



Business Plan

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1.0 EXECUTIVE SUMMARY

Green Power seeks to provide residents of underdeveloped countries clean, renewable and free sources of energy as well as devices to increase standards of living for the poorest of the poor. Green Power was formed as a result of a senior design project at the Rochester Institute of Technology (RIT). Dr. Robert Stevens, a mechanical engineering professor at RIT, saw the need for a high efficiency, sustainable, and stand-alone lighting system for the people of Haiti. After obtaining two grants from the Environmental Protection Agency and building prototypes of a bike-powered LED lighting system, students and faculty at RIT decided to form a company around the products they developed. Green Power was the result of these efforts.

Fossil fuels are currently the primary source of energy in most underdeveloped countries. Most citizens have very crude products to meet basic needs and often go without such basic needs as light, clean water and sanitation. Green Power will fill this need by designing, manufacturing and distributing sustainable power systems and products that increase living standards for underdeveloped nations.

An initial target market will be established in Haiti due to prior connections within the country, proximity to the U.S. and a large market potential. Haiti has the lowest per capita income of any country in the western hemisphere. Plagued by disease, malnutrition, illiteracy, political upheaval, and deforestation, more than three quarters of the population live in extreme poverty (World Vision). Since less than 25% of Haitians have access to electric power and modern lighting, the market potential in Haiti is about 6,750,000 people (CIA Factbook).

For those who are not on the electric grid, lighting is primarily done by kerosene lamps and homemade candles. Due to the high fuel cost of kerosene as well as the health and safety risks, many Haitians do not have much, if any, space lighting in their homes at night. As a result, most residents go to bed early and cannot read, work or cook after 7pm. The lack of adequate lighting to read at night is a major reason for low education levels in the country (Brownell).

To provide a solution for the lighting problems in underdeveloped nations, Green Power has developed two products: the Green Bike and the Green Light. The Green Bike is a power generation station that is attached to the rear wheel of an ordinary bike. Pedaling the bike creates electricity that can be used to charge a variety of direct current products. The first product charged by the Green Bike will be the Green Light. The Green Light uses a high intensity Light Emitting Diode (LED) to provide space lighting for small areas.

The Green Bike and Green Light offer substantial advantages over the current lighting system in Haiti and other underdeveloped nations. The Green Light is brighter, longer lasting, safer and more cost effective than current kerosene lanterns. The Green Bike offers vendors the opportunity to start their own micro-business by collecting fees to charge Green Lights. Overall, Green Power products keep more money in Haiti and do it in a sustainable way.

Green Power's strategic plan is to become a world leader in human powered products that increase standards of living for impoverished citizens of the world. While Green Power currently is only working on two products, the Green Bike and Green Light, the company will continually develop its brand and diversify its product line.

Green Power currently operates in Rochester, New York. Operations will be moved to Haiti within the next year or two to give the management team direct control of manufacture and distribution of its products as well as to shorten the supply chain. A supporting team of local supervisors, laborers and distributors will be hired once an assembly plant is built in Port-au-Prince, Haiti.

Green Power is predicted to have 20% monthly growth during year one of operation, 10% monthly growth year two and 5% monthly growth year three through year five. Based on predicted expenses, sales revenues and growth rate, Green Power will need \$100,000 in funding in order to become a successful company. This money is likely to come from government grants, angel investors, family and friends.

Government organizations and NGOs will also play a significant role in Green Power's success. The design team has already been in contact with two Rochester-based non-profits interested in the products, H.O.P.E. Haiti and S.O.I.L. These organizations could provide a great initial outlet for Green Power products. Other NGOs are likely to be interested in Green Power and could potentially buy as well as distribute the products in Haiti and other underdeveloped countries.

Based on predicted financial performance, Green Power will breakeven in about 27 months. At the end of five years, Green Power is projected to have sales of \$1.2 million with a net profit of \$1.4 million.

Not only will Green Power benefit from the Green Bike and Green Light, vendors who buy the Green Bike will also benefit by establishing their own charging stations. Vendors will earn money by reselling Green Lights and by collecting a fee for charging the Green Lights. Based on expected financial performance, vendors will make an annual profit of about \$1,283. This is almost twice the average income for people in Haiti.

Green Power will be established as a Limited Liability Company (LLC) with the Chief Executive Officer (CEO), Matt Walter owning 100% of the company. As additional investors and executives are added, ownership will be divided appropriately. Should Green Power fail to succeed as a LLC, the company will reorganize into a non-profit and will partner with existing companies to bring modern lighting technology to underdeveloped nations.

2.0 INDUSTRY, MARKET AND COMPETITIVE ANALYSIS

2.1 Industry Description

Green Power seeks to provide residents of underdeveloped countries clean, renewable and free sources of energy as well as devices to increase their standards of living. Fossil fuels are currently the primary source of energy in most underdeveloped countries. Most citizens have very crude products to meet basic needs and often go without such basic needs as light, clean water and sanitation (Brownell).

Only about 25% of the country of Haiti is electrified. For those who are not on the electric grid, lighting is primarily done by kerosene lamps and homemade candles. Kerosene fuel can cost as much as 50 cents a night, a substantial amount of money considering most Haitians only make about 2 dollars a day. Besides cost, kerosene also has many negative health risks, specifically harmful fumes and the risk of broken glass and fire. Due to these factors, many Haitians do not have much, if any, space lighting in their homes at night. As a result, most residents go to bed early and cannot read, work or cook after 7pm (Brownell).

While remote villages do not have access to the power grid, some well-to-do residents obtain power from solar cells or gasoline generators (Munos). These are very expensive and as such are not common in Haiti. It can be assumed that in remote villages, residents live without electricity and certainly without modern lighting. There is little reason to suspect this will change in the near future. In fact, the Peligre Hydroelectric Dam in Haiti is actually losing power capacity due to reservoir sedimentation caused by over forestation in the area. This will actually lead to lower levels of electrification in Haiti for years to come (G.L.M. Engineering 2). Also, while most major cities are electrified, brownouts are common and power can be off 50% of the time or more in some locations that are considered “electrified” (Brownell).

2.2 Target Market

2.2.1 Demographics

Haiti is the most densely populated nation in the western hemisphere. About half of the population of Haiti relies on government subsidized farming. Some of these farmers own land, but most do not have enough to grow food for their families, let alone earn a sufficient income. Overcrowding and the demand for wood charcoal have led to severe deforestation and soil erosion throughout the country. Haiti has the lowest per capita income of any country in the western hemisphere. Plagued by disease, malnutrition, illiteracy, political upheaval, and deforestation, more than three quarters of the population live in extreme poverty (“World Vision”). A complete demographic breakdown is shown in the Appendix.

The target market for Green Power will be villagers in Haiti that have no access to electric power. Since less than 25% of Haitians have access to electric power and most live in smaller cities, this constitutes about 6,750,000 people (CIA Factbook).

2.2.2 Cultural Considerations

Haitians rely primarily on primitive means of transportation, cooking and space lighting. Most citizens have no experience at all with modern technologies such as cell phones or personal computers. Family units are valued over individuals. Households typically consist of five to eight people and often times consist of three generations under one roof. Families often share time, money and resources freely and often congregate at night in a common room. Since Haiti is a very poor country, theft has become a significant problem (Brownell). Many U.S. churches have missionaries in Haiti that have helped to organize religious activities as well as provide social opportunities and civil service projects. Overall Haitians have been very open to change and adapt to modern technology when given the resources (Munos).

2.2.3 Political Environment

While Haiti is one of the oldest republics in the western hemisphere, oppression from poor national leadership has plagued the country in recent years. The United States and France have intervened numerous times to bring economic and political stability to the country. The government is very lax in regards to health and safety standards and generates little tax money to pay for public works projects. Thus, many public projects must be funded externally, largely through the United Nations or Non-Government Organizations (NGOs).

2.2.4 Initial Target Market

To create market penetration, an initial market will be targeted in Borgne, a small village on the Haiti's northern coast. This community is representative of most villages in Haiti. A Rochester non-profit, H.O.P.E. Haiti, also does work in the village. This will make the initial distribution and marketing more effective and can serve as a guide for the rest of the country.

Most residents in Borgne are farmers earning very little money. They typically live in houses as small as 10 by 15 feet. As many as 6 to 8 people can live in these small houses, often made of cinder block and sheet metal. At night, a family typically gathers in a common area to eat and socializes. If the family does not have a lantern or other light source, the family may go to bed around 8:00pm (Brownell).

Table 1 below summarizes the specific target market in terms of both demographics and psychographics.

Table 1: Demographics and Psychographics for Haiti

Demographics		Psychographics	
Under age 14	42%	"bed time"	8pm
Rural	75%	lighting sources used	kerosene, candles
Literacy Rate	61%	technology knowledge	very low
Daily Income	\$2	common night-time activities	cooking, reading, crafts
population/mi ²	758	media	signs in local market

2.3 Competitive Analysis

2.3.1 Kerosene and Candle Market

In most developing countries, including Haiti, fuel based lighting is the predominate form of space lighting. In Haiti, the two primary lighting options are kerosene hurricane lamps and candles. These are purchased at local markets with a distribution system that has been firmly established over the years.

Kerosene lamps cost about 3 or 4 dollars in Haiti. Kerosene fuel costs about 6 dollars a gallon or about 25 cents each night the lamp is used. Most of these lamps are glass hurricane lamps similar to ones used in the United States in the 1800's. One of the major problems with these lamps is that the glass is very prone to breaking. It costs over a dollar to replace the glass. A more compact kerosene lamp has been developed that uses a metal can with a wick coming out of the top. These cheaper lamps are also used in Haiti. However, this type of lamp covers everything in the room with soot and causes additional respiratory problems (Brownell).

Candles cost about 13 cents apiece in Haiti. Since they provide so little light, candles are not typically used for everyday activities. They are more often used as an emergency light source or for families who cannot afford kerosene. There is also a higher risk of house fire when burning candles (Brownell).

Since both of these lighting systems are very simple, no major improvements have been made in the kerosene or candle market. Since there is no competition to fuel based lighting besides electricity in the larger cities, there is no marketing or promotional material. In fact, since Haitians have such little disposable income, families are often faced with the decision of buying food or fuel at the local market. Food is always chosen above fuel. Due to the lack of competition or other options, Haitians have little choice when it comes to fuel based lighting systems. Haitians who do buy fuel based lighting can spend 17% or more of their annual income on lighting. (Americans spend far less than 1% of their annual income on lighting) (Mills). For this reason, many people choose not to use fuel based lighting and therefore go to bed when the sun goes down (Brownell).

2.3.2 Non-Profit and Charitable Organizations

When considering the competition to Green Power, non-profit and charitable organization must be considered. Due to a finite amount of money spent on grants and donations for developing nations such as Haiti, these organizations compete with Green Power indirectly for the same pool of money in both government and private sectors. While there is no other company or organization developing lighting solutions in Haiti, there are several organizations in other countries that distribute similar LED lamps.

The World Bank's International Finance Corporation spent more than 5 million dollars on their *Lighting Africa* program. This program gives money to private companies to develop renewable lighting options for people in Sub-Saharan Africa (World Bank Group 14). One of the most successful products to come out of this program is the BOGO solar powered flashlight. These flashlights are sold to people in the United States with the idea that half the money goes towards their flashlight and the other half goes towards giving someone in Africa a unit, "By One, Give One".

d.light Design is a for-profit company in India started by two Stanford MBA students. The company sells LED lamps in India and also has a non-profit arm *Give Light Program* that has raised over \$11,000. The company has been given over to a \$1,000,000 in funding from both U.S. and Indian organizations. Their lamps are charged by a wall outlet or solar panels (PRWeb).

The solar-powered "Tukimara" LED light is currently undergoing field testing in India while Stanford is developing LED lantern prototypes for use in the developing world with a concentration also on India (Sharma 2).

There exist numerous grants and donation money that is competed for everyday between different charitable organizations. Millions of dollars of charitable donations flow into Haiti each year. This money goes to humanitarian aid, non-profit and religious organizations (Munos).

2.4 Non-Profit Partnerships

While non-profits and charitable organizations could take support money away from Green Power, these organizations also have the potential to help the company financially and through strategic partnerships and promotional activities. Many churches raise money for the country of Haiti for no specific cause. An alliance with a religious organization such as World Vision could provide a subsidy for lantern units or could even provide large, one time donations for large quantities of lanterns.

The following is a list of non-profits that could potentially partner with Green Power

H.O.P.E. Outreach

HOPE Outreach is a Rochester non-profit that helps the people of Borgne, Haiti build infrastructure and increase standards of living. Green Power has already been in close contact with HOPE.

<http://www.hopehaiti.org>

S.O.I.L. (Sustainable Organic Integrated Livelihoods)

SOIL is a non-profit that concentrates its efforts on providing sewage systems, soil conservation and transforming waste into resources in Haiti. Sarah Brownell, co-founder of SOIL, is a 1998 graduate of RIT. Green Power has also been in contact with SOIL.

<http://www.oursoil.org>

World Vision

World Vision is a Christian organization that uses fundraising money to support children in countries including Haiti, give towards humanitarian projects and give micro-loans for Haitians to start or expand their own business.

<http://www.worldvision.org>

Christian Aid

Christian Aid is a UK based Christian organization that focuses on indigenous missionaries, child support, disaster relief and humanitarian projects. They have operations in countries around the world, including Haiti.

<http://www.christianaid.org/>

3.0 BUSINESS DESCRIPTION**3.1 Company Background**

Green Power was formed as a result of a senior design project at the Rochester Institute of Technology (RIT). Dr. Robert Stevens, a mechanical engineering professor at RIT, saw the need for a high efficiency, sustainable, and stand-alone lighting system for the people of Haiti. A grant of \$10,000 was secured from the Environmental Protection Agency (EPA) as part of its People, Prosperity and Planet campaign. The goal of the project was to investigate using Light Emitting Diode (LED) technology as a solution to lighting needs in Haiti as well as to provide and entrepreneurial venture. During the winter and spring of 2009, RIT students and faculty designed, built and tested a bike-powered LED lamp system. After a phase 2 grant was received for \$70,000, students and faculty at RIT decided to form a company around the products they developed.

Green Power currently operates in Rochester, New York. Operations will be moved to Haiti within the next year or two to give the management team direct control of manufacture and distribution of its products as well as to shorten the supply chain. A

supporting team of local supervisors, laborers and distributors will be hired once an assembly plant is built in Port-au-Prince, Haiti.

3.2 Product Offerings

Green Power's strategic plan is to become a world leader in human powered products that increase standards of living for impoverished citizens of the world. While Green Power currently is only working on two products, the Green Bike and Green Light, the company will continually develop its brand and diversify its product line. Future product offerings could include:

- water purification systems
- “treadle” pumps for water irrigation
- crank radios
- photovoltaic power systems

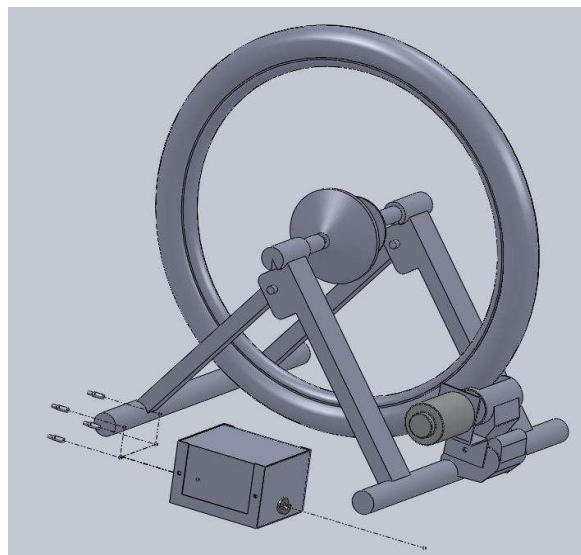
All of these products are in-line with the mission statement of Green Power:

“To provide clean and affordable power to citizens of underdeveloped nations.”

-Mission Statement

The first product that will be offered is the Green Bike power station, shown in Figure 1.

Figure 1: Green Bike



The Green Bike consists of everything shown above accept the wheel. The unit is made to be attached to the back wheel of a bike which is used to supply power to the unit. The unit generates electricity from the biker via a generator and uses the power to charge up to 4

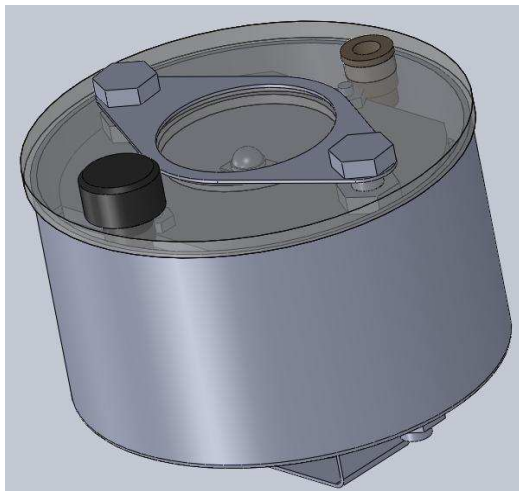
units at a time via DC plugs. The Green Light is the only unit thus far that can be charged with the Green Bike, but other products are expected to be added in the future.

The Green Bike will primarily be purchased by local merchants with the intent of starting a micro-business in his or her village. The Green Bike will provide power to charge the Green Light, a product described later. The entrepreneur will charge villagers a fee of \$0.20 to have their Green Lights charged. Since many local entrepreneurs will not be able to purchase the bike themselves, a lending program could very well be established by Green Power to enable entrepreneurs to better afford the large upfront cost of the Green Bike which is \$100.

Non-profit, religious and other Non-Governmental Organizations (NGOs) will also be targeted as customers for Green Bike. Since many of these organizations are aiming to improve living standards for people in underdeveloped nations, the Green Bike would be a great tool to provide power for those who have lagged far behind modern technological improvements. Most Green Bikes sold to NGOs would not be intended for use as a micro-business, but as a free source of power for the whole community. NGOs could also subsidize the price of the Green Bike to allow more entrepreneurs to purchase the units.

Green Light LED lamps will also be sold by Green Power. The Green Light is shown in Figure 2 below:

Figure 2: Green Light



The Green Light uses a high intensity LED to provide space lighting for small areas. The unit can be hung on the ceiling or from a stand and or can be carried as a flashlight. The design will be further developed to make mass-producing in Haiti possible and to improve upon the initial design by RIT students. Green Light has the following advantages over current kerosene lamps:

- The light output is 100 lumens, over three times that of a kerosene lantern

- Since the Green Light is human powered, there are no on-going fuel costs for the user, saving most Haitians over \$100 each year
- It is better for the environment and has no toxic emission users breathe in
- It is more robust and has no glass that cracks such as with the current kerosene lamps
- It creates a jobs in Haiti buy assembling the units in-country and provides a business opportunity for an entrepreneur to charge the units

4.0 MARKETING PLAN

4.1 Pricing

Since affordability is one of the top requirements for any product sold in developing nations, a simple cost-plus pricing strategy will be used. Parts, shipping, labor and distribution costs are \$17 per unit. An 18% markup will be implemented to bring the sale price to \$20. Kerosene lamps currently in use cost about \$4 in Haiti. However, with an ongoing need to purchase fuel to burn, annual costs of kerosene lamps can easily add up to over \$100 (Brownell). Thus, the Green Light will pay for itself in less than four months for most users.

Green Power has no intention of implementing price skimming or penetration pricing for the Green Light. The \$20 sale price is already at a level where it will take substantial sales volumes to break even. However, since the lantern will likely be sold to NGOs or foreign governments, bulk pricing will be offered for orders over 100 units. Bulk prices are as follows:

- 100-500 units: \$19.50/unit
- 500-1000 units: \$19.00/unit
- 1000-5000 units: \$18.50/unit
- 5000+ units: \$18.00/unit

The Green Bike costs \$90 for parts, shipping, distribution and labor. A cost-plus mark up of 11% is used to make the Green Bike more affordable to entrepreneurs, bringing the sale price to \$100.

Kerosene costs about \$0.13 per hour of use (Brownell), so 4 hours of lantern fuel would cost \$0.52. To ensure Green Light users are willing to buy the lamp, \$0.20 will be the recommended price for a Green Light charge lasting 7 hours. Haitians living near cities often pay \$0.25 or more for cell phone charges which require much less energy, so \$0.20 is a very reasonable per-charge price.

Like the Green Bike, the Green Light would not have any price skimming or alternative pricing strategies. However, it is likely that several churches and other NGOs would purchase or subsidize purchases for communities. Bulk order prices are as follows:

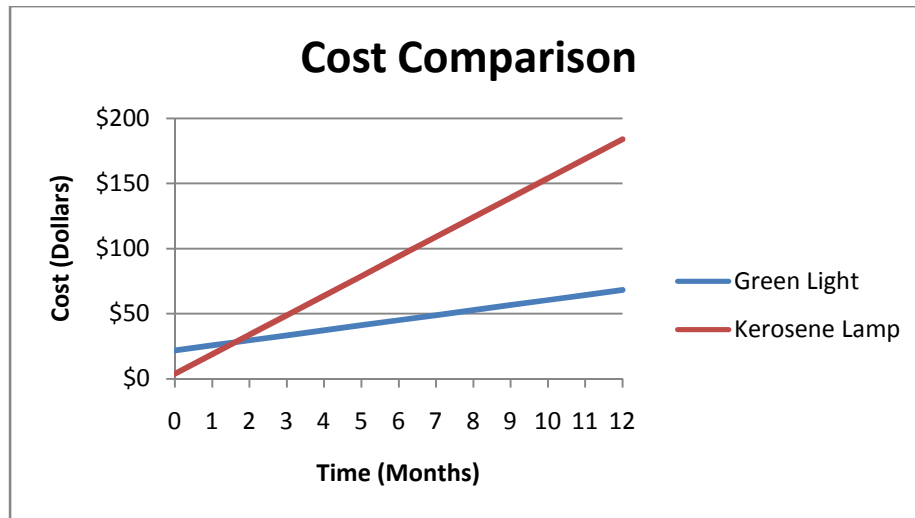
- 100-500: \$96.00/unit
- 500+: \$94.00/unit

Table 2: Pricing Strategy Overview

Quantity	Green Light	Green Bike
1-100	\$20.00	
100-500	\$19.50	
500-1000	\$19.00	
1000-5000	\$18.50	
5000+	\$18.00	
1-100		\$100.00
100-500		\$96.00
500+		\$94.00

While the initial product costs seem high considering most Haitians only make \$2 a day, the long-term cost savings versus kerosene makes the investment well worth it. Green Power, along with the Green Bike entrepreneurs, must make the customer in Haiti aware of the cost benefit of its products. Most Haitians look solely at up-front costs, so convincing them of long-term value is a critical. Green Power will promote this through brochures and local presentations and demonstrations. Figure 3 below shows the long-term costs of a kerosene lamp versus the Green Lamp.

Figure 3: Kerosene vs. Green Light Economics



It is important to note that due to low ownership costs of the Green Lamp, the unit pays for itself after just two months.

4.2 Distribution

Open air markets are where most Haitians go to purchase household items. These markets have many vendors that sell different products, including lamps and kerosene. Green Power will tap into these vendors and use the current open air markets to sell its products. Since kerosene fuel and lamps already have an established distribution system in place, Green Power will use these networks to distribute their own products. It is the hope that the same vendors who are currently buying and selling kerosene will buy the Green Bike and Green Light and be the primary vendor for the products. These vendors already have business skills as well as relationships with the target market, giving them a leg-up on any outsider who would try to sell alternative energy products in developing nations. New entrepreneurs will also likely start their own Green Bike businesses.

Distribution of Green Power products will include transporting the products from the domestic assembly plant to the different villages where the products would be sold to vendors. Small trucks are planned to be used for transportation. The trucks would be property of Green Power and the drivers would be Green Power employees.

Government organizations and NGOs will also play a significant role in distribution. The design team has already been in contact with two Rochester-based non-profits interested in the products, H.O.P.E. Haiti and S.O.I.L. These organizations could provide a great initial outlet for Green Power products. Other NGOs are likely to be interested in Green Power and could potentially buy as well as distribute the products in Haiti and other underdeveloped countries.

The strength of partnering with churches cannot be over emphasized. Americans give significant amounts of money each year to projects in Haiti. The Free Methodist Church for example has 6 missionaries in Haiti as well as about 60 local churches, most of which are support by US donors. Missionaries have already expressed interest in Green Power products (Munos). This provides a great opportunity for a partnership that could provide Green Power both sales volumes as well as distribution networks to begin to tap the local market. Also, about 70% of Haitians go to a church on a regular basis which provides a huge potential for Green Power exposure.

4.3 Promotion

Since underdeveloped countries such as Haiti lack most traditional marketing outlets such as widespread TV, Internet and billboards, non-traditional “gorilla” marketing techniques must be used to market Green Power products. Radio advertisements will be used to promote Green Power products, as well as advertisements in local newspapers and magazines.

Locally, signs will be displayed at local markets to attract new customers. Green Power products will be unique enough that they will draw attention of local residents simply by seeing other people using the Green Bike and Green Light. Product demonstrations will also take place throughout the country to further show residents the benefits of the products.

In order to promote Green Power to organizations in the U.S. and foreign countries, news stories will be published in order to reach potential donors. Press releases will be issued serving as one way of achieving this. Word of mouth and internet advertising are two other cost effective ways at getting potential donors. It is the goal that the Green Power story will be featured in a nationally broadcasted news show, newspaper or magazine.

In addition to the “bootstrapping” methods mentioned above, \$1,000 a month will be budgeted for the CEO to travel to different churches, schools and conventions to promote Green Power products. The point of these visits will be to explain the situation in Haiti and how Green Power can help people in Haiti. Donations will be taken at each location with an emphasis on trying to obtain high volume sales or commitments.

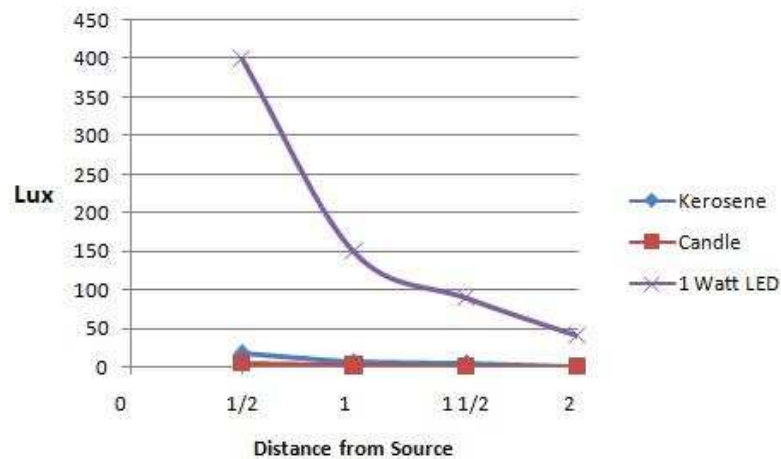
Since most people would not want to freely give their money to a for-profit company, a non-profit arm of Green Power will be established: Free Power. A similar marketing approach has been done by d.light Design, an LED lighting company in India. The for-profit company started a non-profit arm called the “Give Light Program” to attract US and UK citizens to donate lights for people in India (PRWeb). A similar approach could greatly help Green Power boost its sales volume as well as promote the social benefits of Green Power.

4.4 Value Proposition

With the lack of electric lighting so prevalent in Haiti, many people have a difficult time doing even simple tasks. School age children must read as much as possible during the day. At night, the only light that is available is a kerosene lantern that gives off a faint orange glow. Due to the low quality of these lights, most children do not even bother reading at night. Those who do read by kerosene light must breathe in harmful emissions as they study. The lack of adequate lighting to read at night is a major reason for low education levels in the country. With little education, most residents are forced to become farmers, as 75% of the country has done. With little money from farming, Haitians cannot afford to move to better living conditions and have no means to advance themselves in life. Thus, the circle of poverty is very much a reality for millions of Haitians.

With access to a high quality, free and clean source of light from the Green Light, Haitians could do activities at night easier than ever before, and in some cases never possible at all. Children could read, laborers could work and mothers could cook. Families would not be forced to go to sleep when the sun goes down. Since working days would be lengthened, educational levels would likely rise, and with it economic productivity and standards of living. Figure 4 shows the light output for LED lamps compared to candles and kerosene lamps.

Figure 4: Light Output



Not only would families have access to more and better light than from a kerosene lamp, they would also be saving money on kerosene fuel. Since some people spend 15% or more of their income on kerosene, a great deal of money could be saved and used to purchase other items to further increase the standard of living (Mills).

The message that Green Power will communicate about its product has several dimensions including:

- Low price in comparison with kerosene lamps.
- No toxic emissions or other health issues.
- Environmental friendly / sustainable products.
- More light output than kerosene and candles.

The possibility of starting a business and making money is also of interest to many Haitians considering how high unemployment is. Therefore, the micro-business implications of Green Bike also give it a great value proposition for many Haitians.

4.5 S.W.O.T Analysis

Table 3 below outlines the Strengths, Weaknesses, Opportunities and Threats for Green Power.

Table 3: SWOT Analysis

Internal Factors	Strengths	Weaknesses	External Factors	Opportunities	Threats
Management	CEO knows product in-depth, local contacts	little business skills	Economic	low-cost product low-cost employees	customers make very little money, low profit margins
Marketing	product has marketing plan	o brand awareness to date	Competition	No competition in Haiti, monopoly	foreign companies, NGOs vying for \$\$
Manufacturing	relatively simple construction	even simple parts could be hard to machine in Haiti	Demographic	customers are willing to adapt new technology	very poor customers
R&D	management has engineering background	customer feedback is hard to get while in the US	Technology	much better than current technology	electrification would make LED lamps obsolete
Product Offerings	Better than anything else in the Haiti market	limited only to lighting currently	Regulatory	Haiti has very little regulation to comply with	if sold in US or Europe, significant regulations would need to be met

Long-term cost effectiveness is the main strength for Green Power products. The relatively high product cost would easily be recouped by the money saved on kerosene fuel. Also, the product is “green” with no harmful emissions giving customers a healthier life. Since the management team also designed the Green Bike and Green Light, they are very familiar with the product and its capabilities. Product iteration also becomes easier in this regard.

The biggest threat to Green Power is that the customers have such little income. This makes it very hard to sell a higher technology product. This also dramatically shrinks the profit margins. Thus, high sales volumes will be needed to make the company successful. Non-profits or outside competitors could also take away market share from Green Power.

5.0 OPERATIONAL PLAN

5.1 Facilities

Green Power will begin corporate operations once a building is purchased in Haiti. The “rent vs. buy” decision for a building becomes apparent in the case of Haiti where property values are very low. A 2000 square foot building will be purchased in Port-au-Prince for approximately \$50,000. Additional space is projected to be needed during the third year of operation with a cost of \$25,000. Once Green Power becomes a house hold name in Haiti and generates significant sales volume, a newer facility will need to be purchased. This is projected in year five at a cost of \$100,000.

The building will be equipped with one computer and one phone to begin with. Furniture and other office supplies will also need to be purchased. A \$5,000 budget has been set aside for these costs as well as for any tools and machines that will be needed.

Port-au-Prince is the capital city of Haiti and has the country’s only international airport. It also has a large port and provides a relative centralized location for Haitian operations. Thus, Port-au-Prince provides an excellent location for Green Power to begin operations. A map of Haiti, with the location of Port-au-Prince as well as Borgne is shown in the Appendix.

5.2 Suppliers

In order to keep product costs down, Green Power will use the most cost effective components possible. For both the Green Bike and Green Light, about 90% of the components are “off-the-shelf” components. These components will be shipped to the company’s Port-au-Prince facility and stored either on the work floor or in a storage room, depending on how many parts are available. Components will be bought in as much bulk as possible in order to take advantage of volume price discounts.

5.3 Manufacturing/Machinery

A few custom parts will need to be manufactured at Green Power’s Port-au-Prince facility. Having the manufacturing done in Haiti will keep labor costs down while also providing local jobs and will further reduce the supply chain, helping to keep operations more streamlined. While the supply of “skilled” labor is low in Haiti, the manufacturing needed is fairly simple. The manufacturing that will need to be done includes drilling, lathing, cutting, milling and sanding. All of these manufacturing processes can be done with relatively inexpensive machinery and with little labor expertise. Raw materials needed for manufacture will be purchased from suppliers as cheaply as possible, provided there is adequate storage.

An initial investment of \$5,000 will be needed to provide the Port-au-Prince facility with the machinery necessary for manufacture and assembly of Green Power products. Years

two and three will each add an additional \$5,000 of machinery, while a \$20,000 machine upgrade will be invested in during year four. When Green Power moves into a larger facility (projected year five), a \$25,000 investment will be made in furniture, computers and tools.

5.4 Assembly and Testing

Assembly will be the primary job of most of the employees at Green Power. In the beginning, most of the assembly will be done with hand tools. As the company grows, more automated processes will be developed to provide a more efficient process.

A Quality Assurance (QA) program will be established to ensure that every Green Power product meets its desired specification. Measurements will be taken of machine cuts as well as assembly tolerances. "Performance Tests" will also be performed to ensure such things as electrical connections, power output, charge protection and structural integrity are up to Green Power standards. While products will not undergo rigorous tests required by International Organization for Standardization (ISO), a company specific QA program will ensure Green Power delivers quality products to its customers. "QA Inspected" will be put on each Green Power product.

5.5 Distributing

Green Power will distribute its products with company owned trucks. A small truck will be purchased as soon as the company begins production at an estimated cost of \$10,000. A second small truck will be purchased during the third year for an estimated \$10,000 and a larger truck will be purchased during the fourth year for an estimated \$20,000. Employees under the "labor employees" wage will drive the trucks, with early responsibilities shared by the manufacturers (the same workers will be assembling and driving trucks until volume picks up).

While roads in Haiti are not as good as the roads in the US, they are adequate to drive on and deliver Green Bikes and Green Lights to most villages. Deliveries will be made on an as-needed basis, depending on sales volume. During the first year, the truck will be used only part of the time, while after a few years multiple trucks will be used regularly.

5.6 Employees

Green Power will start with 2 "labor" employees and 1 "management" employee. A labor employee is an employee who will machine and assemble parts and/or drive the trucks. A management employee will be in charge of the inventory, sales, manufacturing and other operational activities needed. The number and wage of each employee is listed on the notes of the financial analysis, Tables 9 and 10.

At least one of the management employees will need to be proficient in both French and English in order to communicate effectively with the executives, employees and customers.

The first labor employee hired should have proficient knowledge in the various machines and could be a mentor to future employees with no manufacturing experience. The truck drivers should have a valid driver's license with no major driving issues.

The number of employees will grow in relative proportion to the volume of sales. More employees will be needed in all aspects of the company, particularly in distribution and logistics later on.

6.0 MANGEMENT PLAN

6.1 Executive Team

Green Power will be established as a Limited Liability Company with a single owner. The CEO will be Matt Walter, the lead engineer for the development of the Green Bike and Green Light at RIT. Mr. Walter will have 100% ownership in the company to begin with, but will be diluted by additional investors and executives coming on board.

If projected levels of growth occur, a Chief Operating Officer (COO) will be hired at the beginning of the fourth year of operation. The COO will assist the CEO in high level management and will be in close contact with the facility in Haiti. In order to attract a highly qualified individual, a percent of Green Power ownership will be offered to the COO in addition to his or her salary. The salaries for both the CEO and the COO are listed on the notes of the financial analysis, Tables 9 and 10.

6.2 Advisory Board

An advisory board will be established to assist the CEO and later the COO with operations of Green Power. The preliminary advisory board will be as follows:

Dr. Robert Stevens – Dr. Stevens served as the faculty advisor for the original design project at RIT and wrote both the phase 1 and phase 2 EPA grants that gave Green Power early seed money. Dr. Stevens is a mechanical engineering professor at RIT and helped found the “Energy and Environment” option in the department. Dr. Stevens has experience with renewable energy as well as design for developing world.

Dr. Richard DeMartino – Dr. DeMartino is a business professor at RIT and is the director of the Albert J. Simone Center for Innovation and Entrepreneurship. Dr. DeMartino specializes in strategic growth and commercialization of technology oriented products. Dr. DeMartino also served as a primary investigator for the phase 2 EPA grant.

Sarah Brownell – Ms. Brownell is a graduate of RIT and is the co-founder of the non-profit S.O.I.L in Haiti. Ms. Brownell works in Haiti to empower local people to use simple technologies and their own creativity to solve environmental and health problems and protect soil and water resources. Ms. Brownell served as an advisor during the design process at RIT.

Mike Shields – Mr. Shields is the CEO of eLogic Group, a management consulting firm specialized in B2B commerce optimization for manufacturers located in Rochester, NY. Mr. Shields also serves as the deputy executive director of H.O.P.E Haiti, a non-profit helping the people of Borgne, Haiti achieve increased standards of living. Mr. Shields has an economics degree from the University of Rochester and has a working knowledge of the French language.

Dr. Rose-Marie Chierici – Dr. Chierici is a native Haitian and currently a professor of Anthropology at State University of New York, Geneseo. Dr. Chierici co-founded the non-profit H.O.P.E. to actively pursue her vision of social justice and a better future for her homeland and helped the design team at RIT understand the cultural aspects of the design process.

7.0 DEVELOPMENT PLAN

7.1 Sustainable Operations

For any company to be successful it must have a sustainable product or service. With two billion people and growing still using kerosene based lighting in the world, Green Power has a product with sizable market potential. While operations will begin in Haiti, international opportunities will be considered once Green Power establishes its product and brand. Future markets could include:

- Honduras
- West Africa
- South Central Africa
- India

These locations are similar to Haiti in regards to electrification and lighting. There is no shortage of need for kerosene lighting substitutes.

As mentioned earlier, additional products will be added to the Green Power product line such as water purifiers, radios and pumps.

In addition to the product being sustainable, the organization of Green Power is sustainable. Since Green Power is a LLC with the CEO as majority shareholder, the company cannot be bought out. Also, given the nature of the market, there is little to limit how big the market share for Green Power could be.

7.2 Expected Growth

Sales of Green Lights are limited by the number of Green Bikes a particular location has. One Green Bike can support about 50 Green Lights depending on how often the lights are used. Since the Green Bike is the limiting product, growth is considered in regards to it.

For the first month of operation, 5 Green Bikes are expected to be sold. A monthly sales growth of 20% is predicted for year 1, dropping to 10% for the year 2 and 5% for year 3 through year 5. While this may be an optimistic goal, it should be achievable with good marketing and branding, especially if US donors contribute to product sales.

Expenditures are in line with company growth. As the sales volume increases, the number of employees, machines, trucks and size of facilities all need to grow. Figure 6 shows growth for both revenue and net profit.

7.3 Contingency Plan

Should Green Power fail to succeed as a new venture, alternative options must be considered. A strategic planning session with the advisory board should be called upon to offer alternative business options such as new market, new product or the size of the company. If these measures still fail to make the company profitable, or if investment money does not come, Green Power should consider reorganizing into a non-profit. Green Power could partner with an existing LED lamp manufacturer such as d.Light Design and support their efforts of developing world lighting. Whatever direction Green Power takes, it should be in-line with the company mission statement: “To provide clean and affordable power to citizens of underdeveloped nations.”

8.0 FINANCIAL PLAN

8.1 Costs

Green Power costs can be broken down into fixed costs and variable costs. Fixed costs are independent of volume, while variable costs are per unit. In reality, fixed costs are to a degree dependent on volume, however they are assumed independent for breakeven analysis. Table 4 outlines the first year costs for Green Power. This table can be used as an outline for future years.

Table 4: Costs

Fixed Costs ¹		
Item	Monthly Cost	Assumption
Capital Costs	\$4,500	Based on average capital cost for a given month
Labor Wages	\$240	2 "labor" employees making \$4/day
Management Wages	\$180	1 "management" employee making \$6/day
Executive Wages	\$3,000	Compensation for Green Light CEO
Plane Tickets	\$150	Travel for CEO to Port-au-Prince (3, \$600 flights a year)
Lodging	\$150	Hotel for CEO in Port-au-Prince (\$60/day for 10 days each visit)
Marketing in Haiti	\$150	demos, radio ads, signs, brochures, website
U.S. Fundraising	\$1,000	Presentations at Churches, schools, conventions, etc.
Total Fixed Costs	\$9,370	

Variable Costs ²		
Item	Unit Cost	Assumption
Green Bike		
Materials	\$80	Cost of all components including shipping
Distribution in Haiti	\$10	Unit are distributed by truck on an as-needed basis
Total Bike Variable Costs	\$90	COGS
Green Light		
Materials	\$15	Cost of all components including shipping
Distribution in Haiti	\$2	Unit are distributed by truck on an as-needed basis
Total Bike Variable Costs	\$17	COGS

- Notes: 1. Fixed costs change for each month. The costs presented here are 1st year values used to find break-even.
 2. Variable costs stay constant no matter how many units are produced. Distribution costs are for truck fuel only.

8.2 Breakeven Analysis

When variable costs are known, a break even analysis can be performed to determine the number of units needed to break even. This analysis shows if the venture is really worth the time, money and energy needed for success. A breakeven analysis is performed in Table 5.

Table 5: Breakeven Analysis

Fixed Monthly Costs	\$9,370
Bike COGS	\$90
Selling Price ¹	\$100
Bike Contribution Margin (CM)	\$10
Light COGS	\$17
Selling Price ²	\$20
Light Contribution Margin (CM)	\$3
"Packages" per Month to Break-Even³	58.6

- Notes: 1. Bike price based on cost-plus pricing (~10%)
 2. Light price based on cost-plus pricing (~18%)
 3. "Package" consists of 1 bike and 50 lights

Breakeven is calculated using the following equation: $BE = \frac{Fixed\ Costs}{Cont\ Marg_{Bike} + 50Cont\ Marg_{Light}}$

The breakeven point is 58.6 “packages” sold each month, or 59 Green Bikes and 2930 Green Lights. This is assuming first year fixed costs.

8.3 Five Year Predictions

A detailed financial analysis is performed for the first five years of operation, with a month-by-month analysis for the first three years. Data from Table 4 and Table 5 are incorporated into the financial model. Tables 6 through 8 show the five year financial analysis. Tables 9 and 10 outline the assumptions that went into the model.

Table 6: 5 Year Financial Analysis: Year 1

	Month												Year 1	
	0	1	2	3	4	5	6	7	8	9	10	11	12	
Capital Expenses ¹	\$65,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$65,000
Labor Wages ²		\$240	\$240	\$240	\$240	\$240	\$240	\$240	\$240	\$240	\$360	\$360	\$360	\$3,240
Management Wages ³		\$180	\$180	\$180	\$180	\$180	\$180	\$180	\$180	\$180	\$180	\$180	\$180	\$2,160
Executive Wages ⁴		\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$36,000
Plane Tickets ⁵		\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$1,800
Lodging ⁶		\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$1,800
Marketing in Haiti ⁷		\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$1,800
U.S. Fundraising ⁸		\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$12,000
Total Expenses	\$65,000	\$4,870	\$4,870	\$4,870	\$4,870	\$4,870	\$4,870	\$4,870	\$4,870	\$4,870	\$4,990	\$4,990	\$4,990	\$123,800
CM Bike		\$10	\$10	\$10	\$10	\$10	\$10	\$10	\$10	\$10	\$10	\$10	\$10	
Bikes Sold ⁹		5	6	7	8	10	12	15	18	22	26	31	37	197
Bike Sales		\$50	\$60	\$70	\$80	\$100	\$120	\$150	\$180	\$220	\$260	\$310	\$370	\$1,970
CM Light		\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3	
Lights Sold ¹⁰		250	300	350	400	500	600	750	900	1,100	1,300	1,550	1,850	9,850
Light Sales		\$750	\$900	\$1,050	\$1,200	\$1,500	\$1,800	\$2,250	\$2,700	\$3,300	\$3,900	\$4,650	\$5,550	\$29,550
Total Revenue	\$0	\$800	\$960	\$1,120	\$1,280	\$1,600	\$1,920	\$2,400	\$2,880	\$3,520	\$4,160	\$4,960	\$5,920	\$31,520
Operating Profit	-\$65,000	-\$4,070	-\$3,910	-\$3,750	-\$3,590	-\$3,270	-\$2,950	-\$2,470	-\$1,990	-\$1,350	-\$830	-\$30	\$930	-\$92,280
Net Profit¹¹	-\$65,000	-\$69,070	-\$72,980	-\$76,730	-\$80,320	-\$83,590	-\$86,540	-\$89,010	-\$91,000	-\$92,350	-\$93,180	-\$93,210	-\$92,280	

Table 7: 5 Year Financial Analysis: Year 2

	Month												Year 2
	13	14	15	16	17	18	19	20	21	22	23	24	
Capital Expenses ¹	\$5,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$5,000
Labor Wages ²	\$638	\$638	\$638	\$638	\$638	\$638	\$1,020	\$1,020	\$1,020	\$1,020	\$1,020	\$1,020	\$9,945
Management Wages ³	\$390	\$390	\$390	\$390	\$390	\$390	\$585	\$585	\$585	\$585	\$585	\$585	\$5,850
Executive Wages ⁴	\$3,500	\$3,500	\$3,500	\$3,500	\$3,500	\$3,500	\$3,500	\$3,500	\$3,500	\$3,500	\$3,500	\$3,500	\$42,000
Plane Tickets ⁵	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$1,800
Lodging ⁶	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$1,800
Marketing in Haiti ⁷	\$200	\$200	\$200	\$200	\$200	\$200	\$200	\$200	\$200	\$200	\$200	\$200	\$2,400
U.S. Fundraising ⁸	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$12,000
Total Expenses	\$11,028	\$6,028	\$6,028	\$6,028	\$6,028	\$6,028	\$6,605	\$6,605	\$6,605	\$6,605	\$6,605	\$6,605	\$80,795
CM Bike	\$10	\$10	\$10	\$10	\$10	\$10	\$10	\$10	\$10	\$10	\$10	\$10	
Bikes Sold ⁹	41	45	50	55	61	67	74	81	89	98	108	119	888
Bike Sales	\$410	\$450	\$500	\$550	\$610	\$670	\$740	\$810	\$890	\$980	\$1,080	\$1,190	\$8,880
CM Light	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3	
Lights Sold ¹⁰	2,050	2,250	2,500	2,750	3,050	3,350	3,700	4,050	4,450	4,900	5,400	5,950	44,400
Light Sales	\$6,150	\$6,750	\$7,500	\$8,250	\$9,150	\$10,050	\$11,100	\$12,150	\$13,350	\$14,700	\$16,200	\$17,850	\$133,200
Total Revenue	\$6,560	\$7,200	\$8,000	\$8,800	\$9,760	\$10,720	\$11,840	\$12,960	\$14,240	\$15,680	\$17,280	\$19,040	\$142,080
Operating Profit	-\$4,468	\$1,173	\$1,973	\$2,773	\$3,733	\$4,693	\$5,235	\$6,355	\$7,635	\$9,075	\$10,675	\$12,435	\$61,285
Net Profit¹¹	-\$96,748	-\$95,575	-\$93,603	-\$90,830	-\$87,098	-\$82,405	-\$77,170	-\$70,815	-\$63,180	-\$54,105	-\$43,430	-\$30,995	

Table 8: 5 Year Financial Analysis: Year 3 to Year 5

	Month												Year 3	Year 4	Year 5
	25	26	27	28	29	30	31	32	33	34	35	36			
Capital Expenses ¹	\$15,000	\$0	\$0	\$0	\$0	\$0	\$25,000	\$0	\$0	\$0	\$0	\$0	\$40,000	\$40,000	\$125,000
Labor Wages ²	\$1,350	\$1,350	\$1,350	\$1,350	\$2,025	\$2,025	\$2,025	\$2,025	\$2,025	\$2,025	\$2,025	\$2,025	\$21,600	\$36,000	\$59,400
Management Wages ³	\$840	\$840	\$840	\$840	\$840	\$840	\$840	\$840	\$840	\$840	\$840	\$840	\$10,080	\$16,200	\$23,040
Executive Wages ⁴	\$4,000	\$4,000	\$4,000	\$4,000	\$4,000	\$4,000	\$4,000	\$4,000	\$4,000	\$4,000	\$4,000	\$4,000	\$48,000	\$112,000	\$128,000
Plane Tickets ⁵	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$1,800	\$3,600	\$3,600
Lodging ⁶	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$1,800	\$3,600	\$3,600
Marketing in Haiti ⁷	\$250	\$250	\$250	\$250	\$250	\$250	\$250	\$250	\$250	\$250	\$250	\$250	\$3,000	\$3,600	\$6,000
U.S. Fundraising ⁸	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$18,000	\$24,000	\$30,000
Total Expenses	\$22,740	\$7,740	\$7,740	\$7,740	\$8,415	\$8,415	\$33,415	\$8,415	\$8,415	\$8,415	\$8,415	\$8,415	\$144,280	\$239,000	\$378,640
CM Bike	\$10	\$10	\$10	\$10	\$10	\$10	\$10	\$10	\$10	\$10	\$10	\$10			
Bikes Sold ⁹	125	131	138	145	152	160	168	176	185	194	204	214	1,992	3577	6424
Bike Sales	\$1,250	\$1,310	\$1,380	\$1,450	\$1,520	\$1,600	\$1,680	\$1,760	\$1,850	\$1,940	\$2,040	\$2,140	\$19,920	\$38,590	\$75,870
CM Light	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$3			
Lights Sold ¹⁰	6,250	6,550	6,900	7,250	7,600	8,000	8,400	8,800	9,250	9,700	10,200	10,700	99,600	192,950	379,350
Light Sales	\$18,750	\$19,650	\$20,700	\$21,750	\$22,800	\$24,000	\$25,200	\$26,400	\$27,750	\$29,100	\$30,600	\$32,100	\$298,800	\$578,850	\$1,138,050
Total Revenue	\$20,000	\$20,960	\$22,080	\$23,200	\$24,320	\$25,600	\$26,880	\$28,160	\$29,600	\$31,040	\$32,640	\$34,240	\$318,720	\$617,440	\$1,213,920
Operating Profit	-\$2,740	\$13,220	\$14,340	\$15,460	\$15,905	\$17,185	-\$6,535	\$19,745	\$21,185	\$22,625	\$24,225	\$25,825	\$174,440	\$378,440	\$835,280
Net Profit¹¹	-\$33,735	-\$20,515	-\$6,175	\$9,285	\$25,190	\$42,375	\$35,840	\$55,585	\$76,770	\$99,395	\$123,620	\$149,445		\$527,885	\$1,363,165

Table 9: Notes on Financial Analysis

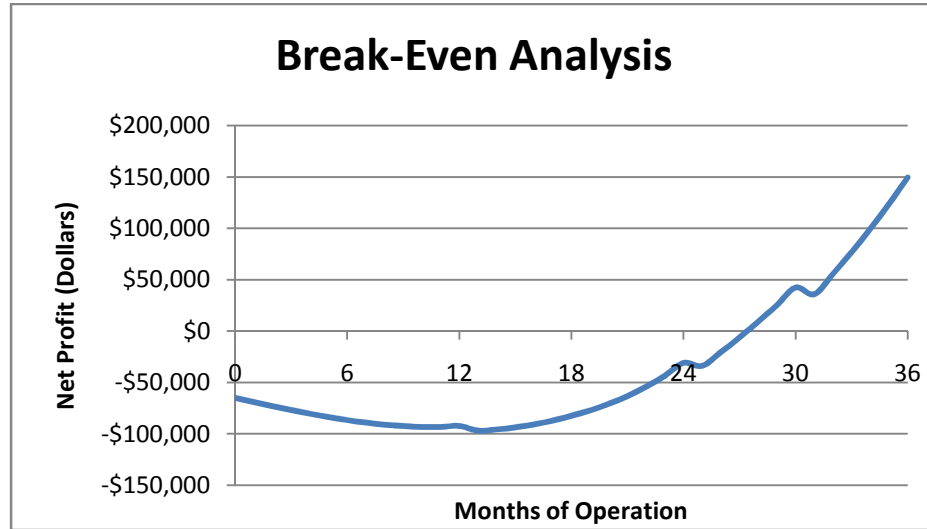
- Notes:
1. The following expenses are included in the capital costs
 - Year 1, Month 0: \$10,000 for a delivery truck
 - \$50,000 for a building in Port-au-Prince (~1500 sq ft)
 - \$5,000 for computer, tools, furniture, etc
 - Year 2, Month 1: \$5,000 for additional machinery (lathes, drills, hand tools, etc)
 - Year 3, Month 1: \$10,000 for additional delivery truck
 - \$5,000 for additional machinery
 - Year 3, Month 6: \$25,000 for building expansion
 - Year 4, Month 1: \$20,000 for additional delivery truck (larger for high volume)
 - \$20,000 for additional machinery (high volume)
 - Year 5, Month 1: \$100,000 for new building (or expansion of original)
 - \$25,000 furniture, computers, tooling etc for new building
 2. The following expenses are included in the labor costs (all at 30 days a month)
 - Year 1, Month 1: 2 employees at \$4/day
 - Year 1, Month 10: 3 employees at \$4/day
 - Year 2, Month 1: 5 employees at \$4.25/day
 - Year 2, Month 7: 8 employees at \$4.25/day
 - Year 3, Month 1: 10 employees at \$4.50/day
 - Year 3, Month 5: 15 employees at \$4.50/day
 - Year 4, Month 1: 20 employees at \$5/day
 - Year 5, Month 1: 30 employees at \$5.50/day
 3. The following expenses are included in the management costs (all at 30 days a month)
 - Year 1, Month 1: 1 employee at \$6/day
 - Year 2, Month 1: 2 employees at \$6.50/day
 - Year 2, Month 7: 3 employees at \$6.50/day
 - Year 3, Month 1: 4 employees at \$7/day
 - Year 4, Month 1: 6 employees at \$7.50/day
 - Year 5, Month 1: 8 employees at \$8/day
 4. The following expenses are included in the executive wages (salary comensation)
 - Year 1: 1 CEO at \$36,000/year
 - Year 2: 1 CEO at \$42,000/year
 - Year 3: 1 CEO at \$48,000/year
 - Year 4: 1 CEO at \$56,000/year
 - 1 COO at \$56,000/year
 - Year 5: 1 CEO at \$60,000/year
 - 1 COO at \$60,000/year
 5. Plane tickets cost \$600 round trip, 3 round trip flights a year for each executive.
 6. \$60/night for 10 nights in hotel in Port-au-Prince for each executive trip

Table 10: Notes on Financial Analysis (Continued)

- Notes(Cont):
7. Marketing expenses in Haiti
 - Year 1: \$1000 for local radio advertising
 \$500 for product demonstrations
 \$200 for signs and pamphlets
 \$100 for website development
 - Year 2: \$1200 for local radio advertising
 \$500 for product demonstrations
 \$200 for signs and pamphlets
 \$200 for website development
 \$300 for newspaper and magazine advertising
 - Year 3: \$1200 for local radio advertising
 \$500 for product demonstrations
 \$300 for signs and pamphlets
 \$100 for website development
 \$900 for newspaper and magazine advertising
 - Year 4: \$1600 for local radio advertising
 \$700 for product demonstrations
 \$300 for signs and pamphlets
 \$200 for website development
 \$800 for newspaper and magazine advertising
 - Year 5: \$2000 for local radio advertising
 \$700 for product demonstrations
 \$500 for signs and pamphlets
 \$300 for website development
 \$2500 for newspaper and magazine advertising
 8. US fundraising includes visits to Churches, schools, conventions, PR events, etc.
 9. Bike sale growth rates are as follows
 - Year 1: 20% monthly growth
 - Year 2: 10% monthly growth (314% annual growth)
 - Year 3: 5% monthly growth (80% annual growth)
 - Year 4: 5% monthly growth (80% annual growth)
 - Year 5: 5% monthly growth (80% annual growth)
 10. Assuming 50 light sales for each bike sale (charging capacity)
 11. This is the net profit from beginning of operation, used for break-even determination

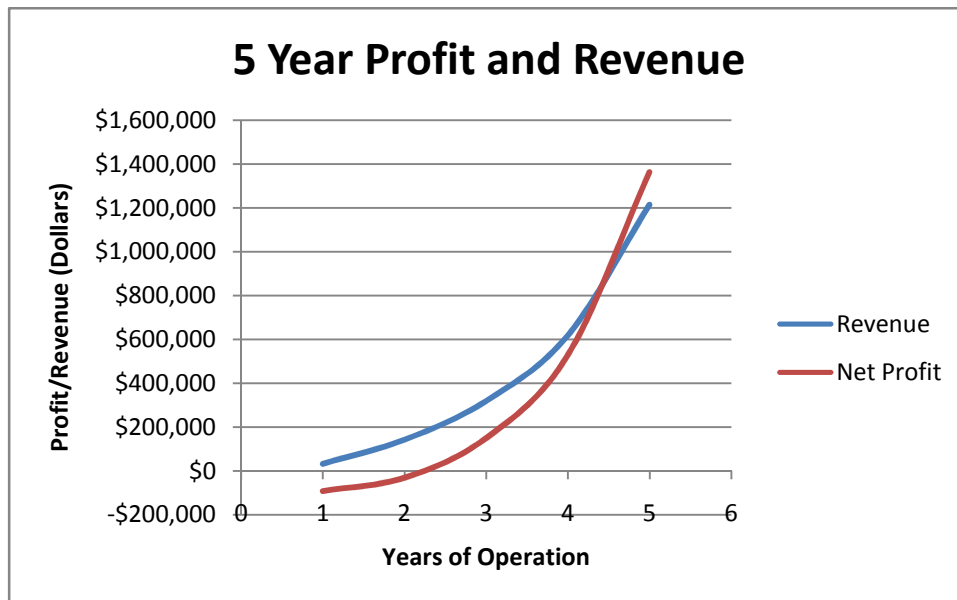
Based on the information generated from Tables 6 through 8, a breakeven time of about 27 months was determined. Figure 5 shows the breakeven analysis for the first three years.

Figure 5: Breakeven Analysis



In addition to the breakeven point, it is important to note both the sales volume and the corresponding revenue and net profit during the first five years. At the end of five years, Green Power is projected to have sales of \$1.2 million with a net profit of \$1.4 million (Net profit is calculated as the ongoing profit from year one). Five year revenue and net profits are shown in Figure 6 below.

Figure 6: 5 Year Profit and Revenue



8.4 Venture Funding

Based on predicted expenses, sales revenues and growth rate, Green Power will need \$100,000 in funding in order to become a successful company. This money is likely to

come from government grants such as the Small Business Innovation Research Grant, angel investors, family and friends. Investors will be given a percentage of ownership in the company for their investments.

8.5 Vendor Business Model

Since the primary buyers of Green Bikes are vendors who will start their own micro-business, a financial model of the vendor’s Green Bike business is an important component to Green Power’s success. Green Bikes are sold to vendors for \$100 a unit. Additionally, the owners of the Green Bike will likely pay \$5 per year for repairs such as replacing the tire, chain or other components. This makes the COGS for the owner \$105. This cost must be recuperated by selling charges to people in the area who own Green Lights. The recommended fee per charge is \$0.20. This is much lower than the average nightly kerosene fuel cost and gives the user a much brighter and longer lasting light.

The vendor also will earn money buy reselling Green Lights. Green Lights will be sold to the vendor for \$20 and the vendor resells the units for \$22. The vendor will be required buy Green Power to replace batteries for each Green Light when needed. This will cost the vendor \$4 every 3 years. Thus, the contribution margin for each Green Light sold is \$1.92. In order to breakeven on the cost of the Green Bike, the vendor must sell 52 Green Lights, which is near the limit of number of Green Lights that can be charged by one Green Bike. However, with the additional profit of selling charges, the \$100 cost is easily recuperated.

Table 11 shows the COGS and breakeven analysis for the vendor owning the Green Bike.

Table 11: Vendor Breakeven Analysis

Fixed Expenses		
COGS Bike	\$100.00	
Bike Repairs ¹	\$5.00	/year
Total Bike Cost	\$100.42	
 Variable Expenses		
COGS Light	\$20.00	
Light Support ²	\$4.00	/3 years
Total Light Cost	\$20.08	
Light Price ³	\$22.00	
Contribution Margin	\$1.92	
 Break-Even⁴	 52.39	 units

- Notes: 1. tire, chain, generator, etc wear out
 2. Batteries need to be replaced every 5 years
 3. Price based on cost-plus pricing (10%)
 4. This is on the upper limit of what one bike can handle. However, additional revenue from charging is not considered.

Table 12: Vendor Yearly Financials

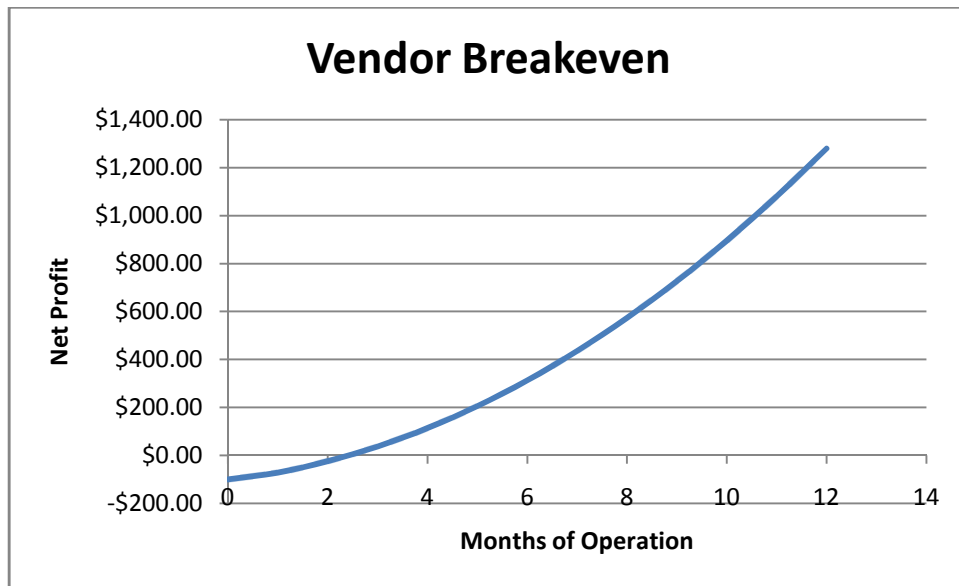
	Month												Year 1	Year 2 - on		
	0	1	2	3	4	5	6	7	8	9	10	11	12			
Capital ¹	100														\$100.00	\$0.00
Bike Repair		0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42		\$5.00	\$5.00
Total Expenses	\$100.00	\$0.42	\$0.42	\$0.42	\$0.42	\$0.42	\$0.42	\$0.42	\$0.42	\$0.42	\$0.42	\$0.42	\$0.42	\$0.42	\$105.00	\$5.00
CM Light		\$1.92	\$1.92	\$1.92	\$1.92	\$1.92	\$1.92	\$1.92	\$1.92	\$1.92	\$1.92	\$1.92	\$1.92			
# Lights Sold ²		5	5	4	4	4	4	4	4	4	4	4	4		50	0
Light Sales		\$9.60	\$9.60	\$7.68	\$7.68	\$7.68	\$7.68	\$7.68	\$7.68	\$7.68	\$7.68	\$7.68	\$7.68		\$96.00	\$0.00
# charges sold ³		96	192	269	346	423	500	577	654	731	808	885	962		\$6,442.31	\$6,442.31
Charge Sales ⁴		19.2	38.5	53.8	69.2	84.6	100.0	115.4	130.8	146.2	161.5	176.9	192.3		\$1,288.46	\$1,288.46
Total Revenue		\$28.83	\$48.06	\$61.53	\$76.91	\$92.30	\$107.68	\$123.06	\$138.45	\$153.83	\$169.22	\$184.60	\$199.99	\$184.60	\$1,384.46	\$1,288.46
Profit	-\$100.00	\$28.41	\$47.64	\$61.11	\$76.49	\$91.88	\$107.26	\$122.65	\$138.03	\$153.42	\$168.80	\$184.19	\$199.57	\$184.19	\$1,279.46	\$1,283.46
Net Profit	-\$100.00	-\$71.59	-\$23.94	\$37.17	\$113.66	\$205.54	\$312.80	\$435.45	\$573.49	\$726.90	\$895.70	\$1,079.89	\$1,279.46			

- Notes: 1. Only capital cost is initial bike purchase
 2. Maximum of 50 lights can be charged with on bike. Assume all light sales in first year.
 3. Charges based on average 1.56 days/charge for each light. This is based on battery lifetime and usage rates.
 4. \$0.20 per charge

Table 12 on the previous pages shows the month-by-month financials for the vendor for the first year. The breakeven point is around two and a half months. The net profit the first year is \$1,279. For the second year on, the vendor makes a profit of \$1,283, due to no additional Green Bike purchases or Green Light sales. Thus, the vendor makes about \$3.50 per day, or almost twice the national average.

Figure 7 shows the breakeven analysis for the vendor. After the first year there is a net profit of \$1,283 per year.

Figure 7: Vendor Breakeven



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10.0 APPENDIX





Table 13: Demographics

Geography	
Area - comparative:	slightly smaller than Maryland
Land boundaries:	<i>total:</i> 360 km <i>border countries:</i> Dominican Republic 360 km
Environmental issues:	extensive deforestation (much of the remaining forested land is being cleared for agriculture and used as fuel); soil erosion; inadequate supplies of potable water

People	People
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Population:	8,924,553 <i>note:</i> estimates for this country explicitly take into account the effects of excess mortality due to AIDS; this can result in lower life expectancy, higher infant mortality, higher death rates, lower population growth rates, and changes in the distribution of population by age and sex than would otherwise be expected (July 2008 est.)
Age structure:	<i>0-14 years:</i> 41.8% (male 1,881,509/female 1,851,591) <i>15-64 years:</i> 54.7% (male 2,386,761/female 2,495,233) <i>65 years and over:</i> 3.5% (male 135,695/female 173,764) (2008 est.)
Median age:	<i>total:</i> 18.5 years <i>male:</i> 18.1 years <i>female:</i> 19 years (2008 est.)
Population growth rate:	2.493% (2008 est.)
Ethnic groups:	black 95%, mulatto and white 5%
Religions:	Roman Catholic 80%, Protestant 16% (Baptist 10%, Pentecostal 4%, Adventist 1%, other 1%), none 1%, other 3% <i>note:</i> roughly half of the population practices voodoo
Languages:	French (official), Creole (official)
Literacy:	<i>definition:</i> age 15 and over can read and write <i>total population:</i> 52.9% <i>male:</i> 54.8% <i>female:</i> 51.2% (2003 est.)

Economy

GDP (purchasing power parity):	\$12.15 billion (2008 est.)
GDP (official exchange rate):	\$6.966 billion (2008 est.)
GDP - real growth rate:	2.3% (2008 est.)
GDP - per capita (PPP):	\$1,400 (2008 est.)
GDP - composition by sector:	<i>agriculture: 28%</i> <i>industry: 20%</i> <i>services: 52% (2004 est.)</i>
Labor force:	3.6 million <i>note: shortage of skilled labor, unskilled labor abundant (1995)</i>
Labor force - by occupation:	<i>agriculture: 66%</i> <i>industry: 9%</i> <i>services: 25% (1995)</i>
Unemployment rate:	widespread unemployment and underemployment; more than two-thirds of the labor force do not have formal jobs (2002 est.)
Household income or consumption by percentage	<i>lowest 10%: 0.7%</i> <i>highest 10%: 47.7% (2001)</i>
Investment (gross fixed):	28.9% of GDP (2008 est.)
Budget:	<i>revenues: \$820.6 million</i> <i>expenditures: \$965.2 million (2008 est.)</i>
Inflation rate (consumer prices):	15.8% (2008 est.)
Commercial bank prime lending rate:	46.99% (31 December 2007)
Industries:	sugar refining, flour milling, textiles, cement, light assembly based on imported parts
Electricity - production:	549 million kWh (2006 est.)
Electricity - consumption:	330 million kWh (2006 est.)
Oil - consumption:	 12,370 bbl/day (2006 est.)
Current account balance:	 -\$664 million (2008 est.)
Exports:	 \$491 million f.o.b. (2008 est.)
Exports - commodities:	 apparel, manufactures, oils, cocoa, mangoes, coffee

Communications

Telephones - main lines in use:	150,000 (2006)
Telephones - mobile cellular:	2.2 million (2007)
Radio broadcast stations:	AM 41, FM 26, shortwave 0 (1999)
Television broadcast stations:	2 (plus a cable TV service) (1997)
Internet users:	1 million (2007)

Transportation

Roadways:	<i>total:</i> 4,160 km <i>paved:</i> 1,011 km <i>unpaved:</i> 3,149 km (2000)
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Source: CIA World Factbook

Figure 8: Map of Haiti



Source: www.geology.com