in technology. We have maintained relationships with colleagues in developing countries, some going back as far as 20 years.

Kleen Kuk Stove LPG project
**Our Vision:** A world in which universal access to energy as well as its wise stewardship enable all people to attain a high quality of life on a thriving planet.

**Our Geographic Focus:** Africa – currently the continent of greatest need.

**Our Mission:** To assist schools and medical facilities to get the energy they need in an economically-sustainable, environmentally-conscientious manner.

Join us in assisting African communities to move up the “Energy Ladder.”

AHEAD Energy is a registered nonprofit corporation in the United States of America, EIN number 22-3018053.

Donations are tax-deductible as allowed by law.
Success Stories

**Circle of Peace School**

AHEAD has been working with this family-run primary school in Makindye, Uganda since 2009 to upgrade its energy and sanitation systems. Two twin-burner “Rocket Stoves” have been installed in the kitchen. Electricity is being supplied by a solar photovoltaic system. A rainwater harvesting system has been installed with a foot pump. A science curriculum for grades 5 — 7 has been introduced that teaches the technical aspects of energy production and how the renewable energy systems at the School work.

**Kagando Rural Development Center (KARUDEC)**

In 2009, AHEAD entered into a partnership with KARUDEC located in the Kasese District of Uganda, to explore alternatives for generating electricity. In addition, AHEAD has introduced efficient cook stoves and hot water heaters. There are 1500 residents at KARUDEC providing medical care, education, and economic assistance to 150,000 people.

**Chazon Children’s Center**

This private school in Molo, Kenya educates 300 children in grades 1 through 8. AHEAD helped the school obtain a foot pump to irrigate crops grown at the school. Six wind turbines manufactured and donated by Jetpro Technology provide electricity for lights and computing.
Thank you, AHEAD Energy!