

SOCIAL BUSINESS DEVELOPMENT OPPORTUNITIES

Analysis: The Energy Sector in Low Income Countries

ENERGY NEED: AT THE LAST MILE AND BEYOND

In low-income countries, where the majority of people live in rural communities, there is a significant lack of affordable, safe, and reliable energy to support basic living requirements. Today, an estimated 2.4 billion people rely on biomass for their primary source of fuel, resulting in deforestation and dangerously polluted home environments.

Historically, there have been few options: nearly 1.6 billion people worldwide live beyond the electrical grid, in remote, last mile communities. Many have insufficient access to cleaner and more modern fuels such as kerosene, propane or natural gas. However absolute shortages of cleaner and more practical fuels do not adequately define the energy gap. For many low-income countries, weak supporting financial and transportation infrastructure are the primary barriers limiting distribution and availability of these fuels.

The benefits of more practical and safer fuels extend well beyond basic quality of life improvements: community wellbeing and commerce are both enhanced and sustained with improved access to higher quality forms of energy.



VILLAGE REACH

Many developing countries face significant infrastructure gaps that severely limit the performance of their health systems and economies. VillageReach's programs strengthen health systems - especially in remote, last mile communities - by addressing these critical infrastructure gaps. Three infrastructure sectors comprise the main focus of VillageReach's programs: energy, transportation/logistics, and communications/IT. VillageReach partners with public and private sector health programs to deliver two interconnected parts of the health systems strengthening (HSS) model:

- ◆ Field programs that expand access to healthcare at the last mile by evaluating and improving logistics and providing infrastructure support services.
- ◆ Creation and management of social businesses that increase the performance of the health system by producing sustained improvements to critically important infrastructure.

The creation of social businesses supports VillageReach's field programs, while also enabling other development programs run by governments, non-governmental organizations (NGOs), private corporations, and multi-lateral aid agencies. As social businesses become increasingly profitable they boost the local economy and attract the attention of investors seeking opportunities with financial and social returns.

ENERGY ALTERNATIVES

EVALUATING ENERGY OPTIONS

VillageReach conducts assessments of energy options in low income nations and identifies opportunities for the creation of social businesses. VillageReach's analyses include evaluations of energy cost and market structure, and estimates of reliable supply and sustainability.

In much of the developing world, nationwide energy infrastructure is inconsistent: millions continue to rely on biomass – wood and charcoal – as their primary source of energy.

While electricity has had a presence for decades, reliability is a key challenge: blackouts and brownouts present a major obstacle for mission-critical activities, especially for healthcare. Many countries serve only a portion of their populations with electricity: in Mozambique, for example, only 8% of the country is connected to the electrical grid. For the 80% of the population living in rural areas, electricity is not an option. The following energy sources are potential investment opportunities that provide significant economic, health and social benefits to poor communities.

☑ **Liquefied Petroleum Gas (LPG)**, commonly known as propane, has emerged as a priority fuel advocated by development agencies such as the United Nations Development Program (UNDP) because of its clean-burning benefits to health and the environment, and its high utility for a variety of applications that promote economic development.

Advantages: portable, easily distributed to rural areas, has potentially broad market demand (powers large-scale equipment used in industry), poses less of a health risk (cannot be ingested), difficult to tamper with or pilfer unless the entire container is taken.

Challenges: relatively high initial investment for equipment – cylinders, cooking stoves, lighting; establishing reliable supply chains and networks of dealers; sourcing financing support (e.g., microfinance institutions or MFIs).



Propane filling station

☑ **Kerosene** is found in virtually all larger towns and population centers in Africa. Kerosene-powered equipment, such as refrigerators and lamps, is often the only available fuel alternative to biomass in rural health centers.

Advantages: broad availability, relatively low cost, easily portable and stored.

Challenges: erratic and unpredictable supply in rural areas, variable quality, potential health hazards include accidental ingestion and air pollution, (ingestion of kerosene is the most common cause of acute childhood poisoning in most low-income countries; lamps and stoves emit air-borne pollutants that can lead to respiratory and immune system diseases), high incidence of tampering and pilfering.

☑ **Solar** (photovoltaic) power has only recently generated consideration as a viable energy alternative for the developing world. The industry is experiencing rapid product development as a result of new investments and innovations in low-income countries. The requirement is to translate this progress for the benefit of the billions at the base of the pyramid.

Advantages: highly adaptable for most low-income countries based at the equator [consistent, year-round access to sun], with no recurring energy costs.

Challenges: very high capital investment [solar equipment and power storage]; stringent physical and environmental requirements for placement and installation; reliability subject to weather conditions; high potential for equipment theft; high costs of importation; requires reliable and potentially high-cost supply chain of equipment, spare parts, and service.



☑ **Other renewable energy sources**, such as wind, hydro and biofuels are viewed as potential future solutions for the energy needs of rural health centers. Generators powered by renewable energy sources provide power for refrigeration, lighting, heating, and office and communications equipment to enable telemedicine in even the most remote locations.

The challenges of establishing such systems, however, are significant and tend to limit renewable energy solutions to organizations capable of managing the entire operation, such as large agricultural operations using their own plant refuse to produce biofuels or small home systems that power lights and cookers. Such programs face significant technology hurdles, high set-up and equipment costs, and ongoing requirements for spare parts and maintenance.

VILLAGE REACH SOLUTIONS

IDENTIFYING CHALLENGES – LEADS TO OPPORTUNITIES

Each energy option presents unique challenges - VillageReach brings the expertise to develop creative solutions

Challenges	→	Solutions
Sourcing & Supply Chain Issues <ul style="list-style-type: none"> • High cost, low reliability of 3rd-party services • Lack of transportation options • Manage odd size lots • Stock outs 		<ul style="list-style-type: none"> • Diversify sourcing • Control reliability, costs through vertical integration • Purchase bulk orders • Over stock inventory
Sales, Marketing, Maintenance <ul style="list-style-type: none"> • Community behavior tracking, traditions • High capital costs (plants, technology, equipment) • Equipment service needs 		<ul style="list-style-type: none"> • Initiate peer-to-peer awareness programs • Finance with MFIs and/or monetization of carbon credits • Develop in-house and 3rd-party service capacity
Distribution, Point-of-Sale <ul style="list-style-type: none"> • Vendors unable to carry inventory • Inability to sell on consignment • Lack of available supply to retail/consumer outlets 		<ul style="list-style-type: none"> • Structure financing options with MFIs • Partner with NGOs to develop key business capabilities • Establish standard delivery routes

VILLAGE REACH’S VALUE AND APPROACH – TOOLS AND SERVICES

VillageReach utilizes a set of proven tools and services to strengthen support for health and development programs to serve under-privileged communities.

- ◆ **Market Demand Assessment:** provides a demand-side analysis by evaluating potential for organic growth potential and new market development opportunities.
- ◆ **Market Supply Assessment:** estimates the landscape of existing supply alternatives - potential competitors and partners.
- ◆ **Solutions Response Options:** defines ideal solutions alternatives, new paths to market, demand driven scenarios and determines scenarios for displacement of legacy energy options’.
- ◆ **Resource Development Requirements:** provides a framework and specific estimates of requirements to develop the business: capital investment, financial requirements, management leadership, procurement/supply estimates, strategic partners, go-to-market needs, etc.
- ◆ **Strategic Management Overview:** summarizes the business opportunity, supply options, required resources and strategic response to develop the market opportunity. The overview provides the basis for the business plan to be developed once management has been assigned.

OPPORTUNITIES TO PARTNER WITH VILLAGE REACH

VillageReach supports its partners and clients seeking to close gaps in critical infrastructure through two distinct engagement models:

- ◆ **Consulting:** providing advisory services covering market assessments and gap analysis, infrastructure development and demand creation, and business and financial planning.
- ◆ **Sub-contracting:** serving as a solutions provider and manager of businesses created to support HSS programs.

CASE STUDY - MOZAMBIQUE

In 2001, VillageReach partnered with the Mozambique Ministry of Health to improve the quality of healthcare for remote populations. In assessing the needs of the health system a critical gap was identified: a practical, transportable and efficient energy source.

Challenge	→	Solution
<p>All of the health centers in northern Mozambique, serving more than 5 million, operated beyond the electrical grid.</p> <p>The centers regularly experienced kerosene stock-outs that resulted in vaccine refrigerator down time, dangerously inadequate sterilization practices, and poor lighting conditions for evening medical procedures.</p> <p>Other applications, such as telemedicine enabled through basic information technology or communications, were distant objectives until the issues of power could be solved.</p>		<p>Partnering with the Mozambique Ministry of Health to improve the quality of health services in Northern Mozambique, VillageReach identified the need for an alternative fuel source to power essential equipment (e.g., refrigerators, lamps, sterilizers) for rural health facilities.</p> <p>VillageReach and the Foundation for Community Development (FDC) officially launched VidaGas in November 2002. The for-profit propane distribution company supplies the Mozambique Ministry of Health, households and businesses with propane.</p> <p>VidaGas has grown to become the largest propane distributor in northern Mozambique, supplying nearly 30 tons monthly.</p>



SOCIAL RETURN ON INVESTMENT

Increased Immunizations: Over 63,000 children in Cabo Delgado province, Mozambique, were fully immunized by their first birthday in 2006, a 40% increase from the program start

Decreased Stock-Outs: By 2006, 1% of health centers experienced a stock-out of some vaccines, compared to previous levels of 80%.

Environmental Protection: Decreased deforestation and flooding ... 1kg of LPG provides the equivalent energy of ~7.25kg of charcoal (African households switching to LPG reduce annual firewood consumption by an average of 120kg).

Personal Health: Improved air quality leads to decreases in diseases, especially acute respiratory illnesses, and provides health and productivity gains.

Enriched communities: Increased business opportunities through establishment of retail networks and entrepreneurial ventures. And an improved quality of life for women, benefiting from shorter walking distances for fuel collection.

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