



Lighting the World: A Business Model for Catalyzing Change

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Executive Summary

Worldwide over 1.3 billion people live without any access to electricity. In the world's 50 poorest countries, almost 80 percent of the people lack access to electricity. They rely on firewood and kerosene for their energy supply, which adversely affects their environment, health and personal safety as well as hinders their opportunities for economic progress (Legros et al, 2009). The Global BrightLight Foundation was established as a not-for-profit entity to provide globally accessible and affordable energy solutions to improve the education, community environment, economic opportunities, and resulting quality of life of those living at the Base of the Pyramid (BoP) in emerging and third world countries that currently lack access to electricity and power. While in its early stages of operation, BrightLight required an understanding of the current state of the market, a review of current market actors, an analysis of BrightLight's current capabilities, and a strategic analysis to position BrightLight to be successful amidst existing and future market dynamics.

Research Objective and Methods. The objective of this Masters Opus was to derive a comprehensive understanding of the market for provision of small-scale solar PV solutions to BoP communities, to inform strategic conversations among BrightLight's leadership with a focus on developing a distinct business model and a detailed business plan for the non-profit to achieve their mission.

A mixed methods approach for research was used to answer research questions, involving literature reviews, pilot report reviews (Rwanda and Argentinian pilot surveys on uptake of solar lanterns), and expert interviews. The project was also divided into three Phases to focus our research and deliverable set: Market Assessment, Alternative Development, and Targeted Business Plan.

The Market. Four billion low-income people comprise the BoP. These four billion have incomes less than \$3,000 in terms of local purchasing power and live in relative poverty. The BoP is characterized by significant unmet needs, dependence on informal subsistence livelihoods, and a poverty penalty. Total household income is \$5 trillion a year, which makes the BoP a potentially important global market. The BoP market is underserved and dominated by an informal and relatively inefficient economy.

The BoP market can be split into six income segments. The poorest segment earns \$500 or less annually (less than \$1.50 per day). The next poorest earns between \$500 and \$1,000 annually (less than \$3.00 per day), and so on, up to the highest segment which earns between \$2,500 and \$3,000 annually (less than \$9.00 per day).

Spending patterns in the BoP vary by country; for example Rwanda and Djibouti spend approximately 1.9% and 10.6%, respectively, of their household income on energy. Spending on energy at the BoP is approximately 40% urban and 60% rural, but rural BoP households spend on average 44% less on energy than do urban BoP households. These income and spending differences show that each region, country, and city is a unique market with different types of customer segments to serve, requiring unique marketing and distribution strategies.

As of late 2012, there are approximately 1.3 billion people without electricity access worldwide. The majority resides in Asia, but by 2030 Africa is expected to pass Asia for the largest un-electrified market.

The solar portable light (SPL) market is focused on off-grid and under-electrified markets. The SPL market is targeted predominately at consumers and small business of the BoP. The potential for off-grid lighting is substantial, and market demand is growing rapidly. In addition to global population growth, there five major drivers of demand worldwide: lagging grid growth, price trends, technology and design innovation, kerosene prices, and mobile opportunities.

SPLs align well with the energy needs of the BoP as a result of several factors, including rapidly declining manufacturing cost and customer payback period, rising price of kerosene, lantern quality improvements, and consumer-centric design.

Best Practices in the BoP. Successful organizations operating at the BoP require a different type of business sense than that of modern economies. The Michigan team conducted a literature review and spoke to current or former practitioners in the field. We learned the following lessons around operating a business or organization that serves BoP customers:

- **Take the long view** – BrightLight must be prepared for the long haul both in terms of developing relationships with local communities and developing a sustainable business model. As our contact at the International Finance Corporation stated, “Success is still early days in terms of profitability.”
- **Be prepared for a different landscape** – Margins will be low, distribution channels need to be created, and consumers must be segmented across a number of different factors. This work will require partnerships, extensive on-the-ground research, and mutual trust with local communities.
- **Keep it local** – BrightLight must create a local presence to build trust with end-consumers. These relationships, in turn, will inform product needs, business models, marketing strategies, and partnerships.
- **Create your market** – BrightLight will likely have to create a market for its product. This requires teaching end-users about the advantages of a product they know little to nothing about and for which the economics are different than their current energy purchases.
- **Embrace cooperation** – Regardless of the business model it chooses, BrightLight will have to work with other organizations, including governments, non-profits, and other businesses. Cooperation is a key ingredient to success.

- **Don't give the lights away** – The overwhelming opinion of the practitioners with whom we spoke was that giving lights away would spoil the market. BrightLight will have to create a business model to ensure that end-users have skin in the game.

We found that, in many respects, developing economies require business skills on steroids. Depending on the organizational and business model it chooses, BrightLight will need to do some or all of the following: determine the BoP segment it will serve, identify the right product for its customers, develop social networks based on trust to educate end-users about the need for lights, leverage local connections to develop “human centered” products, maintain positive local relationships to build trust, market the product(s) to end-users using a mix of traditional means (radio advertisements) and non-traditional means (puppet shows, songs, etc.), partner with NGOs to build demand, and have the patience and capital to iteratively improve the model. “Best in class” organizations have built their operating procedures and business models around these principles. While success is never guaranteed, it is imperative that BrightLight follow these best practices as it builds, pilots, refines, and scales its model. Only then will BrightLight have sustainable, lasting impact.

The Solar Lantern Value Chain. The solar lantern industry has grown significantly in terms of activity, sophistication, and number of involved organizations since 2006. Donor-based models comprised the majority of involved organizations in the past, but as the price of photovoltaic cells decreased and distribution channels were forged, the cost of operation dropped and market-based models became increasingly viable and prevalent. In turn, the quality of products has improved, in part due to the rise of BoP-centric lantern design, which the industry now considers critical to earning customer buy-in. Distribution and financing remain major market barriers, and current organizations rely on in-field NGO partners, microfinance banks, cooperatives, and village level entrepreneurs to help overcome them. As these hurdles are minimized in the next five to ten years, more private sector investment will flow into this industry, turning solar powered lanterns into a commodity and helping to de-risk and solidify distribution and financing techniques.

No single organization has achieved scale in this field, due to the highly customized nature of serving diverse BoP demographics and geographies. As a result, most successful organizations advocate replicating rather than scaling, which keeps local activities small, flexible, and customizable, but still enables transfer of key principles among satellite business groups. In other words, no single product or business model works for all BoP lantern markets.

The solar lantern value chain is comprised of eight segments of activity: minerals, design, assembly, wholesale, retail, training, financing, servicing. In general, private sector companies tend to operate on the upstream end of the value chain (minerals, design, assembly, and wholesale) while both private sector and non-profits tend to operate downstream (wholesale, retail, training, financing, servicing). Social enterprises operate across the entire value chain.

After analyzing 47 industry players, we grouped them into 5 broad categories: Gorillas, Upstream, Downstream, Financiers, and Catalysts, described briefly below. We found that

many companies were integrated across multiple categories, and many others chose a niche role within a category.

- **Gorillas** are vertically integrated social enterprises that have proprietary operations along the value chain, but often rely on partners for certain activities. By relying less on partners overall however, Gorillas remain more adaptable than other companies to changing BoP market needs, which is a competitive advantage.
- **Upstream players** are typically for-profits or social enterprises that focus on manufacturing, assembly, and design of lanterns, and have little direct engagement in upstream activities. As the price of PV drops and the industry matures, we predict upstream players will be driven to consolidate.
- **Downstream players** we found to be the most diverse, ranging from private-sector companies or social enterprises to non-profit sector NGOs. These organizations engage in varying degrees in lantern distribution, training, servicing, gathering feedback to inform better design, and occasionally financing. To succeed they rely on a dedicated in-field staff and leverage their networks of partners and their knowledge of the BoP to achieve last-mile distribution.
- **Financiers** are microfinance banks, foundations, or other investors that provide working or growth capital to fund the growth of other industry players, or provide microloans for end users to purchase solar lanterns.
- **Catalysts** are NGOs or Foundations who work at the interfaces between value chain segments to mobilize others and enable growth by removing market barriers, matching business to business, and providing supporting services and BoP market intelligence.

BrightLight's Capabilities. For BrightLight to determine its organizational model, it must first evaluate its current capabilities. This will assist the organization in understanding its strengths, assessing where its capabilities lie on the value chain, and evaluating the effort required to achieve its chosen business model. BrightLight's current capabilities include:

- Marketing
- Product testing
- Fundraising
- The ability to convene stakeholders
- Access to utility resources – funding, energy expertise, and technical & political landscape
- Direct community relationships

To better understand where BrightLight's strengths lie in this sector, we mapped the organization's current capabilities to the value chain. This analysis suggests that BrightLight's capabilities are not directly linked to any specific segment of the value chain,

such as financing or manufacturing. Rather, BrightLight's strengths are indirectly related to the value chain, providing unique challenges and possibilities for BrightLight's future. We also compared how much control BrightLight has over their capabilities, determined by the extent BrightLight relies on partners to execute key work, as well as the competitive advantage those capabilities offer. Though the true competitiveness of a capability will depend on a number of external factors, the competitive analysis suggests that BrightLight's current capabilities are generally competitive and the organization has control over its most competitive features, which include its fundraising ability and influence. However, the analysis also suggests that BrightLight is dependent on its current partnerships for many of its capabilities. One thing is clear: no matter what type of organization BrightLight hopes to become, it will require additional capabilities to the ones it currently has. We view this less as a challenge and more as an opportunity.

Business Model. Capitalizing on BrightLight's current strengths, we propose a model where GBF will serve as a connector, integrator and catalyst, facilitating delivery of region-specific, service-effective and cost-efficient means to access solar-powered energy usable on an individual, family and community scale.

GBF's strategy recognizes the systematic nature of new market development and creates a new system of value creation through providing power to the unelectrified of the world. Unlike entities that provide a single offering GBF creates a network of players that have different positions in the value network to avoid competitive conflicts and focus on providing benefits to the communities we serve. By recognizing the potential to create a value network around a new model for electrification for the poor and developing world, GBF will play a key role in fostering not only the electrification but also the economic development of those at the base of the pyramid.

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I. Introduction

Worldwide over 1.3 billion people live without any access to electricity. In the world's 50 poorest countries, almost 80 percent of the people lack access to electricity. Without a change of course, best-case scenarios show that by 2030 the total number of people without access to electricity will still be almost 900 million and 3 billion will cook on traditional fuels (Practical Action, 2012). Positive projections indicate that an estimated 400 million will gain access in the next 20 years based on current measures of electrification and the minimal funds and effort being dedicated to rural electrification. However, with population growth projections alone staying the same, the total number of un-served population will remain stable (AGECC, 2010). A worst case projection by the International Energy Agency predicts that in 2030, with no new policies to alleviate energy poverty, 1.3 billion people (some 16% of the total world population) will remain starved of electricity most of whom live in South Asia and Africa (IEA, 2009). As Figure 1 below shows, if we follow the policy status quo, the gaps between the grid-connected and the grid-unconnected is quantifiably large.

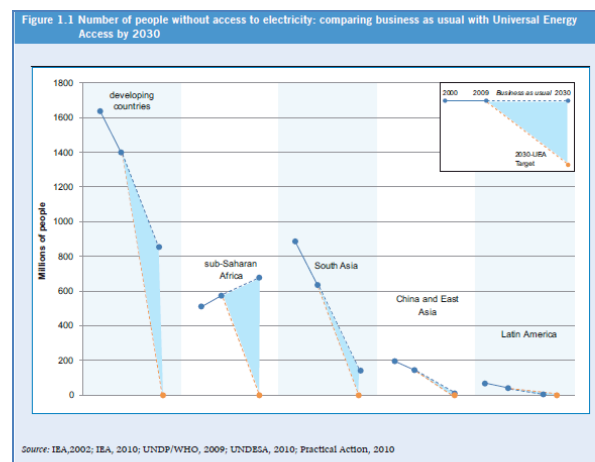


Figure 1: The "Access Gap" with current policy.

For those living without electricity, lighting and heating solutions pose significant environmental and health-related threats. They rely on firewood and kerosene for their energy supply, adversely affecting their environment, health and personal safety and hindering their opportunities for economic progress (Legros et al, 2009). Providing energy sources that are cost-efficient, effective, and safe will enable opportunities to raise their standard of living. There is a direct link between the energy to which they have access and their quality of life. Despite these issues, many rural communities are making no progress. Limited infrastructure, government indifference, and financial instability are a few common obstacles to electrification in emerging markets.

Problem Statement

Despite the vastness of the unserved population and the complexity of the problem, a compelling solution is beginning to gain traction: small solar photovoltaic (“PV”) lanterns and solar home systems are a viable better alternative to kerosene, wood and other conventional fuels for the world’s poorest and most isolated citizens (Lighting Africa, October 2010). The need for affordable solar PV systems in the developing world is continuous, and the demand for deployment is growing. Governments and energy service providers have realized that it is not economically feasible to connect and enable all communities and their people through conventional electrical grid extension. In some countries like Brazil, the government has instituted a universal electrification mandate. While there is a compelling basis and a strong desire for access to energy in these countries, energy providers are hesitant to expand their grid networks due to the high cost, while people often are not able to afford either the cost of connection or the price of delivered electricity (AGECC, 2010).

Distributed solar PV energy is an alternative to conventional grid electricity. In some forms, it has been deployed in isolated circumstances under different implementation models. The steady decline in the price of PV modules is partially responsible for this growth. Unfortunately, these efforts to provide solar PV have thus far proven unsustainable – particularly financially – because the implementation models have not been tailored to address the unique characteristics of those living at the BoP (Lighting Africa, October 2010). There is a clear need for solar PV ventures that incorporate an understanding of BoP demographics and circumstances.

The challenge in simple terms is to find a match of PV products and system capabilities that are functional and sustainable in the living conditions of BoP populations; that are delivered in a manner that respects the circumstances of the BoP population, fits with their economic capabilities, and empowers them to gain control of their own activities using increased access to power to do so, providing the means for them to improve their access to information and knowledge, increase their communication capability, and lift themselves up economically. *The Global BrightLight Foundation* seeks to meet that challenge.

The Global BrightLight Foundation was established as a not-for-profit entity to provide globally accessible and affordable energy solutions (specifically solar PV lanterns and home systems) to improve the education, community environment, economic opportunities and resulting quality of life of those living at the BoP in emerging and third world countries that currently lack access to electricity and power.

Research Objectives

The objective of this Masters Opus was to derive a comprehensive understanding of the market for provision of small-scale solar PV solutions to Base of the Pyramid communities, to inform strategic conversations among BrightLight's leadership with a focus on developing a distinct business model and a detailed business plan for the non-profit to achieve their mission.

To satisfy our objectives, the following research questions were pursued:

1. What is BrightLight's purpose? What is their mission? What are they achieving today?
2. What are the electricity / power needs of the BoP?
 - a. Is this the most important thing to the BoP?
 - b. How is development tied to access to energy?
 - c. How is access to energy different across geographies?
 - d. What is the value of electricity (and the solar lantern technology) to the user and how can we recover some of that value?
 - e. How could RE technologies serve as a stepping stone to finding solutions to the challenge of rural electrification (e.g., distributed energy generation)?
 - f. How are RE technologies currently distributed to BoP populations? How can RE technology be best distributed to BoP customers?
3. What does the solar lantern industry look like today? (Key players, value chain, products, etc.)
4. What are the opportunities for either social enterprise or philanthropy-based businesses to provide value to the BOP through enabling technologies or services?
5. What is the status of BrightLight's current operations today? What are its core competencies or value proposition to the BoP and development of isolated communities (e.g., funding, distribution of goods)?
6. How are the current pilots helping BrightLight find meaning, offer value and improve their business and products?
7. What should BrightLight's business model look like?
 - a. How can BrightLight capture value in the value chain, ie what is their niche? Manufacturing / assembly? Distribution / provision? End use / training? Financing?
 - b. How could BL's unique competencies be built up to provide value to target communities and users?
 - c. Should BrightLight be a social enterprise or philanthropy-based organization?
 - d. What financial, operational and team structure would foster success against BrightLight's goals?
8. What are some potential growth opportunities for BrightLight?

Research Methods

A mixed methods approach for research was used to answer the outlined research questions, involving literature reviews, pilot report reviews (Rwanda and Argentinian pilot surveys on uptake of solar lanterns), and expert interviews. The project was also divided into three Phases to focus our research and deliverable set: Market Assessment, Alternative Development, and Targeted Business Plan. The following provides detail on each phase, the nature of research conducted, and the methodology used in each case.

Phase 1: Market Assessment. Research began with a market assessment that included a *literature review* of Base of Pyramid scholarly publications including those written by Stuart Hart, C.K. Prahalad, and Ted London. Additionally, interviews with Professors Ted London and Michael Gordon were utilized for specific insight into energy challenges and businesses at the BoP. *Expert interviews* and *secondary research* were also conducted for two reasons: 1) to gauge issue areas and best practice in distribution of solar lamps with organizations currently serving BoP communities with energy solutions; and, 2) to construct a comprehensive understanding of the full value chain. Through this research the team was able to understand the growth, strategic needs, market attractiveness and opportunities as well as the best practices in distributing solar technologies to the BoP. Organizations studied or interviewed included:

- WE CARE Solar
- Barefoot Power
- D.Light Design
- ECCA (FutureNow Pvt. Ltd)
- Greenlight Planet
- Light Up The World Foundation
- Lighting Africa (an IFC initiative)
- Practical Action
- BoGo Solar Lights (brand name for SunNight Solar)
- Cosmos Ignite Innovations
- IndiGo Solar (Brand name of Eight19)
- Kamworks
- Nokero
- Shidhulai
- Sunlabob Renewable Energies
- Thrive
- Sollatek
- Nuru
- LifeLine Energy
- Solar and LED Energy Access Program (SLED)
- Solar Electric Light Fund (SELF)
- Solar for All
- Solar for All Support Facility
- Solar Sister
- SolarAid
- Onergy
- Aryavart Gramin Bank
- Bamboo Global Energy Fund (Solar for All - Financing)
- Bennu-Solar
- Canopus foundation
- Citi Foundation
- Energy for Everyone
- Fifty Lanterns International
- Shell Foundation
- SELCO
- Solio (the brand name of company Better Energy Systems)
- The Portable Light Project

- ToughStuff International
- Arc Finance
- Barefoot College
- Beyond Sola
- The Sun Shines for All (IDEAAS)
- Vanrepa/GREEN Power
- Energy Aid
- One Million Lights Foundation

This research of the solar lamp and cell phone charger industry allowed for an understanding of the different roles of in the industry including manufacturers, distributors, facilitators, users, and current market partners.

In order to understand how BrightLight would offer value in enabling the provision of solar lanterns to the BoP (the BoP value chain), BrightLight's activities to date and competencies were analyzed and characterized through evaluation of its solar lantern distribution pilots and feedback surveys conducted in Rwanda and Argentina, as well as surveys of the current BrightLight leadership in regards to the organization's current and to be developed competencies.

Research Limitations

The main limitation of this research phase was the lack of primary research in the communities and regions affected. It is one thing to use desktop research to hypothesize effective business models, but to develop a business model that is sustainable, culturally sensitive, and strategic requires working in a community to understand its culture, systems, and values. Attempts were made to fund supplemental on-the-ground research of the BoP. However, funding was not available for the team.

Phase 2: Alternative Development. During this phase, the team furthered its research by focusing on the role and capabilities of BrightLight, given the BOP landscape defined in Phase 1.

The team further analyzed the value chain by identifying activities that would allow BrightLight to drive success and create a strategic advantage through the network of existing suppliers and distributors in the market. This research was then coupled with a strategic planning session with the organization's board focused on what kind of organization they sought to be (market or philanthropy minded, and, focused on a niche service / product or a integrated set of products / service). Through research on alternative organizational structures and foci, several alternatives for BrightLight's operating model were constructed, including BrightLight's would-be role in the value chain that presented the best opportunities for impact and value-add to the BOP. These findings and alternatives were presented to the BrightLight management team on April 23rd during an all-day workshop in North Carolina, discussing the trade-offs of each model, and ultimately arriving at a decision as to their strategic direction as an organization that directly informed business plan and model development. The result of this workshop was a description of BrightLight's desired business model, a definition of the role BrightLight would play in the value chain, the guiding principles of the organization,

as well as a clear understanding of BrightLight’s current assets and what assets they hope to capitalize / build on in order to achieve their desired business model and be a valued player in the market. A solid understanding of the desired business model and Brightlight’s competencies allowed us to proceed on to further research centered on the organization’s business plan.

The primary challenge of this phase was to understand the BrightLight leadership’s own vision for growth, success and role in the value chain, and work their vision into our recommendations as their ideas relate to our research findings. The workshop presentation utilized can be found in Appendix A.

The deliverables from Phase 1 and Phase 2 are summarized in the section titled “Findings” starting on Page 7 below.

Phase 3: Targeted Business Plan. During Phase 3, the team drew upon research on the market (from Phase 1) and the selection of BrightLight’s preferred operating model (from Phase 2), as well as information from the existing (and any potential new) pilots to develop a sustainable business model for the organization through a written Business Plan. Components of the Business Plan included:

- I. Introduction, the Challenge and the Opportunity
- II. Mission Statement
- III. Strategy, Goals & Objectives
- IV. Guiding Principles of the Organization
- V. Market Analysis
- VI. Target Markets
- VII. Product
- VIII. Partners
- IX. Distribution
- X. Finances
- XI. Growth Options:

The primary challenge of this phase was to deliver a business plan that would be flexible to potential changes in the market and priorities of the organization, including its engagement by the Global Sustainable Electrification Partnership to do large-scale distribution of lanterns.

The deliverables from Phase 3 are summarized in the section titled “Next Steps: A Business Plan to Catalyze Change” starting on page 44.

II. Findings

Base of the Pyramid and Market Overview

What is the Base of the Pyramid?

Four billion low-income people comprise the base of the economic pyramid (BoP). These four billion have incomes less than \$3,000 in terms of local purchasing power and live in relative poverty (World Resource Institute, 2007). For example, Ghana's average income in U.S. dollars is less than \$1.89. Yet combined the base of the pyramid represents significant purchasing power: a \$5 trillion global consumer market. The wealthier mid-market population segment of the BoP with incomes between \$3,000 and \$20,000 represent 1.4 billion people and is relatively well served (World Resource Institute, 2007).

The BoP market is underserved, often rural, and dominated by an informal and relatively inefficient economy (World Resource Institute, 2007). The BoP makes up a large share of the world's population and nearly all of the BoP resides in Africa, Asia, Eastern Europe, Latin America, and the Caribbean (World Resource Institute, 2007).

Although the BoP is concentrated in these areas, each region, country, and city is composed of very different incomes, expenditures, and access to services. Additionally, rural areas dominate most of the BoP in Africa and Asia, but urban areas dominate most of Eastern Europe and Latin America (World Resource Institute, 2007).

The BoP is composed of very different incomes, expenditures, and access to services various regions, countries, and cities (World Resource Institute, 2007).

Living at the BoP

The four billion in the BoP share similar characteristics:

- **Significant unmet needs.** Most people in the BoP do not have bank accounts or own a cell phone and many live in informal settlements with no formal addresses. Many lack access to electricity, basic health care, water, and sanitation services (World Resource Institute, 2007).
- **Dependence on informal or subsistence livelihoods.** Most people in the BoP lack market access to sell their labor, handmade products, or crops and must sell to local employers or to middlemen who exploit them (World Resource Institute, 2007).
- **Poverty Penalty.** Many in the BoP pay higher prices and receive lower quality for basic goods and services, either in cash or work to obtain them (World Resource Institute, 2007).

BoP Marketplace

The global market at the base of the economic pyramid is already vast and will grow further in the decades to come. The global population is increasing at a high rate and is projected to reach more than 9 billion in 2050 (United Nations: Population Division, 2011). Virtually all of this growth will take place in emerging and developing countries outside nations in the Organization for Economic Co-Operation and Development (United Nations:

Population Division, 2011). Additionally, the global urban population will double as cities experience a disproportionate share of this population increase (World Business Council for Sustainable Development, 2010).

Until recently, there has been an information gap about serving markets at the BoP. Today, we have much more information about the BoP, the needs of the BoP, and market penetration strategies that include more market based approaches. There are distinct differences between a market based approach to poverty reduction and more traditional approaches. Traditional approaches often focus on the very poor and require charity or public assistance. A market approach, in contrast, recognizes that being poor does not eliminate commerce and market processes as almost all poor households trade cash or labor to meet their basic needs. Market based approaches focus on people as consumers and producers and on solutions that make markets more efficient, competitive, and inclusive so BoP can benefit from them.

Traditional approaches have tended to focus on unmet needs for health care, clean water, or basic necessities by setting targets for meeting those needs through public investments or subsidies. The results have not been strikingly successful even with increased investment and activity. Market based approaches seek opportunity at the entire BoP, not just the very poor. They pursue the segments that have a willingness to pay. Solutions are manifested in new products and new business models that can provide goods and services that the BoP can use and afford, not simply serving the BoP like any other customer.

BoP Markets

Total household income at the BoP is \$5 trillion a year, which establishes the BoP as a potentially important global market. This market has large variations across regions, countries, and sectors in size and other characteristics.

<p>Asia</p> <ul style="list-style-type: none"> - \$3.47 trillion household income - 2.86 billion people - 83% of the region’s population - 42% of the purchasing power 	<p>Eastern Europe</p> <ul style="list-style-type: none"> - \$458 billion household income - 254 million people - 64% of the region’s population - 36% of the purchasing power
<p>Latin America</p> <ul style="list-style-type: none"> - \$509 billion household income - 306 million people - 70% of the region’s population - 28% of the purchasing power 	<p>Africa</p> <ul style="list-style-type: none"> - \$429 billion household income - 486 million people - 95% of the region’s population - 71% of the purchasing power

Sector markets also range in size, as can be seen in the following (annual spend in the BoP):

- Water – \$20 billion
- Information and Communication Technology – \$51 billion
- Health – \$158 billion
- Transportation – \$179 billion
- Housing – \$332 billion

- Energy – \$433 billion
- Food – \$2,895 billion

Market Composition

Market segments of wealth from low- to middle- income differ significantly, in particular regarding access to services such as piped water and electricity. There are about 24% of BoP households that lack access to electricity, while only 1% of mid-market households do (World Resource Institute, 2007). These same differences can be seen with the type of region as well as in rural versus urban settings.

The World Resource Institute has split the market into six income segments (see Figure 2 on the next page). The top segment is households who earn between \$2,500 and \$3,000 annually, or less than \$9 a day. The next segment is between \$2,000 and above \$2,500, or less than \$7.50 a day. And so on.



Figure 2 BoP Market by Income Segment (Source: World resource Institute, "The Next 4 Billion")

The wealthier mid-market population segment consists of 1.4 billion people with income between \$3,000 and \$20,000 and represents \$12.5 trillion globally. This market is largely urban, relatively well served, and extremely competitive. However, BoP markets are often rural, poorly served, dominated by the informal economy, and as a result, relatively inefficient and uncompetitive.

Spending patterns

Population and income structures are not the only reliable guide to market composition. The BoP has also been analyzed through spending patterns by country, sector, and income level. This data is also available from the World Bank initiative. As demonstrated in Figure 3, spending patterns are unique to the individual country. The BoP in Rwanda and Djibouti spend about 1.9% and 10.6% respectively of their household income on energy.

Sector shares of household expenditure (%)	Rwanda		Djibouti	
	National	BOP	National	BOP
Food	48.4	58.3	56.0	55.6
Housing	13.9	13.9	10.0	10.8
Water	3.8	0.7	4.3	4.2
Energy	2.1	1.9	10.5	10.6
Household goods	8.4	8.8	6.8	6.6
Health	7.1	3.1	2.3	2.1
Transportation	4.4	2.3	4.8	4.9
ICT	0.5	0.2	n.a	n.a
Education	0.5	0.4	0.3	0.3
Other	10.9	10.4	5.1	4.9
Total	100.0	100.0	100.0	100.0

Source: World Resource Institute, "The Next Four Billion"

Figure 3 Share of Household Expenditure (Source: World Resource Institute, "The Next 4 Billion")

Energy Market

The United Nations has deemed 2012 to be the ‘Year of Sustainable Energy for All.’ This push by the UN is echoed in the current landscape of organizations attempting to fulfill the BoP’s energy needs (Practical Action, 2012). The BoP already spends a tremendous amount of their income on energy. According to the International Finance Organization (IFC) and World Resource Institute (WRI), the BoP spends an estimated \$433 billion on energy per year. The largest regional market is Asia (including the Middle East) with annual spending estimated at \$351 billion among 2.9 billion people (Gradl, June 2011).

Where is the market? Rural BoP households spend on average 44% less on energy than do urban BoP households

After food and housing, energy is the biggest expense for the BoP. On average the BoP spends 9% of household expenditure on energy. Households with an annual income up to \$500 spend an average of \$148 per year on energy, equivalent to \$0.40 a day. Those earning between \$1,000 and \$1,500 per year spend nearly \$1 a day. In some countries, the BoP comprises the largest share of the energy market. It accounts for 90% of spending on non-commercial energy in countries such as Indonesia and Nigeria, and more than 50% in countries such as Brazil, India and Uganda (World Resource Institute, 2007).

Spending on energy at the BoP is approximately 40% urban and 60% rural, but rural BoP households spend on average 44% less on energy than do urban BoP households.

As mentioned earlier, a common phenomenon in low-income markets is the “poverty penalty”, referring to the fact that poor people have to spend more than wealthier ones on the same product or service. A study performed by MicroEnergy International showed that 1 kWh costs \$2.30 in rural Bangladesh, compared to about \$0.30 in Western Europe (Gradl, June 2011). The cost of lighting can also include premiums for the poor. In a report from Guatemala in 2000, 1 kWh of light cost \$0.08 from the grid, \$5.87 from kerosene and \$13.00 from candles (Practical Action, 2012). There is an opportunity for people in these contexts to pay affordable sums for clean, reliable energy services.

BoP incomes are often irregular; low-income consumers tend to value payment flexibility (Gradl, June 2011).

Most energy-related expenditure is focused on cooking, heating, and lighting. Low-income households generally use paraffin candles and kerosene lamps for light. Spending is very flexible for all of these fuels, as products and services may be purchased in small amounts. As BoP incomes are not only low, but typically also irregular, low-income consumers tend to value this flexibility (Gradl, June 2011).

The BoP has access to a variety of technologies for energy. For example, in 2009 grid connection rates across Africa stood at 35% with more than 110 million homes covering 580 people (see Figure 4).

Region	% On-Grid	HH millions on grid	HH millions off-grid
Central Africa	18%	4	19
East Africa	15%	9	50
North Africa	76%	18	6
Southern Africa	70%	7	3
West Africa	39%	22	34
Africa Total	35%	60	111

Source: Dalberg analysis based on country-level grid penetration model for 2009

Figure 4 Proportion of African population on and off-grid

Africa’s on-grid connection of 35% may be inflated due to labeling households near the grid as grid-connected. Grid access cannot stand on its own; rather electricity demand, supply shortages, and power outages should be reviewed to achieve true electricity gaps as represented in Figure 5.

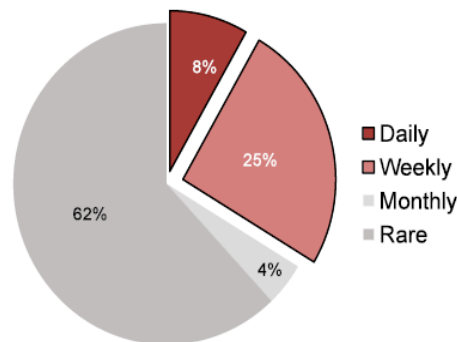


Figure 5 Blackout Occurrence among Africa Grid Connected Households (Source: Lighting Africa)

Beyond grid accessibility, much of the BoP uses off-grid appliances and accessible fuels for electricity. The primary light source is kerosene and candles. These light sources also depend on the country. For example, kerosene is the primary light source for 83% of households in Kenya; however candles are the primary light source of light for 79% in Zambia, as shown in Figure 6.

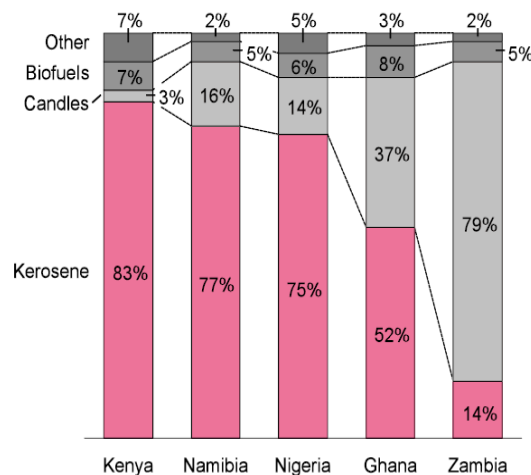


Figure 6 Primary light for off-grid households across African countries (Source: Lighting Africa)

Asia has the highest un-electrified market today, however with Africa’s population growth and Asia’s increasing grid connectedness, Africa will surpass Asia as the highest un-electrified market by 2030, shown in Figure 7.



Figure 7 Proportion of lack of electrification in 2009 and 2030 based on current policies (Source: International Energy Agency)

The measurement of people without access is useful to depict the supply-side perspective; however it does not reflect the demand side. Development is defined in part as the ability to choose, which is reflected by UNDP’s statement that, “Development is about expanding choices people have to lead lives that they value” (The Earth Institute, Columbia University, 2010). The notion of affordability is not captured by measuring access to electricity, but proves one of the most important contributors to development. An increase in access cannot always be interpreted as development progress (The Earth Institute, Columbia University, 2010). For example, a higher share of household spending on energy is considered to detract from development.

Within these four regions (Middle East, Latin America, Asia, and Africa), rural and slum populations have the lowest electricity access (Gradl, June 2011) as shown in Figure 8.

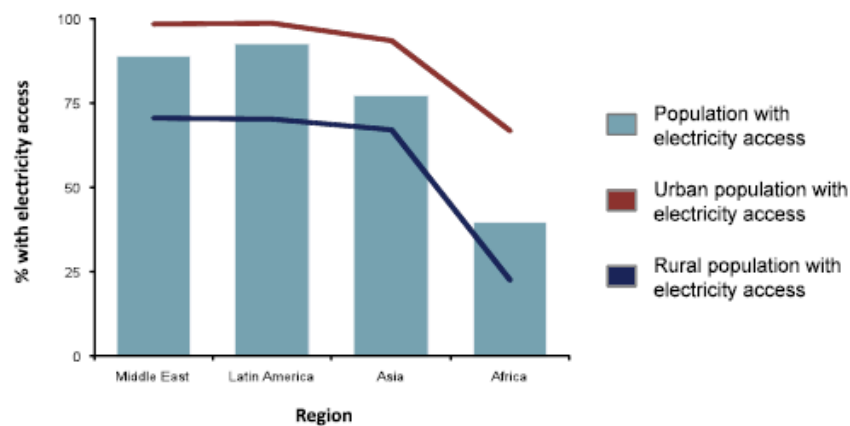


Figure 8 Electrification Rates by Geography (Source: Lighting Africa)

Solar portable light market

The solar portable light market (SPL) is fairly new to the BoP. Initially the BoP lighting market was characterized by large solar PV systems, such as solar home systems (SHS). Today, SPL technologies are vastly improved and lower in price. The market has also seen changes in the types of organizations and business models. Donor based models initially comprised the majority of models, and while they remain significant and growing percentage of industry players, the market has entered a growth phase led by SPL entrepreneurs. Donor models are still reaching more customers than market based organizations, however the impact is lower due to customers need to have paid into owning or renting the SPL to use it effectively. Yet overall scale remains small, price is still a barrier, and the majority of customers still need to be reached.

The SPL market is focused on off-grid and under electrified markets. As mentioned earlier, these markets are unique with varying income levels and electricity access. The SPL market is predominately targeted at consumers and small business of the BoP. The potential for off-grid lighting is not only large, but is growing rapidly. Beyond overall population growth, the five major drivers of demand globally are (Lighting Africa, October 2010):

- **Lagging grid growth:** Grid growth as a driver for SPL demand varies by region, with rapid grid growth likely in select Asian and Latin American geographies and very slow grid growth in many African nations. Grid penetration typically needs to grow by over 2% a year to counteract the effect of population growth. This means that even substantial investments to the grid will leave many large nations with sizeable and growing off-grid populations for future decades (Lighting Africa, October 2010).
- **Price trends:** Rapid technological innovation in basic SPL technologies and increased scale of commercialization lighting is driving a substantial decrease in the manufactured cost and price of SPL. Affordability and up front cost arguably are the main obstacle to market adoption. Falling manufacturing costs and corresponding declines in the retail product price will be a critical driver of demand going forward (Lighting Africa, October 2010).
- **Technology and design innovation:** Beyond improvements in price, the top of the SPL market is also undergoing a revolution in product design and quality. Most manufacturers have not yet achieved the quality and reliability standards of mass produced consumer electronics. The market however, is starting to see a number of products that combine product sturdiness, long battery life, and most importantly, value-added features and product designs that address the particular needs of BoP off-grid and under-electrified customers. Once the components fall in price and entrepreneurs invest more into studying local conditions and end users innovation will accelerate (Lighting Africa, October 2010).
- **Kerosene prices:** Kerosene, the main traditional alternative to off-grid renewable lighting, has long been an expensive commodity for the poor and is expected to

continue increasing in price. The prices are forecasted to increase on average 4% annually through 2015. This, combined with increasing pressure on kerosene subsidies in Asia and Africa, will drive consumer demand for cheaper alternatives (Lighting Africa, October 2010).

- **Mobile opportunity:** As of 2010, nearly 500 million people worldwide (i.e., a third of the 1.3 billion off-grid population) had a mobile phone, but no easy or cheap access to a means of charging their phones. A number of potential charging solutions are on the market, but if lighting manufacturers take advantage of this trend (e.g., partnerships with phone companies, mainstreaming of mobile charging functionality), the mobile charging opportunity could become a major driver for SPLs rather than the light (Lighting Africa, October 2010).

These factors are specifically posed to align well with the energy needs of the BoP. However, despite the clear opportunity to serve the BoP's needs, the solar lantern market is highly segmented and complex. Although more defined today than ever before, the BoP has key differences from traditional western markets. There are some insights that organizations serving the BoP must be aware of to reach their goals.

Best Practices at the BoP

“The real strategic challenge for managers is to visualize an active market where only abject poverty exists today. It takes tremendous imagination and creativity to engineer a market infrastructure out of a completely unorganized sector.”

~ C.K. Prahalad & Stu Hart, “**The Fortune at the Bottom of the Pyramid**”

If done correctly, serving a market of 1.3 billion customers offers enormous potential both for profit and social impact. Serving these markets also represents challenges that can hobble a venture from the beginning. The key insight is that serving markets in developing countries is fundamentally different than serving markets in developed countries. A review of the relevant literature and conversations with practitioners suggests the following best practices and principles for BrightLight to adopt as it designs, pilots, and scales its operating model.

Take the Long View. Patience is key to developing the right business model and offers a chance to conduct R&D within target communities (Prahalad & Hart, First Quarter, 2002). Patient innovation is iterative and requires long lead times for practitioners to test and refine the business model. This effort also requires making and maintaining partnerships with local NGOs that serve the target community (London, A Base-of-the-Pyramid Perspective on Poverty Alleviation, July 2007). During the test

“Success is Still Early Days”

During our interview with Russell Sturm at the International Finance Corporation, an arm of the World Bank, he said there were “five companies that are leading and are well capitalized” including Barefoot Power, GreenLight Planet, and d.light. These companies have existed anywhere from four to seven years and yet, according to Russell, “**success is still early days for everyone in terms of profitability.**”

phase, successful ventures make necessary plans to ensure that any negative impacts from the potential failure of its pilots are carefully considered and properly mitigated (London & Hart, Next Generation Business Strategies for the Base of the Pyramid: New Approaches for Building Mutual Value, November 22, 2010). BrightLight has shown their commitment to patient innovation by running pilots in Rwanda and Argentina. BrightLight should continue to work with pilot partners and local communities to iteratively improve their model before scaling and, at all costs, ensure that any negative effects from a potential pilot failure are ameliorated. Hosting pilots in multiple places can blur dependent and independent variables because of the vast differences between two countries. This in turn makes true understanding of which factors affect which outcomes difficult to discern, which limits the ability of pilots to determine, among other things, what the BoP needs from BrightLight, what BrightLight's value is to the BoP, and how the organization can improve.

Be Prepared for a Different Landscape. Every aspect of BoP markets is different than would be found in a developed economy. Some key BoP market characteristics include:

- Consumers in BoP markets are not all the same. A deep understanding of consumers in each location is required to correctly segment and serve the market. While not intuitive, those making \$4 a day live vastly different lives than those making \$1 a day (London, A Base-of-the-Pyramid Perspective on Poverty Alleviation, July 2007).
- Distribution channels will likely not exist and need to be designed and implemented with the goal of creating value for partnering organizations (London, A Base-of-the-Pyramid Perspective on Poverty Alleviation, July 2007). However, partnering is the inexpensive method to reach the BoP, however different partnerships have different needs that BrightLight has to take into account. BrightLight must align the commercial value of its product and business model with the social impact sought by NGOs and other on-the-ground partners or the revenue impact corporate players with distribution channels require.
- Margins will be low. The goal is not to make cheap products, but rather to redefine cost structures to meet the needs of low-income consumers while providing enough profit at scale to ensure a sustainable business model (Prahalad & Hart, First Quarter, 2002).

Case Study: ESSMART

The sophistication of distribution channels in these markets runs the gamut: urban channels tend to be well defined, while rural channels likely do not exist. ESSMART is a start-up social venture focused on solely on creating distribution channels. They act as a "technology aggregator" by selling multiple energy products to retail stores in peri-urban stores. These stores provide access to consumers in urban whose income allows the business to earn revenue quickly, as well as customers from rural villages who visit peri-urban stores to buy goods.

- Using different information sources to size markets than those used in mature markets (London & Hart, Next Generation Business Strategies for the Base of the Pyramid: New Approaches for Building Mutual Value, November 22, 2010). Critical to this process is developing deep and lasting relationship with individuals, organizations, and governments in the target region (London, A Base-of-the-Pyramid Perspective on Poverty Alleviation, July 2007).

Keep it Local. To achieve lasting impact and build a sustainable enterprise, BrightLight must gain the trust of its customers by becoming indigenous to the locations in which it operates. Specifically, BrightLight must have staff live in its target countries or visit its communities often to demonstrate the organization’s commitment and develop local knowledge. The biggest challenge to this goal is not intellectual property, technology, or the rule of law, but a business model that implicitly and explicitly makes trust with local customers the cornerstone of its model (London & Hart, Developing Native Capability, Summer 2005). To achieve

“Investment capacity is not as important as the ability to collaborate, to build a new ecosystem, and to develop fundamentally different business models.”

Case Study: KickStart Water Pump

During our interview with Professor Michael Gordon, we learned about the efforts required to create a market for the KickStart Water Pump.

The water pump sold at prices that equaled many months worth of salary, but offered end-users the chance to start businesses. The challenge was that promotional channels that work in developed nations (TV, radio, billboards) don’t work in developing markets. To educate consumers about the pump’s benefits, KickStart had to take the time to understand what community attributes they could use to spread the message about the pump’s importance and value. Among their efforts, they created a puppet show and wrote a “rap” in Swahili extolling the virtues of the pump. Ultimately, they were successful because they were patient, had a local presence, and adapted their strategy to the situation (and not the other way around).

this, BrightLight must create business models that respect the cultures and lifestyles of local people (Prahalad & Hart, First Quarter, 2002). Rather than simply replicating western systems or trying to change “what is wrong” with a community, BrightLight must use “what is right” about a community to sell its product. A useful analogy is to imagine that the effort is similar to bottling new wine (i.e., a new product) in old bottles (i.e., existing channels) (London, A Base-of-the-Pyramid Perspective on Poverty Alleviation, July 2007). This requires a tremendous amount of customization for each individual market, which hampers attempts to reach scale in larger and larger markets. Rather than scale, BrightLight must seek to develop a model that is replicable in other environments. In the same vein, many BoP experts stressed the importance of “working hard to stay small” as well as local, in order to hone operations in one country before entering another.

Create Your Market. There is a large market opportunity; however a fortune is not ready to be found. In many areas, BrightLight will be compelled to create, or rather co-create, the market with local non-governmental agencies

(NGOs), governments, and consumers themselves. Unlike markets in the developed world, market entry does not start with sizing up the market. Rather, BrightLight should first measure the extent to which the market already exists and what effort is required to either create a new market or bolster an existing one (London & Hart, Next Generation Business Strategies for the Base of the Pyramid: New Approaches for Building Mutual Value, November 22, 2010). A major part of this work requires educating consumers about the social impacts of the product. An old adage applies, “Give a person a fish and you feed him for a day; teach that person to fish and you feed him for a lifetime.” In our context, it is not enough to give away a light. BrightLight must teach end-users the importance of light in their lives – education for their children, power for their cell phones, income for their livelihood, and a cleaner fuel to light their homes. This requires investing in a strong local presence, building a brand of trust (not just a trusted brand), and showing communities that BrightLight will not abandon them.

Enable Co-Creation and Bottom-Up

Strategies. A critical need to understand these markets is to engage with consumers, seek their advice, and incorporate that learning into the venture’s design (London & Hart, Next Generation Business Strategies for the Base of the Pyramid: New Approaches for Building Mutual Value, November 22, 2010). Local co-creation and bottom-up strategies are keys to success in these markets (London, A Base-of-the-Pyramid Perspective on Poverty Alleviation, July 2007). A top-down approach will not work. Additionally, ventures must take a longer-term view of their enterprise. This manifests itself in the patience required to experiment with business models, create the market, build deep, long-term relationships with communities, consumers, and NGOs, and maintain those relationship (London & Hart, Next Generation Business Strategies for the Base of the Pyramid: New Approaches for Building Mutual Value, November 22, 2010). For any organization on the ground, this also means hiring dedicated, employees that work in-field, whether they are from the BoP or the developed world, and provide intense loyalty and passion for the company’s mission. As one local BoP expert described it, these are people an organization can trust to “relentlessly” find solutions on the ground to the myriad of problems that arise in the developing world. Because of the agency problem, these employees must work for the organization, and cannot be contractors. Ultimately, succeeding in the BoP requires more dedication than expertise, which in turn requires loyal, in-field employees.

Case Study: Phillips LEDs

Phillips thought it had an opportunity to sell its LED reading light (the one that clips onto books for easier reading at night) to consumers in developing countries. They believed their knowledge of marketing, distribution, and business could be applied to developing markets. Instead the business experiment flopped. According to Russell at IFC, “They thought they knew it all, but they didn’t know anything.” Phillips failed to fully understand their consumers, work with them to create a market, or build-on-the-ground relationships.

Embrace Cooperation & Collaboration. Developing markets require collaboration at almost every link along the value chain (London & Hart, Next Generation Business Strategies for the Base of the Pyramid: New Approaches for Building Mutual Value, November 22, 2010). Building mutually beneficial relationships with other for-profit, non-profit, and governmental organizations is imperative (London, A Base-of-the-Pyramid Perspective on Poverty Alleviation, July 2007). In the case of NGOs, BrightLight must ensure a high enough social impact to maintain the continued participation of their NGO partners (London & Hart, Next Generation Business Strategies for the Base of the Pyramid: New Approaches for Building Mutual Value, November 22, 2010). In return, these partnerships can help protect BrightLight from challenges posed by entrenched powers (i.e., governments) in a given market (Prahalad & Hart, First Quarter, 2002).

Don't Give the Light Away! Nearly every single person we have interviewed, from start-up ventures (ESSMART) to mid-sized players (Barefoot) to large governmental organizations (IFC), has agreed on one central idea: don't give the lights away. Organizations with that model were derided, sneered at, and lamented. Multiple practitioners referred to it as "spoiling" the market. One called it a "market killer." Barefoot's Joyce DeMucci said that even aid agencies found that selling lights in refugee camps for next to nothing was better than giving them away. Part of the reason these practitioners reacted so strongly is because of the hard work they put in to overcome what Indego Africa called the "beneficiary mindset," which has been fostered over the years by development NGOs and agencies giving away aid rather than building local skills. To overcome the upfront cost barrier, some organizations use an increasingly prevalent business model in which they provide the lights at no initial cost to consumer, but require payback through kerosene cost savings over time, and with interest.

Determine the Extent of Your Social Mission. For social enterprises, there is at times a tension between commercial success and fulfillment of a social mission. Organizations must explore which end of the commercial-to-social spectrum they wish to fall or risk making key decisions reactively rather than strategically. For example, if reaching the largest number of lantern users is the primary mission, then instituting sales targets would motivate sales staff to reach the low hanging fruit customers. However, this strategy would not motivate sales to reach those in the greatest need, who are typically rural and hard to reach. The mission dictates the business model and the mission must be determined first. While non-profits may embody the deepest social mission, they often struggle with the problem of serving two masters – funders and customers – whereas businesses serve one – customers – who by nature also provide the funding. As a result, non-profits may excel at fundraising, and therefore may last in perpetuity without providing any value to customers. These customers, in turn, have no mechanism to influence the non-profits direction, as they can with

"If one mixes the social objective with the commercial objective, it is most likely that the commercial objective will dominate. This is because it usually easy to fulfill the commercial objective."

~Dr. H. Harish Hande
Founder & CEO of SELCO

their dollar in the for-profit sector. In sum, the market versus donor-based model is a discussion of trade-offs with no single correct answer for the BoP, but is critical to achieve operational alignment and strategic direction.

We found that, in many respects, developing economies require business skills on steroids. Depending on the organizational and business model it chooses, BrightLight will need to do some or all of the following: determine the BoP segment it will serve, identify the right product for its customers; develop social networks based on trust to educate end-users about the need for lights; leverage local connections to develop “human centered” products; maintain positive local relationships to build trust; market the product(s) to end-users using a mix of traditional means (radio advertisements) and non-traditional means (puppet shows, songs, etc.); partner with NGOs to build demand; and have the patience and capital to iteratively improve the model. “Best in class” organizations have built their operating procedures and business models around these principles. While success is never guaranteed, it is imperative that BrightLight follow these best practices as it builds, pilots, refines, and scales its model. Only then will BrightLight have sustainable, lasting impact.

Solar Lantern Value Chain

Industry Timeline

Since 2006, the solar lantern industry experienced notable growth, both from sheer number of players and sophistication of business models and distribution. This history can be represented in three phases:

2006 – 2009: Initial growth phase

- Support for off-grid energy systems is high; the industry focuses on solar photovoltaic (PV) systems
- Low-quality, expensive solar powered lanterns (SPLs) emerge on the scene
- Donor-based models dominate

2009 – 2012: Growth phase

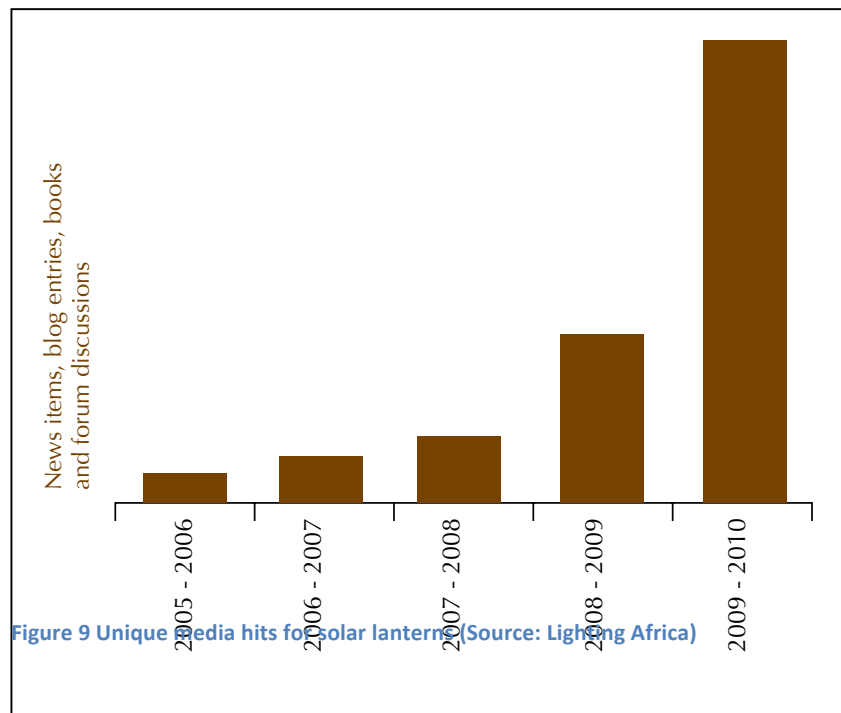
- Industry players begin to incorporate consumer-centric lantern design that meets the specific needs of base of the pyramid (BoP) end users
- Social enterprises and market-based models, business models that empower BoP entrepreneurs, grow rapidly
- Donor-based models continue to grow, but not as quickly as market-based models

2012 – 2015: Exponential growth phase

- To reach more end-users, the industry seeks to overcome key market barriers, including sustainable methods for scaling distribution and end-user financing that minimizes the upfront cost barrier for BoP consumers
- In the near future, manufacturers will consolidate to continue pushing the price of PV-based lanterns down, and private sector investment will grow as industry business models become proven and self-sustaining (Lighting Africa, October 2010)

Industry Trends

- In the past few years, the industry's growth has enabled several positive trends that a positive feedback loop, encouraging additional industry growth. These trends include:
 - Growing media awareness around solar powered lanterns (see Figure 9 below);
 - Improving lantern product quality and technology sophistication;
 - Increasing cost of kerosene, enabling greater fuel switching to alternative fuels;
 - Growth in both donor-based and market-based models, indicating an overall growth in the industry from all sectors;
 - Greater industry consolidation, as well as networking and partner leveraging; and,
 - Decreasing lantern price and payback, helping to minimize the upfront cost barrier of lanterns (Lighting Africa, October 2010).



Keys to Industry Success

The team gathered industry knowledge from publications, company analysis, and individual interviews to determine the key factors that enable success in this field. Six factors emerged again and again as critical to becoming a self-sustaining and impactful enterprise:

- **Design based on the needs of the BoP customer.** There is no single product that meets the needs of every end user, since the BoP is a vast and diverse market comprised of multiple sub-markets, including back-up power markets, small

business markets, and rural home markets. This diversity translates into lantern features (e.g. flexibility v. durability, soft ambient v. bright directional light), so it is critical to manufacture or source a product that meets the particular market's needs. Additionally, each BoP customer will have unique financing needs that may require added customization.

- **Financing to overcome credit bottlenecks.** The high upfront cost of lanterns to most BoP customers has fueled great innovation around microfinance, micro-franchise, and micro-consignment business models. Financing innovation will continue to be critical, and we believe successful companies will find ways to bundle financing options with the product itself. Additionally, working capital and long-term growth capital for companies in this industry is limited. Social investment funds and foundations will continue to play an important role in funding cash-strapped companies as long as most companies remain financially unsustainable in the short term.
- **Distribution to those with the greatest need (and hardest to reach).** Companies with replicable distribution models will benefit from greater market share and social returns by accessing the rural segments of the BoP with the greatest need. The question of how to scale distribution and servicing effectively, or whether a scalable model is even beneficial to end users, is still outstanding (Chhabra, 2011).
- **Products with high quality that can compete on cost.** As the price of PV and other materials decreases, the technology will become increasingly affordable to greater segments of the BoP. This trend enables more R&D dedicated to improving product features and quality, which is an apparent current trend as product design sophistication has grown in recent years. Many distributors gather and incorporate feedback from consumers into their lantern by working with manufacturers to iteratively improve design.
- **Engagement with governments to support tariff reform.** Bureaucracy and market barriers have improved in some countries (notably: Kenya, Tanzania, Ethiopia, and Uganda), but are not widespread. The extent that companies in the field can work with governments to remove such barriers will benefit them and the industry as a whole.
- **Education to end users on benefits and entrepreneurship.** BoP customers must understand the benefits and how to use and service solar lanterns, which is a component that typically falls to distributors. Some companies use such training as marketing to streamline operations. Others provide additional training to village level entrepreneurs, who become incorporated into the business model. Because solar lanterns are a new technology replacing widely used and understood kerosene, education is a critical component to succeed.



Figure 10 The Solar Lantern Value Chain

The Value Chain

The solar lantern value chain is comprised of roughly eight segments of activity, illustrated in Figure 10 above. Below is a brief outline of the activities and sector of primary players in each value chain segment.

Materials

- What: Raw materials sourcing, such as silicon, battery electrolyte, polycrystalline, plastic
- Who: Multinational corporations (MNC), local / regional private sector companies

Design

- What: BoP user research and iterative design lab
- Who: Non-governmental organizations (NGO), private sector companies

Manufacturers

- What: Original equipment manufacturers (OEMs) to assemble the final product, including solar cell, LED chip, battery, casing
- Who: MNCs, local / regional private sector companies, social enterprises

Distribution

- What: End user distribution, including to “last mile” customers
- Who: Online retailers, NGOs networks, rural retailers, cooperatives, self-help groups, road shows and events, village level entrepreneurs (VLE)

Training

- What: Training on benefits, how to install, use, service, finance, and/or on how to be an entrepreneur
- Who: NGOs, cooperatives, self-help groups, VLEs

Financing

- What: Working capital or long-term growth funding to industry players, or microfinance to end users
- MFIs, NGOs

Service

- What: Repair and warranty of lanterns
- Who: VLEs, NGOs

The Competitive Landscape

As solar-powered technology declined in cost and market-based models grew prevalent, the industry saw a rapid rise in the number of organizations entering the field in different capacities. The team identified five primary categories in which value chain players fall. These categories are not prescriptive. Many companies are integrated across multiple categories, and many others choose a niche role within a category, for example by only providing training to entrepreneurs or microfinance to end users.

To understand the market, we evaluated 47 companies involved in the solar lantern industry for the BoP. The list of companies evaluated is not exhaustive, and tends to focus on companies in downstream markets that align more closely with BrightLight's current operations. Many more microfinance institutions and manufacturing companies are involved in this field that were not considered for this report.

Success Story: SELCO

What: Integrated, downstream social enterprise based in Bangalore

Quick Facts: 170 employees, \$450,000

annual budget, 25% growth per year

Business Model:

- Distribute through salespeople at 25 rural service centers
- Bundles lantern & servicing
- Customizes product & financing
- Leverages night vendor entrepreneurs
- Pre- and post-service as marketing

Competitive Advantage: Slow, bottom-

up growth has led to unmatched BoP knowledge and trust; in-field partner networks; business model innovation.

Future: Replicate, not scale, because scaling requires standardization. Their ideal: develop a seed capital partner for SELCOs of the future.

Gorillas

Gorillas are social enterprises or companies that “do it all.” While still relying on partners for niche work, Gorillas typically have proprietary operations across the value chain, in manufacturing, assembly, design, distribution, training, financing, and servicing. Except for materials, these are vertically integrated entities that compete on price, product quality, robustness of distribution channels, service and finance innovations, and brand.

Examples: Barefoot Power, d.light Design, ECCA, Greenlight Planet, Light Up the World Foundation

No. of companies: 15 out of 47, or 32%. Only 5 of 47 have proprietary operations in every value chain segment, the rest use partners heavily.

Upstream Players

Upstream players are typically for-profits or social enterprises that focus on manufacturing, assembly, and design of lanterns. They rely heavily on partners for distribution and have little direct engagement in upstream activities of financing, training, and servicing. As the price of PV drops and the industry matures, we predict upstream players will be forced to consolidate or close operations. Upstream players stay relevant by innovating on product design, competing on cost, developing robust partnerships, or servicing a niche user group (e.g. Native Americans). These entities require the most technical expertise as well as the most capital-intensive operations due to the manufacturing assets needed. They occasionally expand their customer base by marketing to backpackers or other developed country users. Many have manufacturing operations in China to keep costs down.

Examples: Nokero, ToughStuff International, IndiGo Solar

No. of companies: 4 out of 47, or 9%

Downstream Players

Downstream players are social enterprises, private sector companies, or NGOs that work to overcome the challenge of getting solar lanterns into the hands of rural BoP users through distribution, training, servicing, gathering feedback to inform better design, and occasionally financing. To succeed they rely on a dedicated in-field staff, and leverage their networks of partners and their knowledge of the BoP to achieve last-mile distribution. Downstream players compete through their on-the-ground presence, knowledge, engagement and trust of the BoP, logistics, marketing innovation, and partner networks. These companies are vital links to untapped markets, and will be increasingly critical as “any sustainable and replicable success would mean unprecedented bargaining power and unexpected revenue streams” (Shukla & Bairiganjan. , 2011).

Examples: Solar Sister, Beyond Solar, Earthspark International, SolarAid

No. of companies: 19 out of 47, or 40%

Financiers

Microfinance banks and working or growth capital funders play an extremely important role in making solar lanterns affordable to the BoP, and making industry players viable in the short and long term. Some organizations focus exclusively on providing for all loans for end users to purchase solar lanterns. This category also includes organizations that provide grant money to lantern providers to help fund working capital and long-term growth capital needs.

Examples: SEWA Bank, Solar for All, Citi Foundation, Canopus Foundation, International Finance Corporation

No. of companies: 7 out of 47, or 15%

Catalysts

Catalysts work at the interfaces between value chain segments to mobilize others and enable growth. These organizations are typically NGOs or Foundations who work at a high level to remove market barriers, match business to business, and provide supporting services and BoP market intelligence. For example, Lighting Africa has

Success Story: Solar Sister

What: Niche, downstream non-profit operating in Uganda, Rwanda, and South Sudan

Quick Facts: 5 employees, \$274,000 annual budget

Business Model: Like AVON, loans “business in a bag” to BoP women, including solar lantern inventory, working capital, business training, and marketing support. BoP entrepreneur revenues pay this back with interest.

Competitive Advantage: BoP knowledge, trust, partners, business model innovation, leveraging existing women’s groups, micro-consignment

Future: Pioneering distribution R&D. “Biggest challenge in scaling is identifying funding partners”³. Plan to use mobile banking and SMSs to communicate and streamline funds.

What: Solar for All provides microloans for small businesses that provide working capital and long-term growth capital needs.

Business Model: Working capital investments along the value chain (\$.5 - \$4 million); business development assistance for early stage companies; B2B matchmaking. Supported by a consortium of 50 organizations.

Competitive Advantage: Highly networked group of partners, innovative, flexible.

Future: Continuing to develop its global capacity building program; reaching new partners; expanding geographically.

developed a business support service framework that rewards companies as they deepen their commitment to the market and improve the quality of their products. These organizations compete on their partner network and thought leadership, and will remain critical until the market becomes self-sustaining.

Examples: International Finance Corporation (Lighting Africa), Energy Aid

No. of companies: 2 out of 47, or 4%

In sum, the solar lantern industry is comprised of diverse players from both for-profit and non-profit sectors. While we predict upstream operations to become more consolidated and streamlined to reduce the price of lanterns, downstream operations – in particular distribution business models – will become increasingly diverse and sophisticated as organizations customize to meet the needs of different BoP segments and locations. Market-based models will continue to gain traction and popularity, though donor-based models will remain relevant in the coming years, in particular to help fund costly distribution to the hardest-to-reach people and places.

BrightLight's Capabilities

As highlighted in the previous section, a venture's ability to create value along the value chain depends on the company's internal capabilities and the partnerships the venture has created with organizations that have complimentary capabilities. In this section we analyze BrightLight's current capabilities, map them to the value chain, and assess the risk of each capability in terms of BrightLight's ability to control them.

BrightLight currently has the following capabilities:

Capability: Marketing

Description: Members of the board have experience with marketing programs within developed markets. This adds value to BrightLight's ability to raise awareness in modern economies, build a customer base with businesses in target countries, and lend experience to the creative process of entering new markets that don't have the marketing channels found in developed nations.

Competitive Advantage: Medium. While marketing capabilities will assist with marketing to base of the pyramid customers, the advantage is somewhat muted due to the extra effort and energy required to develop so-called "social" strategies in these countries. However, using the marketing capability in developed markets to increase sources of funding from individual donors and corporations may provide a stronger competitive advantage. Few organizations in this space have waged marketing campaigns in developed countries. One notable exception comes from a related field, in which a water purification venture marketed their company through water bills in the UK and raised funding in the process.

Internal or External Capability: Internal – BrightLight does not rely on an outside partner for this capability.

Applicable Value Chain Link: Across the value chain.

Capability: Product testing

Description: BrightLight has access to resources that offer capability to test, benchmark, and compare existing products.

Competitive Advantage: Low. While this is helpful to test products for internal verification, the International Finance Corporation (IFC) produces product reports through its Lighting Africa, and soon-to-be Lighting India efforts. They are also working to produce an industry standard for quality assurance, making the results of their product testing available free of charge to the public.

Internal or External Capability: Internal – BrightLight does not rely on an outside partner for this capability.

Applicable Value Chain Link: Design.

Capability: *Fundraising*

Description: Members of the board have experience managing fundraising campaigns. This will assist BrightLight’s fundraising ability in developed markets and, in the process, raise awareness about the organization’s efforts.

Competitive Advantage: High. Many organizations in this space lack sustainable funding sources. This gives BrightLight a competitive advantage because it will help fuel the beginning stages of the organization’s growth.

Internal or External Capability: Internal and External – BrightLight does not rely on an outside partner for this capability, but its greatest potential for funding comes from its relationship with GSEP.

Applicable Value Chain Link: Across the value chain.

Capability: *Ability to convene stakeholders*

Description: BrightLight’s connections to Duke Energy and GSEP give the organization the clout necessary to pull together various companies, NGOs, utilities, and governmental players. This allows the organization to create connections that might not otherwise have existed.

Competitive Advantage: Unclear. While this may be helpful, we have yet to find a clear need for players to be brought together in this market. The successful businesses that operate in this space typically operate across the value chain and do not require assistance connecting to other players in the market. When asked what help she needed, Joyce DeMucci at Barefoot Power said, “a logistics system,” which does not require being connected to other players per se.

Internal or External Capability: Internal and External. BrightLight has begun to build its own network, but relies on GSEP for this capability in new geographies.

Applicable Value Chain Link: Potentially across the entire value chain.

Capability: *Access to utility resources – funding, energy expertise, and technical & political landscape*

Description: BrightLight is uniquely situated with connections to the largest utilities in the world.

Competitive Advantage: Low. On one hand, this capability sets BrightLight apart from its competitors. These connections provide the potential for access to capital, technical expertise, and utility assets, as well as understanding of energy landscapes around the world. On the other hand, it is clear that this problem is best approached

from a bottom-up perspective, something that utilities are not known for doing well. This fact blunts the competitive advantage of this capability.

Internal or External Capability: External – BrightLight relies on Duke and GSEP for this capability.

Applicable Value Chain Link: This has application on the consumer side of the value chain (from wholesale to servicing).

Capability: Direct Community Connections

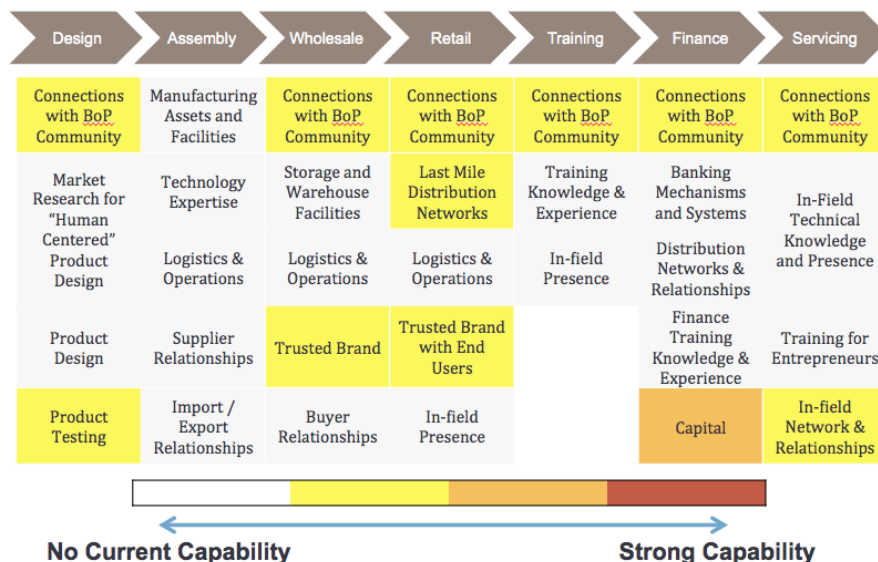
Description: BrightLight’s work in Rwanda and Argentina has connected the organization with a few NGOs who have helped distribute lights. However, these relationships are costly, have limited reach, and may not be replicable in other areas.

Competitive Advantage: Low. While these specific relationships have helped with two current pilot projects, they offer no competitive advantage for a number of reasons: 1) the pilots affect very small communities and it remains to be seen where else these organizations can help with expansion, 2) the organizations don’t appear to provide branding on behalf of BrightLight to end-users, and 3) the information we have gleaned from these partners has been less useful than it could have been judging by their reports.

Internal or External Capability: External – BrightLight relies on its NGO partnerships for this capability.

Applicable Value Chain Link: Throughout the value chain, with the exception of assembling the lights.

To better understand where BrightLight’s strengths lie in the sector of interest, solar lanterns, we mapped the organization’s current capabilities to the value chain (see 11a). We populated this table with the capabilities that were either implicitly or explicitly apparent throughout our research from both primary and secondary sources. As noted below the table, the darker the color the stronger BrightLight’s capabilities in that area. This analysis suggests that BrightLight’s current capabilities are not directly linked to any specific part of the value chain. Rather, as Figure 11b highlights, BrightLight’s strengths are indirectly related to the value chain, providing unique challenges and possibilities for BrightLight’s future.



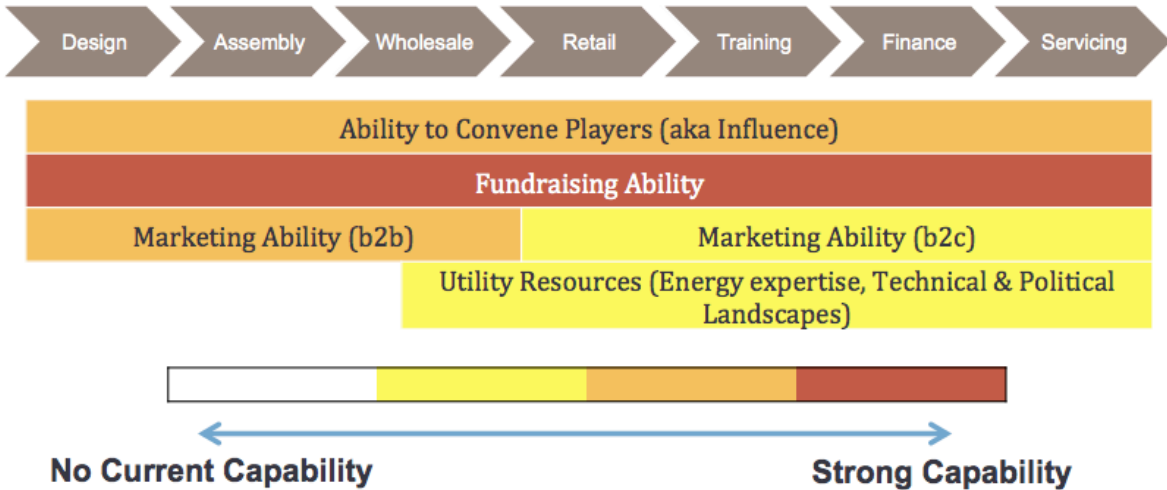


Figure 11b Value Chain Capability Heat Map – Indirect Capabilities

Assessing BrightLight’s Capabilities Competitiveness and Risk

Another useful analysis is to compare how much control BrightLight has over their capabilities and the competitive advantage those capabilities offer. This offers insight into what risk BrightLight currently has in managing their most competitive capabilities. Figure 12 below measures these along two axes: the horizontal axis measures the extent to which BrightLight has control over the capability; the vertical axis measures the competitiveness of the capability. (Note: Figure 13 uses the same colors from the heat map analysis; the darker the color the stronger the capability.)

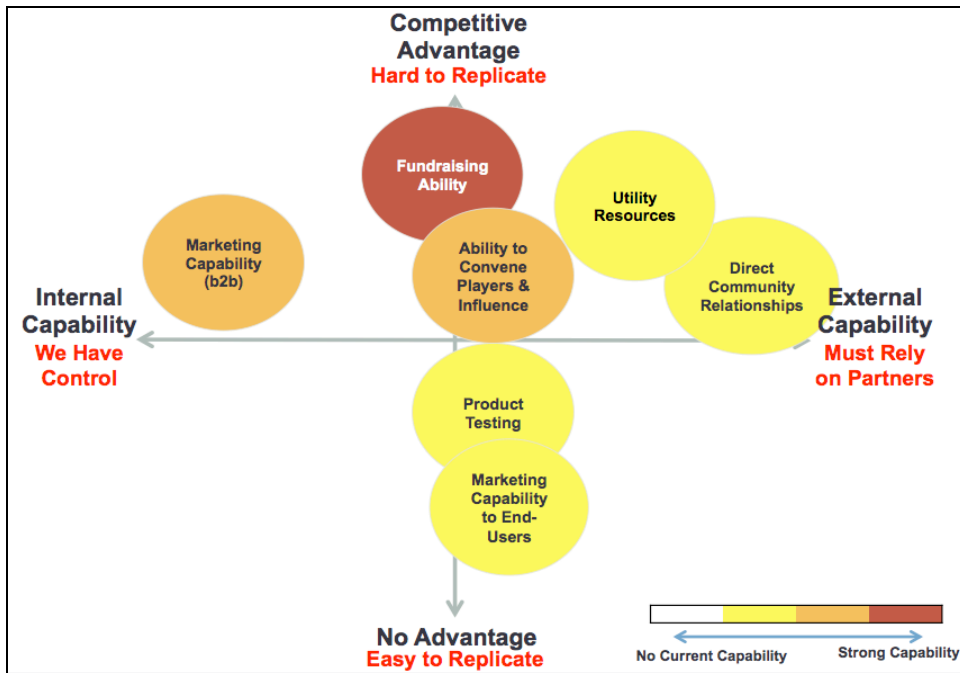


Figure 12 Capabilities Competitiveness & Risk Map

Though the true competitiveness of a capability will depend on a number of external factors, the competitive analysis suggests that BrightLight’s current capabilities are

generally competitive. However, the risk analysis also suggests that BrightLight is dependent on its current partnerships for many of its capabilities, though it has equal control over its most competitive features (fundraising ability and influence).

A Word About Capabilities

Mapping current capabilities to the value chain as well as assessing the competitiveness and risk of each capability is meant to simply show where BrightLight's current capabilities lie so that we can understand BrightLight's current value position. Ultimately, the value that BrightLight will bring to end-users and participants along the value chain will depend on the operating model it chooses. Similarly, the competitiveness of BrightLight's capabilities will depend on its business model. Despite this, these exercises are useful starting points when considering what type of organization BrightLight hopes to become so that we can strategically choose a model to fit its current capabilities or acquire new capabilities to fit a new model or both. One thing is clear: no matter what type of organization BrightLight hopes to become, it will require additional capabilities to the ones it currently has. We view this less as a challenge and more as an opportunity.

Alternative Models for BrightLight

Effective strategic planning approaches need to focus first on an over-arching question: What kind of organization does BrightLight want to become? Answering this question will provide means for BrightLight to:

- Set objectives for long-term performance of the organization;
- Analyze potential opportunities or threats from existing internal and external factors;
- Generate strategic options for addressing important issues; and,
- Choose from among potential opportunities and actions.

“Scenarios are stories. They are works of art, rather than scientific analyses. The reliability of [their content] is less important than the types of conversations and decisions they spark.”

~ Arie de Geus

As mentioned previously, this report has been structured to support a “scenario” process where BrightLight can make informed decisions about its future organizational mission and structure. Informed by the detailed environmental scan of the external market and analysis of BrightLight's internal capabilities provided earlier in the report, we can now begin to explore the different alternatives or “scenarios” for BrightLight's future.

Scenario planning is a method of assessing potential futures by understanding the nature and impact of the driving forces affecting the organization. The benefit of this approach is to create a conversation that will lead to consensus about BrightLight's strategic focus, which in turn will set the foundation to begin work on a detail business plan for BrightLight's future. An additional benefit of the scenario process is that it requires the participation and knowledge exchange of the board, increasing the validity and robustness of the group's vision. Ultimately, scenario planning offers BrightLight a disciplined method

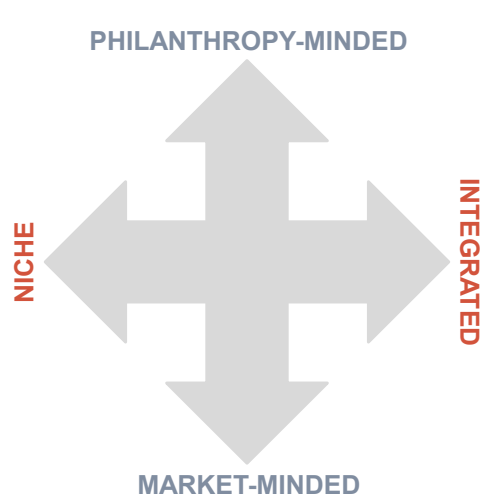
to discover the implications of potential organizational structures so that the board can make informed decisions.

Scenarios, then, offer possible views of BrightLight’s future. And, by exploring the range of possible futures, BrightLight’s strategic, tactical, and organizational decisions will be better informed. Approaches based on this knowledge and insight will be more likely to succeed. This approach will serve to “make the unconscious conscious” by providing information and options for the organization’s desired purpose (Bell, Masaoka, & Zimmerman, November 9, 2010).

Drivers of Organizational Purpose

Throughout our research, the organizations we researched implicitly suggested that their position along the value chain was defined by two choices: the first is whether they were market or philanthropy focused and the second was whether they would operate in multiple value chain segments or in one segment. Their answers to those questions determined the extent to which they undertook activities in one or many of value chain segments and the commercial and social mission of their work. Identifying BrightLight’s goals along these two spectrums – mission and value chain segment – are critical to determine the purpose and impact of the organization.

To facilitate the discussion and decision about BrightLight’s structure, we developed a two-by-two framework along the mission and value chain spectra. Our two-by-two approach offers a way to navigate the dynamic and complex nature of organizations by using opposition and creative tension while simultaneously involving all stakeholders in identifying BrightLight’s future (Lowy & Hood, May 4, 2004).



The Axes

The following axes outline the trade-offs between various types of organizations and offerings. Knowing where an organization sits in this continuum is as critical to its existence as the products or services it provides. Identifying BrightLight’s position on this spectrum will clarify the organization’s strategy going forward (Gair, December 2005).

Vertical Axis: Organization Spectrum

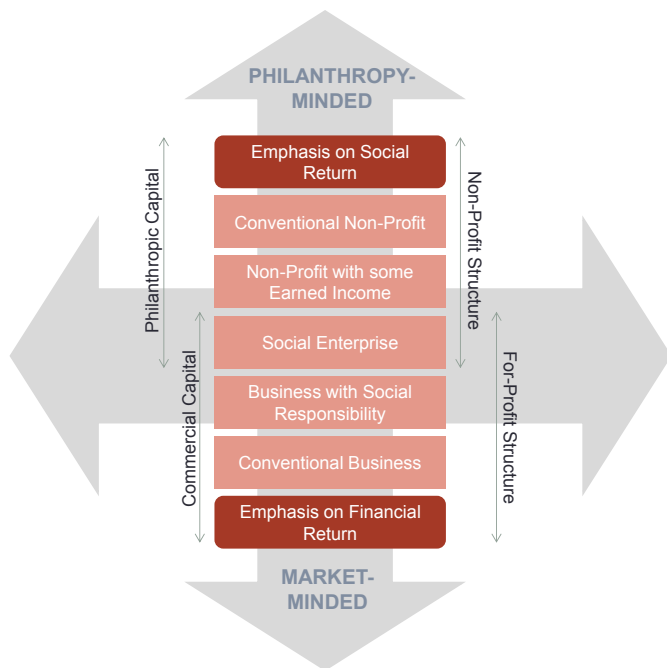
The vertical axis provides a spectrum of organizational structures. Placing an organization towards the top results in an organization that is more focused on social return, whereas placing an organization lower on the spectrum suggests the organization is more focused on commercial return. An organization in the middle tries to balance the two evenly.

Horizontal Axis: Offering Spectrum

The horizontal axis provides a spectrum of offerings. Placing an organization to the right results in an organization that is fully integrated, offering products or services in multiple segments of the value chain. Placing an organization to the left suggests the organization is focused on a specific segment of the value chain.

Please note that this analysis is not intended to define BrightLight’s specific operating model, but rather to determine what type of organization BrightLight should become. The latter must be addressed before the former can be designed. As the old saying goes, “If you don’t know where you are going, any road will take you there.” So it is with BrightLight – first we must determine what BrightLight will be, then we can determine how it will do its work.

Organization spectrum (vertical axis)



The extremes, or “edges,” of this spectrum reflect organizations that, at the top of the axis, are philanthropy minded (i.e., a pure non-profit) or, at the bottom of the axis, are market-minded (i.e., a pure for-profit). These organizational structures are more than just a reference to legal status; they define the primary motivation of the organization. Furthermore, some organizations operate in the middle by blending both “edges” (e.g., high-efficient non-profits, for-profit social enterprises). Organizations with blended motives have been driven by the emergence of greater social entrepreneurship over the past few years. These pressures can co-exist productively within an organization, but tend to move an organization in one direction over another (Gair, December 2005).

Figure 13 Organizational Spectrum

Philanthropy-Minded

Philanthropy-minded organizations have historically served to fill private sector gaps. In some cases, these needs are handled inadequately by non-profits due to difficulties in measuring and comparing performance and impact of the work, the sector’s incomplete financial structure, and the undervaluing and underfunding of their work (Gair, December 2005).

Numerous benefits exist with a philanthropy minded organization. They clearly communicate their mission because every decision is rooted in having a social impact. An organization of this nature does not cost much to establish, although the paperwork necessary to offer tax benefits to donors can be burdensome (Brozek, 2009). Philanthropic dollars are available to these organizations through individual donors or grants (most of which are project based), and can engage volunteers to provide free services and support

activities (Cutt & Murray, 2000). Since non-profits do not have shareholders to whom they report or deliver returns to in the short term, they do not suffer from a conflict of financial and social objectives. This allows these organizations more time to refine their operating model (Dees, January/February 1998).

Conversely, non-profits have been known to lack agile or quick processes. The reasons for this attribute run the gamut and depend largely on the organization’s efficiency. Fundraising inconsistency and the labor-intensive fundraising cycle pose challenges in gaining scale and can mean an organization is undercapitalized and inefficient (Brozek, 2009). As

Table 1 Comparison of Market-Minded & Philanthropy-Minded Organizations

Philanthropy-Minded	Market-Minded
<ul style="list-style-type: none"> • Deeply focused on evaluating a need and living up to a social mission • <u>Offering</u>: Provide product and services for free • <u>Addressing</u>: Needs satisfaction • <u>Capital</u>: Funds come from philanthropic investors only (e.g., foundations, philanthropists, etc.) <ul style="list-style-type: none"> – Philanthropic entities find it easier to fund non-profits for legal reasons, and many programs are set up to be available only to non-profit organizations • <u>Control</u>: Typically management controlled opaque entities. Mission priorities depend on the commitment of management 	<ul style="list-style-type: none"> • Deeply focused on evaluating customer, target market and staying competitive • <u>Offering</u>: Provide product and services for a price • <u>Addressing</u>: Market development • <u>Capital</u>: Funds come from early stage investors <ul style="list-style-type: none"> – Market minded organizations can provide equity returns which non-profits are legally incapable of doing • <u>Control</u>: Board controlled transparent entities where management is replaceable, but mission, is safeguarded

such, philanthropic organizations must be careful when investing in activities other than direct “charity” activities because spending can be highly scrutinized (Cutt & Murray, 2000).

A few key implications to keep in mind about purely philanthropic or non-profit organizations are:

- Challenges in new market expansion;
- Must determine how to operate with less funding and/or with inconsistent funding sources;
- Must anticipate and prepare for concern over philanthropic spending and approaches to meeting mission objectives;
- Tensions exist between value and sustainability (e.g., impact of programs versus donor objectives);
- Maintaining program stability; and,
- The need for transparency to external audiences about spending decisions and measuring social impact.

Market-Minded

Market-minded organizations are typically characterized by a focus staying competitive in order to maximize shareholder profit. Without a dependence on donations or grants, there are several avenues or sources in which to raise capital, such as revenue, investment, or debt. Driven by a management team, decisions can be made quickly, making the organization inherently agile to respond to market needs (Fruchterman, Spring 2011).

If a market-minded organization seeks some tangential “social-mission”, there is no guarantee this can be preserved as the company grows. If a social mission is perceived to

detract from the earnings of investors or shareholders, it can be difficult to justify and may, ultimately, be minimized or done away with altogether (Brozek, 2009). Fiduciary duty is key and control may be somewhat diffuse.

Some key implications to keep in mind about market-minded organizations include:

- Responding to changing environments and needs requires flexibility;
- They have a stronger ability to expand to new markets;
- Significant consideration must be given to managing and meeting investor expectations; and,
- Must prove value to investors through quantification of financial impact.

A Third Way: The “Hybrid” Spectrum of Organizations

An increasing number of forward-looking nonprofits are beginning to appreciate that increased revenue, focus, and effectiveness can come from adopting “market minded” business approaches. At other end of the spectrum, many businesses are beginning to realize the importance and value from incorporating social objectives into their activities. It is important to recognize a third way of “hybrid” organizations that combine both social and financial objectives to some extent. As one moves closer to being market-minded, while still having an eye to social good, organizations can be agile, have programs that fund themselves, and still “live” their vision (Gair, December 2005). The following descriptions outline the various types of organizations in the “Hybrid Spectrum:”

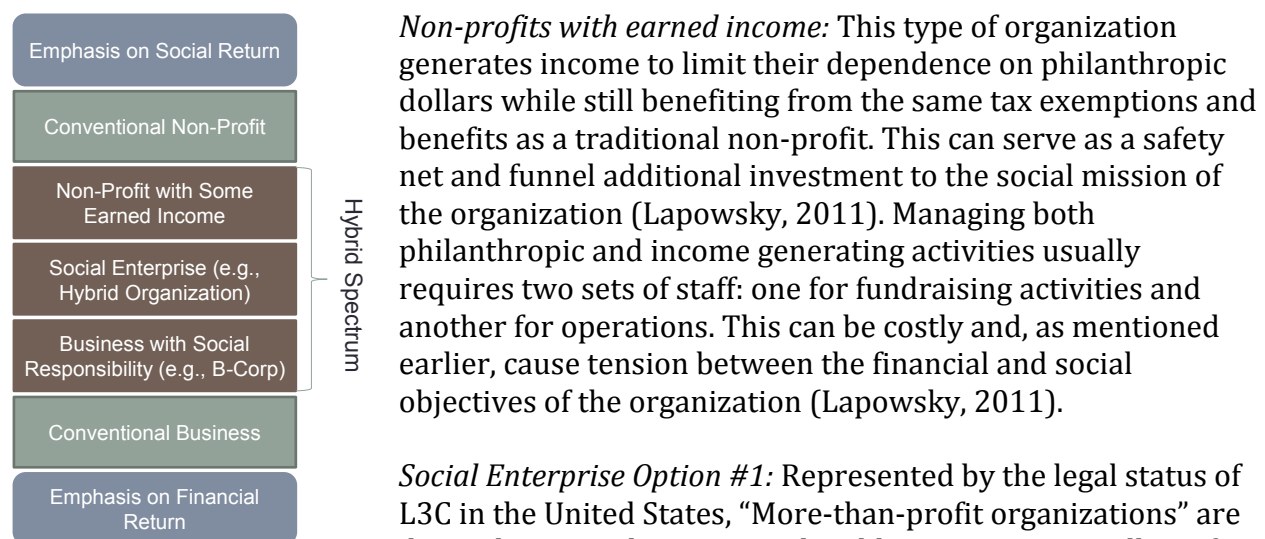


Figure 14 Hybrid Spectrum of Organizations (middle three segments)

Non-profits with earned income: This type of organization generates income to limit their dependence on philanthropic dollars while still benefiting from the same tax exemptions and benefits as a traditional non-profit. This can serve as a safety net and funnel additional investment to the social mission of the organization (Lapowsky, 2011). Managing both philanthropic and income generating activities usually requires two sets of staff: one for fundraising activities and another for operations. This can be costly and, as mentioned earlier, cause tension between the financial and social objectives of the organization (Lapowsky, 2011).

Social Enterprise Option #1: Represented by the legal status of L3C in the United States, “More-than-profit organizations” are driven by a social mission and, unlike an LLC status, allows for investment from foundations, individuals, and government agencies (Baghranyan, N.D.). Revenues are the primary source of income. By employing market mechanisms, the organization

is able to drive operations and achieve social objectives (Alter, 2006). Social enterprises can attract funding and foundation support with their market-based strategies (Gair, December 2005). However, philanthropists are sometimes reluctant to give grants to profit-making organizations, while commercial investors are wary of investing in organizations driven by a social mission (Chertok, Hamaoui, & Jamison, Spring 2008).

Social Enterprise Option #2: In this case, nonprofit and for-profit mechanisms are linked, in many cases as a subsidiary of the other (e.g., a for-profit arm of a non-profit). In some cases, two organizations partner to fulfill a basic need for the other (Lapowsky, 2011) allowing one entity to benefit from non-profit legal status while the other benefits from the ability to raise funds from investors. Their legal separation provides greater flexibility, but can get complicated. Separate staff and boards are often formed to avoid conflicts of interest. This can slow down activities by requiring twice the number of staff and board approvals for every transaction (Lapowsky, 2011).

Business with Social Responsibility: These organizations represent a new corporate approach that “takes into account not only shareholder interests but also the interests of their employees and the communities and environments where they operate; and... meet a set of social and environmental performance standards” (Billitteri, January 2007). However, B-Corp status can be difficult since the organization must quantify both their social and commercial impacts (Lapowsky, 2011) (The Capital Institute, 2010).

When each organizational structure is most appropriate

With the diverse set of options available, and the advantages and disadvantages listed above, there are also certain conditions in which each organization type is most appropriate. Table 2 outlines the ideal situations for each organization option:

Table 2 Criteria for when an organization is most appropriate

Non-Profit	Non-Profits with Earned Income	Hybrids	B-Corps	For-profit with social mission
<ul style="list-style-type: none"> The user cannot pay Perception of impartiality needed – those who support a cause want to money to go to a cause not a bank account 	<ul style="list-style-type: none"> The nonprofit has a valuable product or expertise The user has some ability to pay The nonprofit's mission is job training or skill building 	<ul style="list-style-type: none"> The nonprofit's unrelated business income threatens its nonprofit status The for-profit needs help managing its philanthropy Each entity needs something offered by the other 	<ul style="list-style-type: none"> A business has more than one social impact. You want access to impact investors – can quantify social impact 	<ul style="list-style-type: none"> The product or service being sold triggers social or environmental change The user has the ability to pay most, if not all, of the purchase price. The product or service is a response to market demand. The social impact is intrinsically tied to the business proposition

Offering spectrum (Horizontal Axis)

The extremes, or “edges,” of the offering spectrum reflect an organization’s focus that, at the left side of the axis, operate as a “*niche*” organization or, on the right side of the axis, operate as an “*integrated*” organization. Based on our previous value chain analysis, having a *niche* offering means that an organization is focused on a single, well-defined segment of the value chain, such as training. A niche organization is focused on replicability in new markets. On the opposite end of the spectrum, a highly *integrated* organization would find an organization with operations along multiple segments of value chain, such as “Gorilla”

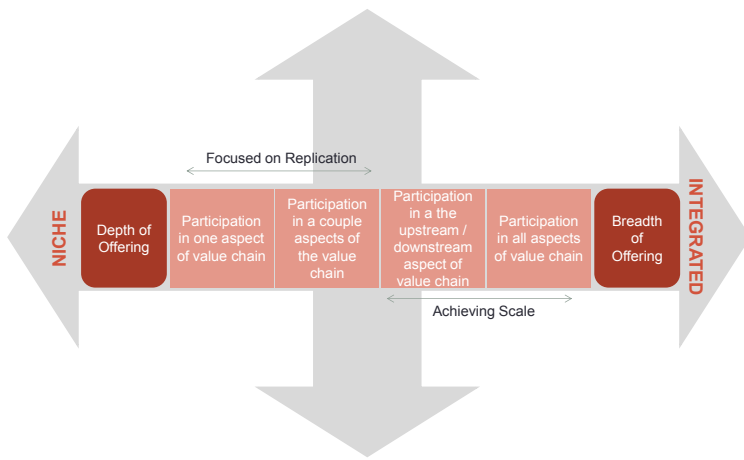


Figure 15 Offering Spectrum

businesses start out as niche companies with narrowly defined specializations, only some stick to their niche as they grow. Others branch out and expand their offerings, particularly if their goal is scale, rather than replicability, in multiple markets. Niche companies have several advantages over integrated organizations. A focused offering allows an organization to establish strong relationships with their target end-users and becomes intimately familiar with their needs. This tends to build loyalty and trust because the organization is better positioned to offer relevant products and services to their target demographic.

Over time, a niche company can develop a positive reputation for its work in a given field. This reputation allows a niche company to position itself as a leader and expert in the field. However, by trying to satisfy specific needs, it can be costly or difficult to address multiple segments. In the case of niche social enterprises, much of the impact is achieved through influencing others or by building coalitions to align objectives. In the most difficult markets, niche BoP business models must use networks to share technology and jointly produce goods and services in order to get that a larger enterprise can achieve alone (Kumar, April 22, 2010).

Key implications to consider about niche offerings include:

- Ease of planning through specific clear objectives;
- Increased ability to expand into other areas of value chain;
- Strategic advantage in marketing through close relationships with the market;
- Easier to produce new products, change policies, and manage public relations based on feedback from customers; and,
- Requires extensive networking and collaboration to realize objectives.

organizations who operate in all but a very few segments. Integrated organizations have diversified, often-complementary offerings that serve multiple markets and segments.

Niche

A niche company is a business that focuses on a particular type of product within a specific market segment. Niche companies focus on doing one thing well. While many

Table 3 Comparison of Niche & Integrated Offerings

Niche	Integrated
<ul style="list-style-type: none"> • Subset of the market on which a specific product is offered • Serving a homogeneous market • Defines a specific product / service aimed at satisfying specific market needs • Replicable in numerous markets 	<ul style="list-style-type: none"> • Products / services developed and offering across the value chain, united through a common organization • Potentially serving a heterogeneous market • Products across the value-chain combine to satisfy a common need • A method seen to avoid the “hold-up” problem*

***“Hold-Up” Problem: Two parties (such as a supplier and a distributor) may be able to work most efficiently by cooperating, but refrain from doing so due to concerns that they may give the other party increased bargaining power, and thereby reduce their own profits*

Integrated

At the opposite end there are organizations that offer an integrated set of offerings. In addition to lower transaction costs, the greatest benefit of being integrated is the synchronization of supply and demand along the value chain. This leads to lower uncertainty in planning, strategic independence, and the ability to scale effectively. Unfortunately, integrated offerings entail high coordination costs and increased complexity due to the need to run several operations under one single entity. Diversified companies also face challenges when attempting to adapt to new markets and customer needs. These organizations require a higher monetary outlay to switch strategies. Greater diversification along the value chain also poses the challenge of maintaining motivation for good performance across the entire supply chain.

Some key implications to keep about integrated offerings are:

- Requires a rigid organizational structure to manage a breadth of activities;
- Increased opportunities for growth or scaling with reduced uncertainty; and,
- Costly or difficult to meet specialized needs.

Scenarios

When considering the intersection of each extreme along both the Organizational and Offering Axes, we gain further understanding of the organizations that exist at the edges. With an eye to the market in which BrightLight seeks to operate, we have constructed several scenarios and case studies of organizations that operate at each intersection. Note that each scenario below requires specific capabilities that BrightLight may either need to acquire.



Figure 16 Scenario Matrix of Organization & Offering Combinations

Scenario #1: Market-Minded Niche Organization

An organization operating at this intersection is driven by the need to support market development. To achieve this they focus on strengthening their capabilities within a single category of the value chain. Networks are essential to the success of these organizations, particularly within difficult markets like the BoP, as collaboration is required to build a sustainable market. Although these organizations create value independently through earned income, they get the value of a larger enterprise through this extended network.

A useful example of an organization that well-represents this quadrant is Osram Sylvania's O-Hubs. Osram seeks to address the challenge of bringing light to those in Africa not currently connected to an electrical grid. In order to do this, they offer a renewable energy hub, the OSRAM Energy Hub, or O-Hub, where consumers can access products and power through



an “energy rental” model. Each O-Hub is fueled by solar energy or, where possible, to existing grid assets. O-Hubs offer several rental options:

- Battery boxes - rented on a daily basis and returned in exchange for a fully charged one;
- LED lanterns - designed in Germany using Sylvania technology and rented similarly to battery boxes; and,
- Mobile phones chargers - in partnership with Nokia.

The pilot was initiated in April 2008 in Mbita, Kenya, around eastern Africa's Lake Victoria, to address the needs of local fishermen and their communities. Local fishermen spend up to 70% of their income on kerosene for nighttime sardine. Through on-the-ground research and an understanding of potential users, Osram believed that there were enormous benefits in offering inexpensive, clean light.

Osram has seen mixed results, but the strongest receptiveness is to their battery boxes and mobile phone chargers. Osram has refined their strategy and are moving the project forward. There is potential to see up to ten hubs in Africa over the next three years with an investment of \$6.5M USD and partnerships with regional organizations such as utilities, NGOs, and microfinance institutions. Osram is also considering expansion to India.

A capabilities analysis of Osram provides a vivid example of a market-minded niche organization: there were a number of capabilities uncovered that appeared to support their success and potential for replicating the O-Hub model further. These capabilities are outlined, using the same two-by-two matrix from our analysis of BrightLight’s capabilities, below:

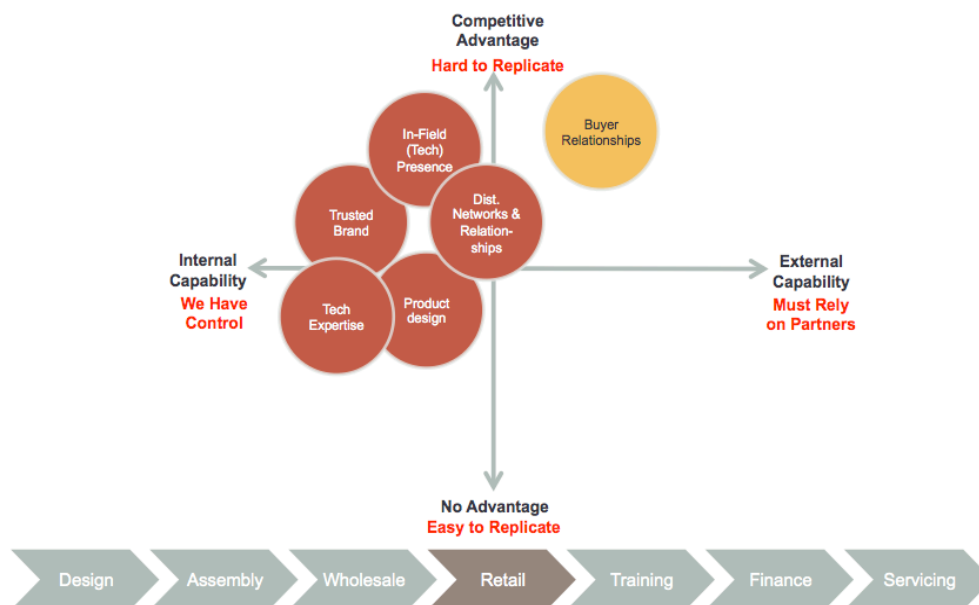


Figure 17 Osram Sylvania O-Hub's Capabilities

Scenario #2: Market-Minded Integrated Organization

Utilizing a profit-generating business model, a market-minded integrated organization develops and sells a range of products, services and consumer financing, training and end-user support under a single entity. We call these enterprises “Gorillas” because of their dominance in the market. These fully integrated organizations are autonomous and, due to the breadth of their offering, can earn income from both upstream and downstream activities, such as selling solar lamps in a B2B setting or a B2C setting to final end users in the BoP.

An example of this type of organization is Selco India. Established in 1995, Selco provides sustainable energy solutions and services to under-served households and businesses in India. Selco’s primary activities encompass:

- Creating, distributing and selling products based on end user needs: going beyond just being a technology supplier and customizing products based on individual needs in collaboration with manufacturers. Through the use of OEMs, Selco is able to produce solar solutions to their specifications based on the “human centric” design approach to meet user needs.
- Installation and after-sales service: Dedicating regional energy service centers to ensure prompt maintenance and service.
- Standardized financing packages: Creating channels for end users to afford systems based on their cash flow.

Considered one of the “golden children” in the market, Selco was conceived in an effort to dispel three myths associated with sustainable technology and the rural customer base, including: 1) poor people cannot afford sustainable technologies; 2) poor people cannot maintain sustainable technologies; and, 3) social ventures cannot be run as commercial entities. Based on our research and the insights provided from interviews, it appears that Selco is dispelling these myths with great aplomb.



As our analysis in Figure 18 highlights, Selco has great control over their capabilities, which are highly competitive:

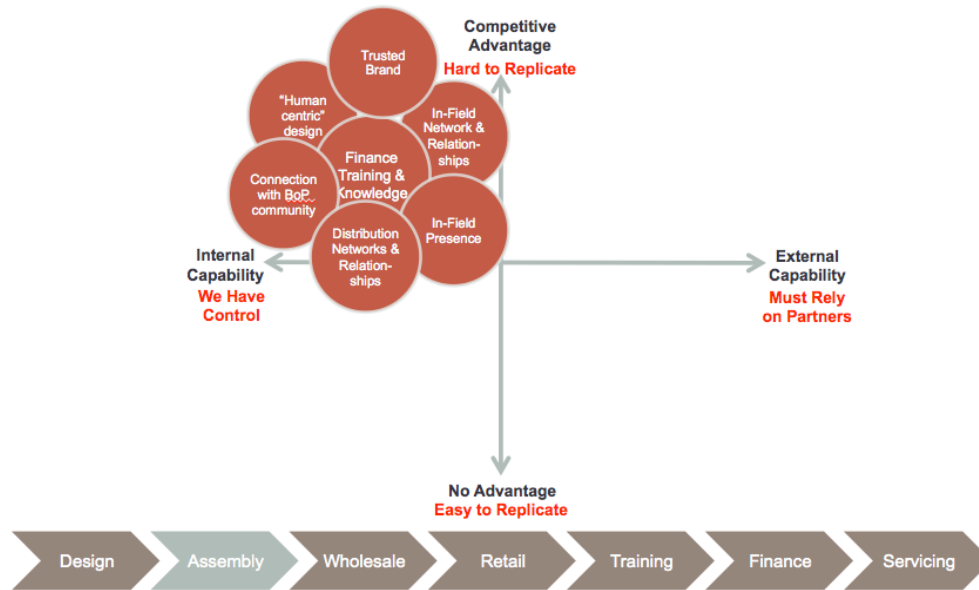


Figure 18 Selco's Capabilities

Scenario #3: Philanthropy-Minded Niche Organization

Organizations that are philanthropy-minded and provide a niche offering can take many forms: giving away products, helping others distribute products to the customer at no cost, funding development of a particular segment in the value chain, training end users and entrepreneurs, or acting as a grant organization. No matter what product or service is provided, activities are driven by a social mission and are fuelled by a range of philanthropic income sources. Without donations and grants, the organization cannot pursue activities towards their set out mission-based objectives

A stellar example of a philanthropy-minded niche organization is Solar Sister. Based out of rural Africa, Solar Sister eradicates energy poverty by empowering women with economic opportunity. Utilizing the potential of solar technology with a deliberately woman-centered direct sales network, Solar Sister seeks to bring opportunity to even the most remote African communities. The founders of Solar Sister believe that women can play a vital role in providing clean energy to their communities while making them contributing members to their local economy and creating a chain reaction of social impact. Although their reach and impact is wide, their activities focus on a single point in the value chain: training for women entrepreneurs to build a market for solar energy. Solar Sister directly provides and trains women with a 'business in a bag,' a start-up kit of inventory, training and marketing support. In essence, these women entrepreneurs use an Avon-style distribution system that is catalyzed by Solar Sister to create vital access to clean energy technology by building and extending the supply chain through women's rural networks.



As our analysis in Figure 19 highlights, Solar Sister highly competitive capabilities and rely, in part, on partners to serve their market:

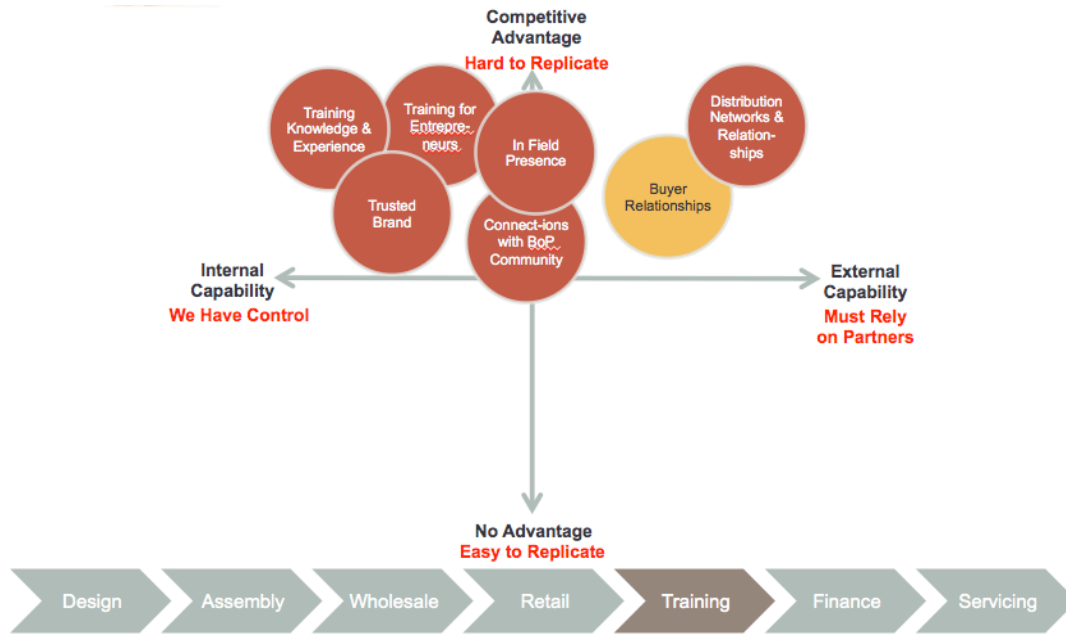


Figure 19 Solar Sister's Capabilities

Scenario #4: Philanthropy-Minded Integrated Organization

Due to inconsistency in funding sources, an integrated philanthropic organization will often have small involvement in many areas of the value chain (often downstream), filling “holes” where market-minded organizations are not focused. A strong role in market development is not core to this type of organization, but the need to “fill in” where others are lacking is driven by the need to meet a social need of the energy poor. Since it can be difficult to provide products and services across the full value chain through philanthropy, an organization may instead take on the role of providing project funding to existing players as a Foundation, or as an organization that utilizes its network to provide insight into how to better provide services to the BoP.



Launched in 2006, SolarAid, is a stellar example of a philanthropy minded integrated organization. SolarAid is enabling the world's poorest people to have access to clean and affordable power, and to do so in two ways: microsolar and macrosolar products. SolarAid’s macrosolar activities focus on rural areas of East and Southern Africa installing solar on schools, community centers, and clinics. This macro strategy focuses on direct provision of power to those institutions that have been shown to foster wellbeing and development in poor and BoP, but also those that struggle to afford power. SolarAid’s microsolar activities, on the other hand, train local entrepreneurs with sales and marketing techniques to manage their own businesses and generate independent income by selling our solar-powered SunnyMoney products. This is one of the more successful philanthropic, integrated organizations within the current market.

Its success, however, is very much attributed to the capabilities of the organization. As Figure 20 highlights, SolarAid's Primary capabilities are competitive and require partnerships for success:

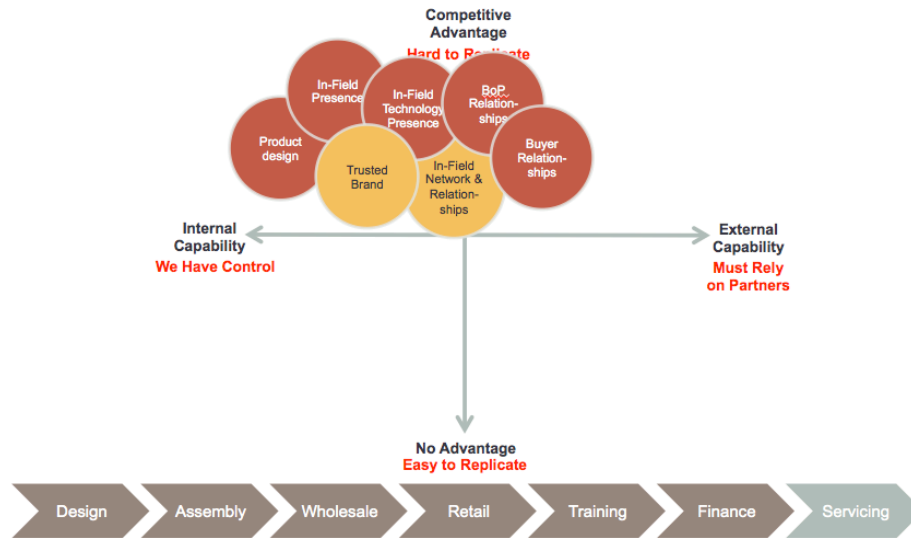


Figure 20 SolarAid's Capabilities

Catalysts

Putting reliable solar power systems into the hands of poor and remote villagers is not easy and often requires additional support or funding to facilitate the penetration of solar in energy starved poor communities. The last role is that of the 'Catalyst,' an organization that does not have a direct role in the value chain, but serves as an interface or enabler for those that are providing direct services within the value chain.

Malcolm Gladwell, in his book, "The Tipping Point" (Gladwell, 2000), described key roles that, although not specific to the context of providing light to the BoP, can nonetheless be applied to describe the Catalyst: *Connectors, Mavens* and *Salesmen*.

Table 4 Connectors, Mavens, and Salesmen

CONNECTORS	MAVENS	SALESMEN
<ul style="list-style-type: none"> • People who "link us up with the world ... people with a special gift for bringing the world together" • Knack making friends, acquaintances and contacts • Utilize social networks to support that efforts of other players or enable the success of an initiative through tapping into one or many of their networks • Not directly involved in the delivery of a product or service 	<ul style="list-style-type: none"> • "Information specialists" that can be relied upon to connect market players with new information • They accumulate knowledge, especially about the marketplace, and know how to share it with others. • "Almost pathologically helpful" due to a level of expertise from knowledge and ability to communicate • Information brokers, sharing and trading what they know in support of a broader goal 	<ul style="list-style-type: none"> • "Persuaders" who utilize their charisma and powerful negotiation skills to support the market • An indefinable trait that goes beyond what they say, which makes others want to agree with them

Gladwell, Malcom. "The Tipping Point: How Little Things Can Make a Big Difference ", 2000.

Scenarios: Summary of Options

As noted above, there is a range of options from which to choose. In order to choose the best organizational structure and which segment(s) along the value chain to occupy, the BrightLight board should first agree upon a set of *guiding principles* that inform the organization's core. To assist with this process, we have developed the following framework:

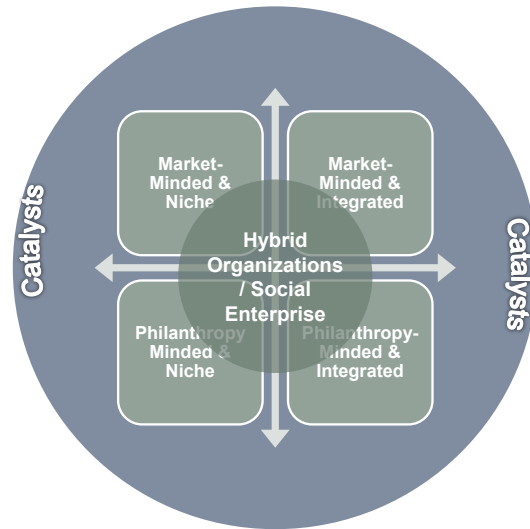


Figure 21 Range of Options for BrightLight's Future

Rational for Guiding Principles

Guiding principles are crucial to leaders and organizations for the following reasons:

- They are the fabric of the personal and organizational mind-set;
- They shape the organization's core purpose;
- They enable both internal and external stakeholders to measure organizational vision and direction;
- They provide the instinctive grounding for decisions that support the organization's goals; and,
- They define desirable behavior and actions.

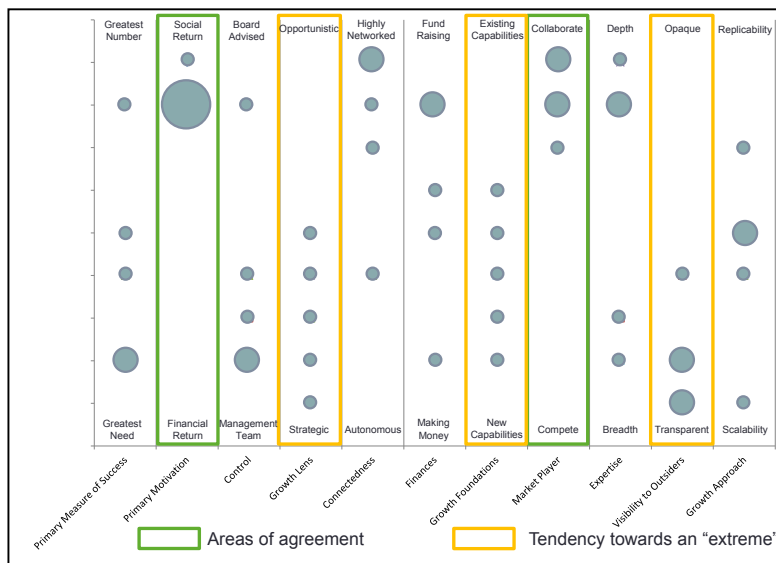
These principles are particularly important to the process of determining where a leadership team believes an organization should position itself in the framework displayed in Figure 20. This is due to the fact that they:

- Are more descriptive than the mission statement;
- Describe what can be expected of the organization in various situations;
- Provide structure and guidance; and,
- Serve as the foundation from which strategic planning and goal setting should flow.

Table 5 Guiding Principles Options for BrightLight

Category	Guiding Principle Spectrum		
Primary Measure of Success	Greatest Need	↔	Greatest Number
Primary Motivation	Financial Return	↔	Social Return
Control	Management Team	↔	Board Advised
Growth Lens	Strategic	↔	Opportunistic
Connectedness	Autonomous	↔	Highly Networked
Finances	Money Making	↔	Fund Raising
Growth Foundations	Build new capabilities	↔	Capitalize on existing capabilities
Market Player	Compete	↔	Collaborate
Expertise	Breadth	↔	Depth
Visibility to Outsiders	Transparent	↔	Opaque
Growth Approach	Scalability	↔	Replicability

Figure 22 Results of Guiding Principle Survey



Principles important to an organization depend entirely on the market in which the organization operates. As such, several extremes were selected to indicate the range of guiding principles available for BrightLight to agree upon.

The results, based on a majority of the BrightLight board, are indicated in Figure 22. Only two of the 11 guiding principles, demonstrated close agreement among respondents. However, the remaining options did not have agreement. At best, there are three other categories there was a tendency towards agreement.

It is imperative that a general agreement exists in each of these. This will allow for the BrightLight team to decide upon which scenario to choose. This, in turn, will serve as the key driver for BrightLight's strategic actions going-forward.

III. Next Steps: A Business Plan to Catalyze Change

Foundational Components

Mission Statement

Global BrightLight Foundation's goal is to make solar energy accessible and affordable to people worldwide who are currently living without access to electricity. This focus will allow GBF to contribute to the improvement in standard of living and quality of life of the unelectrified through providing energy sources that are cost-efficient, effective and safe.

Strategy

There are numerous roles that an organization might play in providing globally accessible and affordable energy solutions to improve the education, community environment, economic opportunities and quality of life of those living in countries and villages that currently lack access to electricity. GBF will serve as a synergistic connector, integrator and catalyst, facilitating delivery of region-specific, service-effective and cost-efficient means to access solar-powered energy usable on an individual, family and community scale.

GBF's strategy recognizes the systematic nature of new market development and creates a new system of value creation through providing power to the unelectrified of the world. Unlike entities that provide a single offering GBL creates a network of players that have different positions in the value network to avoid competitive conflicts and focus on providing benefits to the communities we serve. By recognizing the potential to create a value network around a new model for electrification for the poor and developing world, GBF will play a key role in fostering not only the electrification but also the economic development of those at the base of the pyramid.

Goals & Objectives

The following organizational goals and objectives of the support the execution of GBF's strategy in order to fulfill its mission statement:

- GBF will identify and connect solar technology designers, manufacturers and distributors with national and international donors, regional NGOs and local leaders to provide individuals, families, and their communities with access to solar PV (photo-voltaic) systems.
- GBF will facilitate and develop distribution networks together with local organizations and individuals to support the development of a new market. GBF will work with both for profit and not for profit organizations at a local level to develop an efficient distribution system for solar PV systems to end users.
- GBF will work with local organizations (e.g., NGOs) and leaders to ensure ownership by and benefit to the affected individuals, families, and communities.
- GBF will choose region-appropriate solar system solutions, with an initial focus on portable solar PV systems that are functional at the individual or family scale, yet are scalable across communities and regions, possibly leading to PV micro grid systems.

- GBF will work with technology designers and manufacturers to ensure that the design of solar PV systems meet the expressed needs of the off-grid individuals, families and communities where they live.
- GBF will continually research the field in order to stay relevant, identify and integrate best practices, and build a strong value network.
- GBF will be a catalyst to bring together socially-minded donors to fund its work and programs.

Guiding Principles

To guide our work, GBF developed a set of guiding principles. These guiding principles focus our efforts to facilitate the development of a new value network for providing power to the poor. GBF's guiding principles are:

- GBF will target projects and programs to deliver energy to the *greatest number* of individuals who currently lack access to affordable power.
- GBF will focus on being *highly networked* in order to *collaborate* around service / product delivery to the unelectrified rather than assuming ownership of service delivery.
- GBF decision-making and operations are *management team-led*, with board advisement in regards to significant strategic decisions that relate to the future direction of the organization.
- GBF will operate through a combination of *fundraising* and *revenue generation*.
- GBF will focusing on building *depth of knowledge surrounding the breadth of players* and requirements needed to develop and reinforce a value network around offering electricity to those currently without access.
- GBF will focus on *scalability* of initiatives, rather than replicability, recognizing the unique nature of the needs of the unelectrified in different areas of the world.
- GBF will be driven by providing *social return* to the communities in which it works, rather than deriving a financial return from the sale of solar PV systems. Any financial return will be derived based on a need to have in-need populations “invest” in their own development, and be reinvested in growing GBF's efforts, including the expansion of GBF's scope, such as additional projects, or diversified product options (e.g., solar home systems, micro-grids).
- GBF will assume a *strategic* approach to the future direction of the organization. Opportunism will be avoided unless new proposals align with our strategy, goals and guiding principles.

Target Markets

There are specific qualities and criteria that establish a suitable market for GBF. The Global BrightLight Foundation will follow the guiding principles to assist in evaluating potential projects. GBF's target market will assist in this evaluation. The target market will be evaluated by these criteria: critical needs of the population (e.g., unelectrified), extent to which those needs are currently being met, demographics, income to purchase products, geographic location (e.g., high population density), and purchasing decision makers and influences.

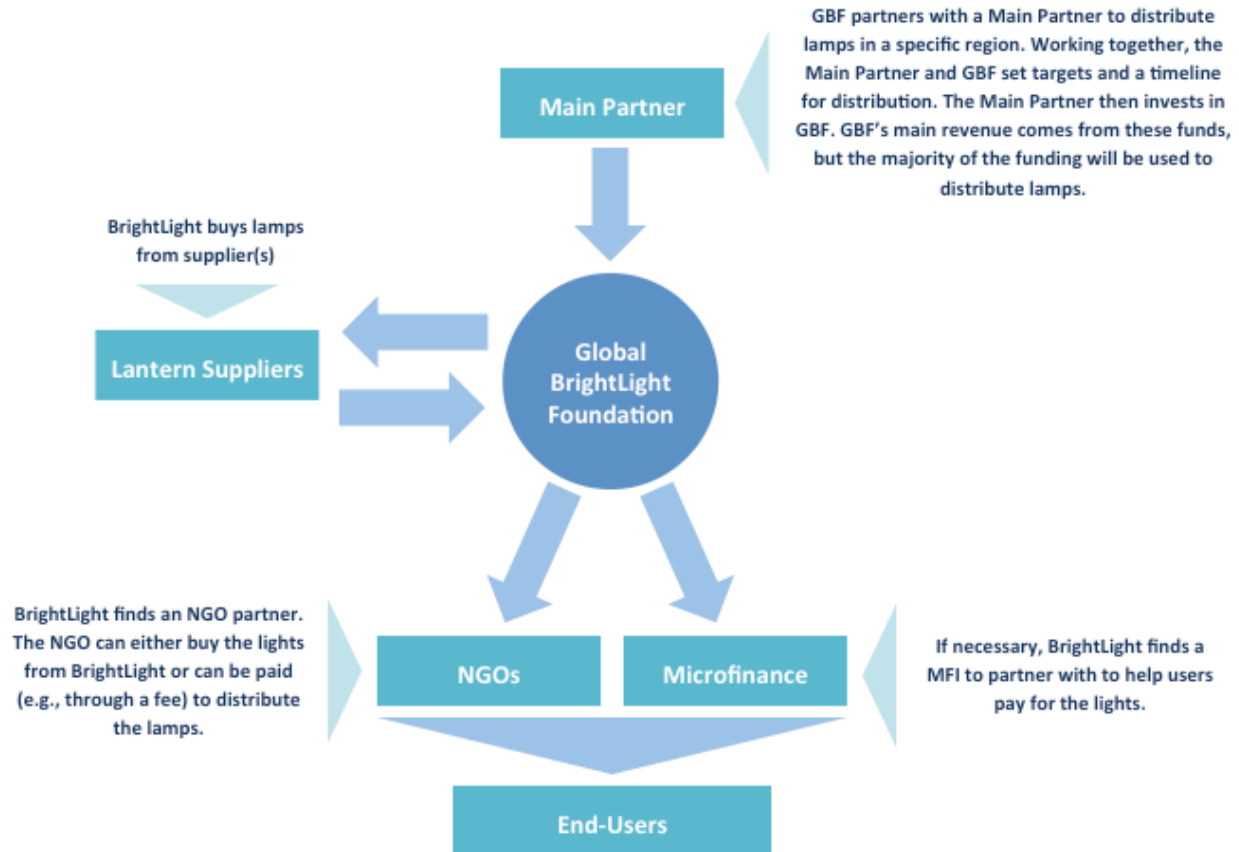
Business Model

The Global BrightLight Foundation’s operational goal is to serve as a market facilitator. Through this role, GBF will enable various players in the solar lantern industry to align their common goals and diverse resources to deliver their products or services to unelectrified populations. Through its relationships with lantern manufacturers, utilities, in-field NGOs, and a wide range of organizations active in this market, GBF connects lantern suppliers to buyers in new markets.

To achieve this goal, GBF partners with organizations interested in and willing to fund efforts to provide rural or peri-urban populations with access to electricity. These organizations can take many forms including, but not limited to, utilities, development organizations, government entities, or other non-profits. For the purposes of this plan, we will call these partners “Main Partner” (see Figure 1). GBF and the Main Partner set targets and a timeline for distribution, decide organizational roles, and together vet other partnering organizations. The Main Partner will then fund GBF and may play an operational role, depending on the core skills and assets of the organization. GBF purchases solar lights from a lantern manufacturer. GBF then contracts with NGOs or other organizations to distribute the lights. NGOs will generally be responsible for distribution, local education and maintenance, marketing, sale of the lanterns, and post-sales product servicing. Where necessary, GBF may partner with multiple NGOs to reach the target market (for example, GBF’s distribution plan may require multiple NGOs to deliver the product to market). GBF will also partner with microfinance institutions to serve populations that require financing solutions. In short, GBF will create markets by establishing partnerships where markets for electrifying rural populations either do not exist or have previously failed.

GBF will recapture some of its costs in one or more of the following ways: sale of the lanterns to NGOs, direct sales to end-users, and/or service fees paid by utility or other funding partners. As a non-profit, all proceeds will be reinvested back into the organization (for further information on GBF’s finances see Finances Section).

Figure 23 Proposed GBF Business Model



Partnering with an overarching main partner to set a project's goals is both a practical and a strategic choice. GBF offers partnering organizations the opportunity to build a new market and gain knowledge that they can apply to other efforts. In return, partnering organizations offer GBF connections to local communities, the potential manpower in the form of locally-based employees, and – perhaps most importantly for GBF's future – a stable funding source. From a strategic perspective, some main partners are important partners because of GBF's growth potential plans. Take utilities for example. Utilities around the world are exploring microgrids as a way to remake their grids, as well as serve unelectrified markets. GBF's experience with rural electrification coupled with its utility relationships make for a competitive and winning combination.

The underlying philosophy of this model is the flexibility to create a market based on the existing resources available to reach a target population. In essence, GBF will serve as the connective tissue in the value chain (see illustration below) where we will connect organizations to fulfill each role along the chain. GBF will likely not play a direct role on the value chain. Rather GBF will recruit organizations and connect them to each other in order to fulfill various roles. What role each organization plays will depend on what resources are currently available on the ground. The only exception to this rule is the role of designing

new products. We expect to be aggregate customer feedback and work with a manufacturer to develop new and improved products.



Figure 24 GBF's Role in the Value Chain

GBF's model offers value to each industry player in the market:

- For main partnering organizations, GBF offers an affordable and efficient way to provide energy services to populations that the organization would like to reach.
- For lantern manufacturers, GBF will buy and distribute products to customers the manufacturers have yet to serve or develop a market that is currently not reached by their organization, creating potential for growth in solar products and alternative electrification approaches (i.e., micro-grids).
- For microfinance institutions, GBF will provide new customers in a new and growing market for small loans to unelectrified populations.
- For NGOs, GBF offers the opportunity to serve existing markets with new products or new markets altogether as well as creating the potential for additional revenue streams.
- For end-users, GBF will provide the value of safe, clean, and affordable light for reading, working, and cell phone charging, as well as, reducing the need for costly and dangerous sources of energy.

Product

For people living in remote areas in Africa, Asia and Latin America (areas with the greatest levels of unelectrified populations), decentralized solar technologies provides a sustainable and efficient energy source. Although there is no single 'magic bullet' solution to the problem of energy access, and investment in a wide range of clean energy solutions will be needed, solar PV is a particularly attractive technology for off-grid markets for a number of reasons:

Easy maintenance – Solar PV systems, such as lanterns or panels, have no moving parts and, as such, are easy to maintain. With the longevity to last several years depending on levels of wear and tear, it generates daily enough light to illuminate a home or charge a mobile phone for several hours.

Minimal operating costs - The lack of a physical feedstock (e.g., kerosene) eliminates logistical issues around fuel management, recurring costs to maintain energy availability, and further operating costs once the unit has been purchased

Modularity - Solar PV units are modular and can be easily built up from 2.5W to 200W+ panels as household income increases. Market penetration can therefore begin with the simplest appliances – small solar lanterns and their chargers – and then be built over time

as customer acceptance and income increase. Modularity can also support growth of solar systems large enough to power economic activities to revitalize the village economy.

Strong and growing demand - Solar PV technology dovetails perfectly with two other technological revolutions that are taking place in developing countries, namely ultra-efficient LEDs for lighting that are far superior to all alternatives and require minimal power, and mobile telephony which is becoming prevalent even in remote rural areas. The combination of these two transformational technologies for the poor means that there are compelling reasons for even the lowest income households to demand and be willing to pay for small solar PV systems. Solar PV is also the ideal technology for charging mobile phones in remote rural areas with no grid access. No other energy technology, whether renewable or otherwise, offers this convenience at this scale.

Cost - Solar PV technology, as with any emerging technology, will experience a continuing decline in price over the years. Although the trend is not always uniform, the expectations of a decrease in prices over time allow for economies of scale to be gained and greater affordability offered to the unelectrified.

Based on this understanding of the opportunity solar PV lighting products present, GBF will use these products to achieve its mission. GBF will start with small-scale products (e.g., lanterns), so as to allow these products to be usable by individuals in their own contexts, strive for reliability to reduce need for significant maintenance, and high enough quality to provide an intensity of light / energy adequate to support reading, other learning, communal gatherings and charging of small scale communication devices.

Through two pilots in Patagonia and Rwanda, different manufacturer products and models were deployed to not only understand how they address needs, but also the performance of these solar PV projects in the field. The Foundation has utilized Barefoot Power (hereinafter referred to as “Barefoot,” <http://www.barefootpower.com>) and GreenLight Planet (hereinafter referred to as “GLP,” <http://www.greenlightplanet.com>) as product suppliers to date. Based on our field pilots, we believe these sources currently offer the optimal product solutions for the sub-commercial populations we seek to help.

Barefoot Power

Barefoot Power’s products provide clean, low cost micro-solar lighting and phone charging products. Barefoot is one of the earliest developers of affordable PV lighting solutions for the developing world. The company operates in over 40 countries worldwide, has deployed over 100,000 units successfully to date, and currently ships to approximately 10,000 households per month globally.

Barefoot designs its products to be affordable, reliable and versatile. The company has an extensive product line. Its products provide performance, room lighting, and value. The company produces systems ranging in size from small solar lanterns to a 15 W, multiple-unit lighting and charging solar PV system. All its products come with a warranty. Barefoot has also expressed its willingness to work with GBF to customize its products to meet the needs of the communities served by the Foundation’s pilots.

Greenlight Planet

Greenlight Planet (GLP) offers small-scale solar development solutions for the public sector and non-profit organizations to deploy in unelectrified regions, providing energy everyone can afford. GLP's offerings are ideally suited for assisting rural unelectrified as its small-scale solar products are built intentionally for village-level use, offer long hours of usage, a multi-year battery life, performance warranty, and construction adequate to withstand moisture and dirt. Additionally, GLP has experience with in-country distribution and the adaptable networks to build channels into rural markets.

The price of products deployed will differ, based on the model, order size, cost of shipping, import duties, taxes, and fees, and mark-ups throughout the supply chain. As such, it is recognized that price per product will differ based on the location and business environment and thus will potentially result in customized pricing and financial models for each project location. For further details on how pricing will be approached, refer to the "Finance" discussion of the business plan.

In addition to deployment of products in project locations, GBF will also continuously evaluate the landscape of small-scale Solar PV products that exist in order to ensure that we are delivery the most affordable, high quality products to the communities that are served. This ongoing research and evaluation of products will be facilitated through our current management team's expertise, but also in partnership with Duke Energy and future potential collaborations such as the IFC's Lighting Africa product evaluation and certification efforts.

Key Considerations when evaluating products will include:

- **Quality and Reliability:** Durability and workmanship of products are important to ensure a resilient product in rural field settings. Products must be able to withstand various environmental factors and regular to extensive use.
- **Performance:** Product performance, an important characteristic to help "sell" the value of solar PV products over traditional energy / light sources, includes characteristics like light output and quality, lighting duration, performance of charging and energy storage sub-systems. Lower cost systems, as those targeted at the poor and unelectrified, can place limits on the capacity of the unit or system, which may necessitate multiple units to fully address user needs. Limits on performance must be balanced with the cost of the system.
- **Ease of use:** Availability of quality instructions and related information for end-users is important to assist proper operation in the field.
- **Special Features:** Additional features, such as mobile phone charging, could add additional value for the end-user and improve the chances of uptake of the introduced solar PV technology. Multi-use products, through pilots, have been shown to be more favorable among unelectrified populations, particularly due to the initial cost outset required for the system.
- **Affordability:** Since we are targeting some of the poorest individuals in the world, affordable systems are important when considering the initial and operating costs to the end-user. Affordability in regards to cost to GBF is important to minimize the final price impact on price-sensitive consumers in emerging markets.

- **Logistics and Delivery Reliability:** Getting solar lights into the customers' hands requires an innovative and adaptable network. Manufacturers that have experience in rural distribution and, ideally, work closely with our partners to create awareness and deliver products directly into the interior villages where they are needed most, are best suited to help GBF establish our value network.
- **After Sales Support:** Customer confidence is critical. Products deployed to the unelectrified must be coupled with manufacturer that has a genuine commitment to quality, which includes reasonable warranties, and when possible, local warranties.
- **Long-term relationships and potential for collaboration:** Ideal product manufacturers are those that may consider opportunities to participate in the GBF network, seeking opportunities for constructive change. These partners would support GBF's efforts to redesign existing offerings to serve constituents better.

Partners

As noted in prior sections, partners are critical to GBF's model. The partners with which GBF will work fall into four main categories with the accompanying roles:

1. **Main Partners** – These organizations can take many forms including, but not limited to, utilities, development organizations, government entities, or other non-profits. They provide funding, in-kind services, employees, local connections, and/or familiarity with the local social, economic, and political landscape.
2. **Solar lantern manufacturers** – Provide solar lanterns to GBF with the potential to customize a GBF-specific lantern in the future based on GBF's field experience.
3. **Non-governmental organizations (NGOs)** – Distribute, market, sell, and service lanterns. NGOs are critical to this effort as they provide local connections and on-the-ground manpower that are critical to the success of this – or any – model serving unelectrified populations.
4. **Microfinance Institutions (MFIs)** – Provide loans to local entrepreneurs and/or end-users as needed.

When deciding whether to work with a potential partner, GBF will consider the following criteria for each:

Main Partners

- **What prior commitment has the partner expressed for rural electrification?** Many organizations around the world are interested in providing service to unelectrified populations. The more commitment they have expressed prior to partnering with GBF the better.
- **How willing is the partner to sell lanterns to target populations?** If there is one metric that will determine the success of serving unelectrified markets, it is whether or not the lanterns were sold to a population. It is critical that the main partner be willing to sell the lanterns to the local population and, in the process, establish a market. We prefer not to partner with partners that view this project in purely philanthropic terms.

- **Is the partner willing to fund a lantern distribution project?** Main partners will provide a main source of funding for GBF and its projects so a critical consideration is whether the main partner is willing to fund a project.
- **How familiar is the partner with the local political, social, economic, and cultural landscape?** In GBF's experience, serving unelectrified populations is fraught with complexity on multiple levels. While GBF will conduct research into each parameter, on-the-ground experience and knowledge in a specific country will be critical to a project's success.
- **To what extent is the main partner interested in a long-term collaboration?** GBF's long-term vision includes partnering with many types partners on a range of electrification projects. It will be important to work with partners that view a partnership with GBF as a long-term relationship rather than a one-off project in the short-term.

Lantern Manufacturers

- **What is the manufacturer's track record? Where are their products currently sold? How long have they been in the market?** This information is key to understand the manufacturer's strength, brand, and market presence. We will use this information to assess whether the manufacturer's geographic presence helps our mission, to ascertain which of their partners we can partner with for our mission, and to evaluate how their distribution channels can be used for our projects.
- **What price will the manufacturer charge for bulk purchases?** GBF's financial model requires that the cost to deliver a lantern be as low as possible. Thus, a good lantern supplier must be willing to lower the cost per unit for bulk purchases.
- **How responsive has the manufacturer been to GBF's requests and communications?** In GBF's experience, an important sign of a company's ability to conduct business is its responsiveness to customers.
- **Are they willing and do they have the ability to customize their lantern for GBF?** GBF's on-the-ground experience suggests that the populations it serves may require additional or refined services from its solar lantern. These needs will emerge as additional projects are undertaken and the needs and use cases for lanterns among the unelectrified become clearer. To achieve this, GBF may require a lantern manufacturer to customize its lantern.
- **How do the manufacturer's products perform in GBF's target geographies?** Not every product will work in every environment. GBF's technology team will test products to ensure they can withstand the environmental factors of a given geography and that they effectively meet the needs of our target populations. In addition, GBF will consult Lighting Africa's quality assurance program to ensure that GBF uses the best product possible.
- **From where does the manufacturer ship?** Understanding a manufacturer's logistical challenges and benefits has been critical in GBF's pilots. When possible, we will work with manufacturer's whose logistical situation helps more than hurts our mission.

NGOs

- **How much experience does the NGO have in serving unelectrified populations?** Ideal NGO partners will have had experience serving rural or peri-urban unelectrified populations.
- **How much experience does the NGO have in selling products to BoP populations?** As noted above, it is critical to the success of this effort that the lanterns be sold to target populations. It is not a requirement that NGOs focus specifically on providing energy products. GBF will look for NGOs partners for which providing lighting and other energy products will be a benefit. For example, education NGOs will benefit from our mission because their populations will be able to study more using solar lanterns. To the extent possible, GBF will look for and exploit these synergies.
- **How familiar is the NGO with the local political, social, economic, and cultural landscape?** In GBF's experience, serving unelectrified populations is fraught with complexity on multiple levels. A project's success will rely heavily on an NGOs on-the-ground presence, the relationships they have built, and the knowledge they have of cultural, social, political, and economic norms. While GBF will conduct research into each parameter, on-the-ground experience and knowledge in a specific country will be critical to a project's success.
- **What price will the NGO charge to partner with GBF?** GBF's financial model requires that the cost to deliver a lantern be as low as possible. Thus, a good NGO partner will provide low-cost services. For this reason, where possible, we recommended prioritizing partnerships with NGOs that are based in the home country because typically their overhead costs will be lower compared to NGOs based in the U.S.
- **How committed is the local NGO to improve economic development, health, education, or safety of the local populations?** GBF desires to work with NGOs whose mission it is to improve the economic development, health, education, and/or safety of the local population. Solar lanterns can affect each of these specific areas of interest and, from our experience in Rwanda and Argentina, the more our missions align, the better the service that is provided.

MFIs

- **What experience does the MFI have servicing loans for rural electrification?** This criterion measures the extent to which an MFI partner has had previous experience servicing loans specifically targeted to rural electrification. While these types of loans are relatively new in the market, an ideal partner will have had some experience in this area or a clear vision of how to provide appropriate financing to the unelectrified.
- **What experience does the MFI have servicing loans for BoP populations in the target region?** An ideal MFI partner will have an extensive portfolio in a specific region, which will provide familiarity with local customs, needs, and ability to pay. While GBF will likely forge into markets that have yet to be tried by MFIs, it will be important to understand the MFIs prior experience in the field.

- **What is the cost of financing to the end-user?** In order to effectively serve this market, the all-in lantern cost must fit the financial profile of the end user, including a low cost of capital for the consumer to borrow funds. An ideal partner will have clear servicing costs and few hidden fees that increase the cost of capital.

To ensure the utmost flexibility, the criteria outlined above will serve more as guidelines than hard-and-fast rules. There will likely be times when partners won't fit the "ideal" model, which will force GBF to take risks with partners that are new to a given role or market. This is a primary value of GBF's model: GBF can take risks to build and expand markets that the private sector might be unwilling to take. This 'patient capital' approach is essential to building markets at the base of pyramid.

Operations

Distribution Capabilities

The distribution of lanterns to end-users is possibly the most challenging aspect of GBF's operations. To distribute lanterns within cost and at scale, GBF must be able to call on the fundamental capabilities of distribution, either independently or through its partners (Shukla, 2011). GBF will evaluate its ability and that of its partners to provide these capabilities prior to launching activities in a new area to prevent overextending funds. The six capabilities and their underlying requirements for success are described in Table 6.

Table 6 The Six Capabilities of Successful BoP Lantern Distribution

Capability	Requirements of Success
<i>1. Contact</i>	<ul style="list-style-type: none"> • Physical presence with end users in their local areas • Access to local intermediaries and leaders who understand "pathways to influence" end users
<i>2. Information</i>	<ul style="list-style-type: none"> • Data gathering and analysis on users habits, demographics, and lifestyles to gather insights that inform choices on marketing and distribution business models
<i>3. Physical Distribution</i>	<ul style="list-style-type: none"> • Transportation resources (trucks) and infrastructure (roads, fueling stations) • Accessible storage during transit • Inventory control to maintain consistent supply • Protective packaging • Instructional manuals and available warranty
<i>4. Promotion</i>	<ul style="list-style-type: none"> • Powerful messaging about the lanterns that is clear, understandable, and inspires action among end users • Access to communication platforms, i.e. social, local, or mass media

Capability	Requirements of Success
5. Credit and Financing	<ul style="list-style-type: none"> • Credit products and services that allow end users to match their ability to pay with the lantern’s pricing • Financing of partner activities sufficient to cover their own working capital needs
6. Post Sales Service	<ul style="list-style-type: none"> • Ability to fulfill lantern repair needs, even in potentially remote areas • Ability to map product repair cycles and predict parts inventory needed (Shukla, 2011)

To achieve these capabilities, GBF will use a *hybrid approach* for distribution by combining multiple business models and partners across its operations worldwide.

The hybrid approach is the best distribution method for GBF two reasons: 1) No single partner – NGO, governmental, or profit – will have the qualifications to achieve all six capabilities described above. For example, GBF will utilize NGOs for their “grassroots reach” to BoP users and microfinance institutions (MFIs) for their credit and financing activities (Shukla, 2011). 2) Each BoP region requires a distinct distribution method. Because GBF has always strived for a global reach, it must employ a multitude of distribution methods customized to each place and shaped by in-field partners. The hybrid approach is described in further detail in Table 7.

GBF’s hybrid approach to distribution will involve multiple specialized partners.

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Table 7 Potential Distribution Partners for GBF

Distribution Channel	Description	Capabilities	Pros	Cons
Proprietary	GBF develops path to end consumer organically and executes full distribution process using in-house resources	Confined to GBF’s capabilities	More control, more flexibility, ability to enter niche market	Complex, extremely costly, will require the most time

Distribution Channel	Description	Capabilities	Pros	Cons
NGOs	Local or transnational NGOs whose activities relate to the BoP	Contact, Information, Post Sales Service; some Physical Distribution, some Promotion	Large reach, trust with end-user, potential ability post sales service	Decentralized structures causes protracted decision making, weak distribution logistics, no mass media channels, no financial lending
Cooperatives	A business organization owned and democratically operated by its members. Earnings are allocated based on participation	Contact, Promotion, Credit and Financing, Post Sales Service; some Physical Distribution	Preexisting infrastructure and inventory management, able to promote products, credit support for small groups, generate capital through multiple channels, ability to service	Confined to region and cannot move product long distances
Self-Help Groups	Group of 10-15 micro-entrepreneurs, typically women, who save money individually and contribute to common fund for emergencies	Contact, Promotion	SHG federations have extensive field presence and organizational capabilities, persuasive seller position	Limited experience with logistics, credit not available, too decentralized to fundraise from external sources

Distribution Channel	Description	Capabilities	Pros	Cons
Rural Retail	Includes wholesalers and last-mile retailers (In India: boutique <i>kirana</i> shops, weekly local markets called <i>Haats</i> , and larger, local, temporary markets called <i>Melas</i>)	Contact, Promotion, Physical Distribution	Retailers are well suited to physically distribute product, capable in storage, warehousing, logistics for rural regions, capable of promoting products through radio, print, events	Less sophisticated with financing, usually providing a discount or MFI linkage for one product, not for an entire channel, no post-sale servicing

Customizing Distribution to Location

GBF will rely heavily on partners for local guidance on effective methods of lantern distribution and to carry out these methods. A key tenet of GBF’s approach is that every place with a distinct set of cultural norms, geographic features, and political structures likely requires a distinct method for distribution. Because GBF plans to distribute lanterns around the world, GBF will not strive to become an expert of distribution in a single locale. Instead, GBF must depend on partners to provide the knowledge, expertise, and in-field resources necessary to execute the right distribution plan for a given location.

GBF will rely on partners to help customize the distribution plan to their area’s cultural and geographic needs

Distribution Principles

GBF will maintain a working set of principles on the “Best Practices of Distribution” drawing from initial research and ongoing experience. These principles will help GBF identify and select in-field partners by providing a benchmark to compare partners’ methods with GBF’s best practices for distribution. Whether GBF considers these principles to be unbreakable or negotiable is up to the organization. Below is an initial list of these best practices for GBF or its partners to undertake.

Working List of Best Practices

1. GBF will research and investigate the potential of each new market before launching operations to prevent overextension of funds and avoidable setbacks.
2. GBF will sell, not give away the lanterns, to ensure stewardship among users.
3. GBF will involve local people as village level entrepreneurs (VLEs) to multiply its positive impact.
4. GBF will educate users on proper use and maintenance.

5. GBF will provide microfinancing options and will bundle payments to make repayment easier for end users.
6. GBF will provide post-sales services to end users to extend product life cycle.

Distribution Challenges at the BoP

The complexity of rural BoP markets is a significant factor that may affect GBF's operations. Some of the key challenges of the BoP working environment are listed below (Shukla, 2011).

- **Government intervention:** Tariffs may be cost-prohibitive for GBF's operations in many markets. In addition, government programs have flooded some markets with low-quality products that may have affected customer opinion of solar powered lanterns.
- **Infrastructure constraints:** Underinvestment in roads, water channels, and telecommunications is one of the most fundamental challenges of distribution.
- **Geographical challenges:** Extreme weather conditions and hostile terrain are added difficulties to the distribution challenge.
- **Population density:** Low population density prevents economics of scale in many BoP regions and reduces the cost-effectiveness of lantern distribution.
- **Diverse stakeholders:** The operating characteristics of civil, political, social, and private sector players range dramatically across BoP areas, thereby requiring GBF to cultivate a locally-based strategy in each region.

These challenges are real, but not insurmountable. GBF's hybrid approach to distribution will provide the flexibility needed to adapt to a range of circumstances at the BoP.

Finances

The Global BrightLight Foundation is a non-profit organization that will receive revenue from both fundraising and the sales of solar lanterns. The sales of solar lanterns may not cover the cost of the lanterns. In those cases, they will be subsidized by GBF's fundraising. The financial return from lantern sales will be derived from in-need populations by 'investing' in their own development by paying for some portion of a solar lantern. This return will be reinvested in growing GBF's scope and size of efforts.

Funding and Revenue Streams

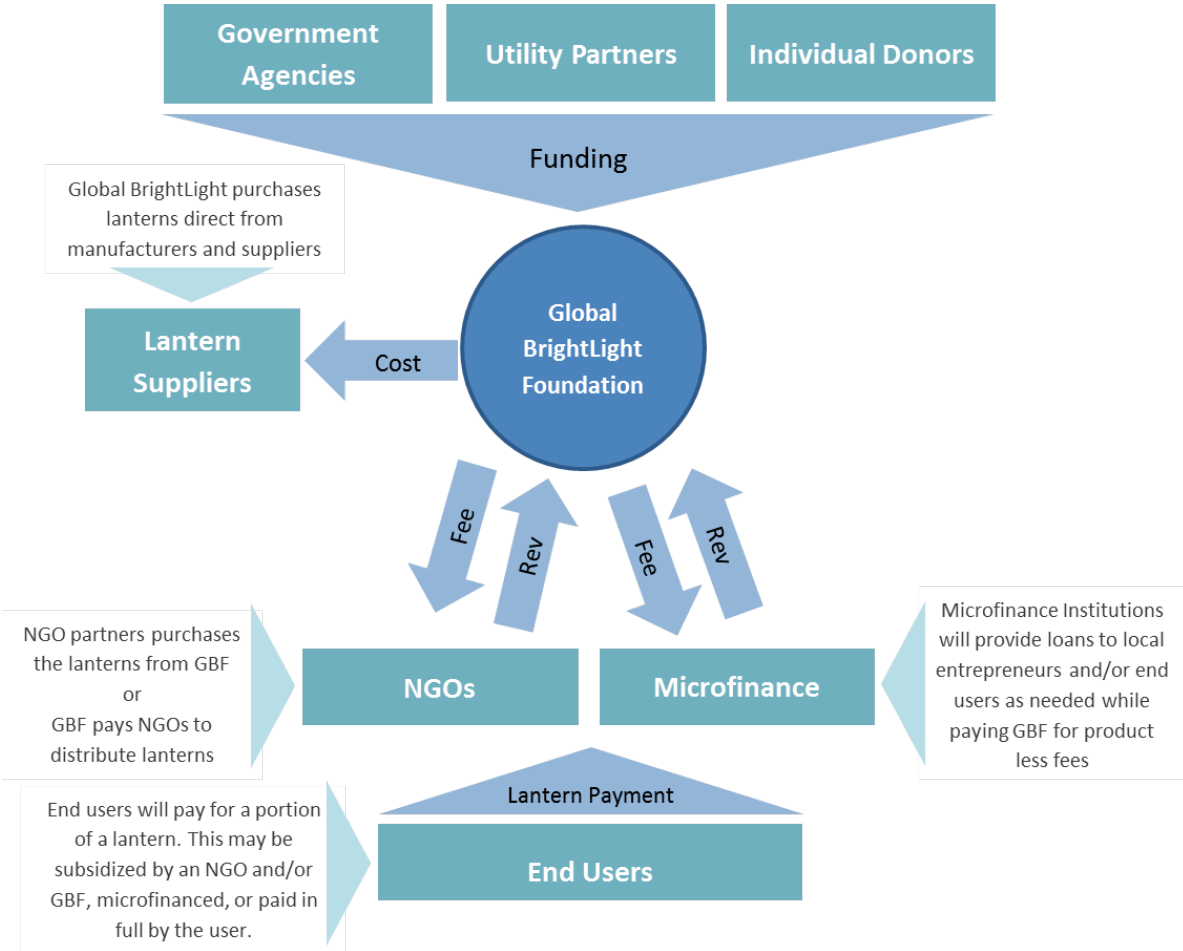
The Global BrightLight Foundation will receive funding from three primary outlets; utility partners, government agencies, and individual donors. Fundraising is one of GBF's strengths by utilizing the connections and abilities of GBF's current board members and staff. GBF will also receive revenue and fees from NGOs and Microfinance Institutions (MFI's) from delivering and paying for solar lanterns. End users will pay some cost for solar lanterns, which will help fund the NGO's and MFI's fees to GBF.

Cost and Fee Streams

The Global BrightLight Foundation will have one primary cost of solar lanterns. There will be additional fees paid to NGOs to distribute solar lanterns and MFI's to assist end users

with loans to pay for solar lanterns. Other costs would be incurred related to the distribution of the solar lanterns including; export and import tariffs, taxes, and transportation of product. As GBF continues to grow, they will hire paid staff as mentioned in the *Management & Organization* section.

Figure 25 GBF's Revenue and Cost Model



Provisions of Product

Through first-hand experience and second-hand research, GBF has found that requiring end-users to pay for at least a portion of the cost of the lantern is important to not only fuelling development, but also building a market around small scale power solutions. As such, GBF will move past purely charitable distribution of product and will require end users to pay some cost to use and/or purchase a solar lantern or similar product. Through GBF’s pilots, the organization has seen that end users do not value what they receive for free. Placing a price on a product for the end user to pay puts some inherent value on the product in the end user’s perspective. This value leads to longer lasting products, more effective use of a product, and economic improvements from the benefits of light and cell phone charging to those without access. Other organizations indisputably say solar lantern distributors need to charge the end user. When organizations give away free lanterns users

do not receive all the benefits from them and these actions become detrimental to the solar lantern market.

Pricing

Lantern pricing, NGO fees, and MFI fees will be specific to each GBF project. Pricing lanterns will be variable due to varying costs to distribute a lamp in different countries. The greatest variability exists due to differences in export and import tariffs (i.e. 11% from China), taxes of the lantern manufacturing and destination country. Additionally, if different products are used, their prices will vary.

Solar lanterns with cell phone chargers are about \$15-\$50 in U.S. dollars. Most end users cannot afford \$15-\$50 upfront for the product. However, depending on the nature of the location, partners, end user's income, and the cost of lantern distribution for a particular project, there are several approaches GBF will take:

- 1) Energy Acquisition - End user pays for product up front = Immediate user ownership
- 2) Energy Financed - Partner with a microfinance organization = User retains ownership when 100% of lantern is paid off
- 3) Energy Subsidy - GBF and partners subsidize product = Immediate user ownership begins when 100% of payment required is received
- 4) Energy Rentals – Same price as the daily kerosene cost (\$0.08/day) = User never retains ownership of the solar lantern

The Global BrightLight Foundation will also evaluate each NGO and MFI partnership individually and price accordingly. NGO fees will depend on their job duties on a project. At times NGOs will purchase lanterns from GBF and at other times NGOs may charge GBF distribution fees. MFIs will have similar variability because of these differences in lantern purchasing and their capacity to serve end-users. They also may work directly with GBF or may work directly with NGOs.

Use of Funds

Currently GBF uses the funds it has received to purchase and distribute solar lanterns. However, as GBF continues to become a market facilitator these costs are anticipated to evolve into fees paid to NGOs. In this case, the NGOs will assume more of the cost of the solar lanterns and distribution (associated with greater maturity in a market where these NGO partners recognize the opportunity to gain revenue themselves from the sale of the lanterns). Furthermore, as GBF continues to grow, funding will be strategically invested in dedicated staff necessary to convene market players and to distribute light and power to those without access to electricity, and allow GBF to gain scale.

Organization and Management

GBF is established as a 501c3 organization, appropriately structured to be an “outcomes-oriented” organization. The structure of a 501c3 was chosen to reap the benefits of offering potential tax deductions for donors and the ability to dedicate a pure focus on the mission without having to consider shareholder returns.

Founded by four leading active and retired executives, together, GBF's founders bring over 100 years of experience working in industry and non-profit settings in various capacities. Details on the founders and board members of the organization can be found in table 8.

Table 8 Co-Founders and Board Members

Name / Role	Experience
<p>James E. Rodgers Co-Founder, Global BrightLight Foundation, Chairman, President and CEO, Duke Energy</p>	<p>With 23 years' experience in the utility industry, Jim Rogers currently serves as chairman, president and CEO of Duke Energy. Under his leadership, Duke Energy has been recognized as a leader in sustainability - balancing the "triple bottom line" of people, planet and profits. In 2010 and 2011, the company was named to the elite Dow Jones Sustainability World Index; it has been a part of the Dow Jones Sustainability Index for North America for the past six years.</p> <p>Jim has served in numerous roles in business, advocacy and environmental policy, including as deputy general counsel for the Federal Energy Regulatory Commission, vice chairman of the World Business Council for Sustainable Development, founding chairman of the Institute for Electric Efficiency, and board member of Duke University's Nicholas Institute for Environmental Policy Solutions.</p>
<p>Joe Hale Co-Founder, Global BrightLight Foundation</p>	<p>Prior to Duke Energy's merger with Cinergy Corp., Joe was President of The Cinergy Foundation, Chief Communications Officer for the company, and also served as President of The Cincinnati Gas and Electric Company. Before joining Cinergy, Joe was President of The Kasler Group, an architectural firm based in Indianapolis. He has served on numerous boards and has chaired fundraising campaigns that have raised over \$100 million for non-profit organizations. An avid runner, Joe raised over \$250,000 for the March of Dimes in 2005 by running seven marathons on seven continents in seven months. Joe is married to Linda Hale and they have three children.</p>
<p>R. Kerry Clark Retired Chairman and CEO, Cardinal Health</p>	<p>R. Kerry Clark is a Retired Chairman and Chief Executive Officer of Cardinal Health, a Fortune 20 company. Prior to joining Cardinal Health, he spent 32 years with the Procter and Gamble Company. Kerry is currently a director of Avnet, General Mills, Textron and Bausch+Lomb Inc.</p> <p>Under Kerry's leadership, Cardinal Health expanded its opportunity to help hospitals, pharmacies and clinicians make the practice and delivery of healthcare safer and more productive.</p> <p>Kerry currently serves on the boards of the Christ Hospital of Cincinnati, the Elizabeth Gamble Deaconess Home Association and the Cincinnati Zoo Foundation. He is also a member of the Dean's Advisory Council for The Ohio State University's Fisher College of</p>

	Business and a founding director of the Global BrightLight Foundation.
David Shane CEO, LDI Ltd., LLC	<p>David Shane is the Chief Executive Officer of LDI Ltd., LLC, an international distribution and logistics company based in Indianapolis, Indiana. Before joining LDI, David was a partner in the Indianapolis office of law firm Faegre Baker Daniels, with a practice centered in employment, education and work force issues.</p> <p>David has worked for more than two decades to improve educational opportunities for youth and adults in Indiana and across the United States. He and his wife Anne have a long history of community service, including work with the AMPATH medical and community health efforts in Kenya, and its support from the Center for Global Health at the Indiana University School of Medicine. Anne and David have a daughter who is a physician in Chicago and a son who is a business executive in Toronto.</p>

NOTE: The board is currently undergoing a search for additional board members that bring certain complementary skills to the group to support the development of GBF. Ideally suited future board members would bring with them strengths in marketing/new media and finance, and bring additional diversity to the team.

Strategic direction of the organization is driven and approved by the GBF board, in addition to key members of the Management Team, specifically those engaged in key partnership projects (e.g., GSEP).

Board Responsibilities

1. Setting the direction of the organization
 - a. Creating or updating the mission and vision of the organization.
 - b. Overseeing development of goals and objectives of the organization, including providing input on any projects that may include novel programs and services not previously undertaken by GBF.
 - c. Approving the strategic plan.
2. Monitoring the organization’s operations
 - a. Hiring and periodically evaluating the organization’s executive director.
 - b. Working with and providing support to the executive and team.
 - c. Approving the annual budget, annual report, etc.
 - d. Approving major contracts and grants.
 - e. Soliciting and reviewing program evaluations.
 - f. Troubleshooting as necessary.
3. Fundraising and Outreach
 - o Fundraising, by directly donating to the non-profit and soliciting donations from others.
 - o Advocating for the organization.
 - o Connecting the organization to potential GBF partners.

The management team is responsible for day to day operations, namely the execution of operations in line with the previously outlined business model. In order to equip the organization for realizing its goals, the following roles are or will be held as the organization grows:

Table 9 GBF Roles – Current and Future

Title	Name	Role Description
Executive Director <i>Full Time</i>	Joe Hale	<ul style="list-style-type: none"> • Lead, coordinates, supports and manages the work of GBF and represents GBF on the international level. • Implement the decisions of the Board, including the coordination of the GBF’s strategic direction for approval and implementation. • Oversee efforts of the management team, together with its partners, to carry out the organization’s mission. • Lead strategic planning and priority setting. • Ensure fiscal soundness and financial management. • Lead fund development and fundraising with support from the Board. • Develop relationships and establishes positive working interactions with people at all levels. • Devise marketing strategy and executes promotion activities with support of Outreach / Marketing coordinator. • Ensure the regional projects / programs are successfully meeting their mandates.
Director of Strategic Partnerships <i>Part Time</i>	John Stowell	<ul style="list-style-type: none"> • Serve as primary liaison for current and potential utility relationships. • Explore opportunities to partner with utilities and larger electrification related organization (e.g., GSEP). • Understand and communicate potential growth options to serve as facilitator for future commercial opportunities and market development for the base of the pyramid (e.g., micro-grids).

Title	Name	Role Description
Director, Operations and Logistics <i>Full Time</i>	TBD (Potentially outsourced)	<ul style="list-style-type: none"> • Assist the Executive Director in implementing regional strategic plans, specifically focused on creating the appropriate distribution model for lanterns from manufacturer to local partner (e.g., NGO). • Maintain communications with all relevant partners and stakeholders to ensure expedient and cost-effective product distribution. • Ensure that all materials necessary for the value network to function are made available to the parties that need them (e.g., NGOs), a task accomplished by coordinating most aspects involving shipping. • Work with relevant parties to develop a plan for what goods need to be shipped when and where; ensure that all parties, including shippers, transporters, and receivers, are clear on their duties, such as when and who is to receive shipments and satisfy needs. • Involved in all aspects of the field logistics ensuring that they are implemented in accordance with the organizations policy and fully support operations in the field.
Financial Coordinator <i>Part Time</i>	TBD	<ul style="list-style-type: none"> • Under the direction of the Executive Director, maintains or directs the maintenance of all necessary and appropriate records, files and processes to ensure the smooth and compliant financial operation of the organization, focusing on accuracy and transparency.
Technical Coordinator <i>Part Time</i>	Zachary Kuznar	<ul style="list-style-type: none"> • Ensure product offerings are selected and appropriate designed to optimally serve needs of the end-user in the context of the according project location. • Oversee the continuous evaluation of products and identification of areas of improvement in product design. • Work with partner manufacturers to design technology appropriate to GBF needs.
Outreach / Marketing Coordinator <i>Part Time</i>	TBD (Potentially outsourced)	<ul style="list-style-type: none"> • Assist with fundraising and marketing/communication projects, such as: grant proposal development, social media updates, and development of promotional material.

Title	Name	Role Description
GBF Advisors <i>Part Time</i>	Alanya Schofield; Rye Barcott; Michael Rowland; Bill Tyndall	<ul style="list-style-type: none"> Provide input to activities of the organization, as appropriate. <p>NOTE: These roles will typically be filled by personnel from large funders who will participate in strategic discussions and engage around key concerns / developments to ensure successful delivery against expectations of the funders.</p>

The combination of the currently occupied board and management roles bring the following strong capabilities to the organization to enable it to succeed in fulfilling GBF’s strategy. These capabilities will not only support execution, but the strategy and business model itself has been designed to quickly leverage these strengths to expedite achievement of GBF’s strategic goals. Key capabilities of the organization and the team include:

Marketing: Members of the board have experience with marketing programs within developed markets. This adds value to GBF’s ability to raise awareness in modern economies, build a customer base in target countries, and lend experience to the creative process of entering new markets that don’t have the marketing channels found in developed nations. This marketing capability, in developed markets, can serve to increase sources of funding from individual donors and corporations may provide a stronger competitive advantage. Few organizations in this space have waged marketing campaigns in developed countries to gain scale, including engaging with influential and resourceful utilities (key partners), or to present opportunities with organizations surrounding not only philanthropic but potential commercial opportunities through developing a market for power for the unelectrified.

Product testing: GBF has access to resources that offer capability to test, benchmark, and compare existing products. This will support the continuous evaluation of products to ensure the highest standard of products for the markets served, as well as expose opportunities for product improvement.

Fundraising: Most board members have experience managing significant fundraising campaigns from both large grant-making organizations and individual donors, in addition to experience dealing with funding from and philanthropic arms of utilities and other large companies / organizations. This will assist GBL’s fundraising ability in developed markets and, in the process, raise awareness about the organization’s efforts. Many organizations in this space lack sustainable funding sources. This gives GBF a competitive advantage because it will help fuel the beginning stages of the organization’s growth, both from the standpoint of funding as well as existing relationships. Relationships for potential funding include (but are not limited to):

- Duke Energy
- Global Sustainable Electrification Partnership (GSEP)
- UN Foundation
- USAID

- Edison Electric Institute Foundation
- World Bank & IFC's Lighting Africa Initiative
- Individual donors

Ability to convene stakeholders: GBF's connections with Duke Energy and GSEP give the organization the clout necessary to pull together various companies, NGOs, utilities, and governmental players. This allows the organization to create connections that might not otherwise have existed.

Access to utility resources (e.g., funding, energy expertise, and technical & political landscape): GBF is uniquely situated with connections to the largest utilities in the world. This capability sets GBF apart from its competitors and offers up a key differentiator when building a sustainable and evolving business model, value network and market for serving those who currently lack access to electricity. These connections provide the potential for access to capital, technical expertise, and utility assets, as well as understanding of energy landscapes around the world. Utilities are currently ill-equipped to approach the problem of rural electrification from a grassroots perspective, but GBF plays the role of facilitator to help serve the needs of the base of the pyramid.

Potential Growth Opportunities

Potential Growth Opportunity #1: Solar Home Systems

Based on discussions with other market players, as well as a survey of existing research, we have found that some customers are able to increase their income and productive use sufficiently enough to require additional energy resources. While GBF will focus its efforts in the short-term on selling solar lanterns, we will also monitor our customers to understand where, if possible, there is an opportunity to increase their energy consumption. In these cases, customers may be ready to graduate up the "energy escalator," as some have called it, to own a Solar Home System (SHS). If a critical mass of our customers reach the necessary income level and energy needs, then we will consider expanding our product offering into SHSs and working with the relevant organizations to provide these systems. To achieve scale, we would follow the following approach:

- **Phase 1 – Monitor Lantern Customers:** The first phase involves monitoring our customers to see if they reach a certain income level and energy needs.
- **Phase 2 – Pilot Concepts & Study New Markets:** The second phase will involve GBF piloting SHS projects with one or more utility partners we have worked with to deliver solar lanterns. GBF will also study new markets to deploy SHS to better understand market dynamics, challenges, and opportunities.
- **Phase 3 – Scale Up:** If our pilots achieve success, GBF will scale up its SHS offering to current customers and new customers we have identified in Phase 3.

Potential Growth Opportunity #2: Micro-Grids

The past decade has seen a large increase in rural electrification efforts around the globe. This interest is fueled by a number of converging macro trends: declining technology costs

of renewable energy, batteries, and efficient lighting, rising costs for fossil and cooking fuels, recognition by the development community that access to electricity underpins each of the Millennium Development goals, an increasing number of social enterprises that attempt to solve social problems through market mechanisms, and the growth in impact investment funds that invest in socially responsible enterprises. The market, however, is still exploring the many ways to serve unelectrified markets. As the IFC's 2012 report "From Gap to Opportunity" highlights, different segments of the unelectrified population require different energy solutions based on a number of factors, such as income, geography, and work potential among others. The poorest of the poor, for example, may only be able to afford a solar lantern, while those in higher brackets would likely benefit from a solar home system.

In recent years, off-grid renewable energy micro-grids have become an important part of the energy access equation. Micro-grids offer end users a mini-utility experience with longer access to light than from lanterns and the potential to increase their adoption of time saving, safe, and efficient appliances. Micro-grids also offer the potential to rapidly increase the number of people with access to energy. In addition to the macro trends described above, micro-grids have gained traction due to the high cost for utilities to extend their grids, as well as, the economies of scale and lower cost of energy that a micro-grid offers over lanterns or solar home systems. Countries around the world have begun to explore ways to support micro-grid development. The Government of India, for example, is currently considering multiple proposals to foster micro-grid development including everything from Power Purchase Agreements and Feed-in Tariffs to capital subsidies intended to entice larger more established players into the market.

Despite this growth, however, the micro-grid market is still nascent. Market players are still working through a number of business model attributes including everything from pricing models (time based or usage?) to grid type (AC or DC?) to ownership models (outright ownership or sale to a local entrepreneur?) to collection systems (in person or prepaid meters?) to anti-tampering tactics (technological sticks or social carrots?). Moreover, government support may stagnate the market in the short-term until proposed policies are enacted and their full implications are known. This will likely take some time.

In addition to serving the solar lantern market, and potentially the solar home system market, over the next 12 to 18 months, GBF will also explore the micro-grid market in a three-phased approach:

- **Phase 1 – Understand the Market:** The first phase will involve exploring the market by talking with current market players, visiting micro-grid installations, researching current market trends, and examining various technology solutions.
- **Phase 2 – Pilot Concepts:** The second phase will involve GBF piloting micro-grid projects with one or more utility partners we have worked with to deliver solar lanterns.
- **Phase 3 – Scale Up:** Based on the findings of these pilots, GBF will then begin phase three by scaling our micro-grid efforts with current and future utility partners.

Micro-grids will require a new operational model and will be far more capital intensive than solar lanterns.

This three-phased approach will allow GBF to understand the various market requirements, operational considerations, necessary partnerships, funding requirements, and micro-grid economics while simultaneously building our brand in the solar lantern market and, potentially, the solar home system market as well. By 2020, GBF will be the leader among non-profits providing access to energy for rural populations.

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