

Business Plan

CHE 506 - Entrepreneurship and IP Management



ShineBright

ELECTRICITY FOR ALL

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1. Problem statement

Citizens in rural villages of India, like Fateh Nagla, do not have access to electricity in their houses, schools and workplaces. As result, children cannot study and do homework, these villages cannot develop their economy and the citizens have many difficulties to overcome poverty.

1.1. Background

There is no doubt about the importance of electric power. It has become an essential part of our daily routine to such an extent that life, as we know it nowadays, is unfathomable without electricity. Not only is it essential for the industry or the economy of a country, but also at home to cover basic needs such as cooking, lighting, refrigeration and other devices services. So, it is not an overstatement to say that electricity helps keep the world running.

Therefore, there is no doubt that having an effective energy supply plays a huge role in the development of a country.

First, lack of electricity entails poor food production and conservation. For instance, irrigation becomes a difficult task to carry out and means that there will be more damages in agriculture, lowering productivity as well as quality.

Secondly, not having access to power builds a barrier to progress for inhabitants of the country. In fact, it poses a problem to education, the environment, life expectancy and health of people. All of them key factors in the development of any country.

Furthermore, without good electricity there are less job and investment opportunities. This leads to scarcity of appropriate infrastructure. All this makes it really difficult for the economy to thrive.

A good example of these issues can be seen in India, where Prime Minister Modi has announced 100% of village electrification, but still around 31 million homes remain in the dark. Supply is often unstable and even absent in certain regions of the country. (1)

The following figures show India's electricity power demand and supply from April 2017 to March 2018.

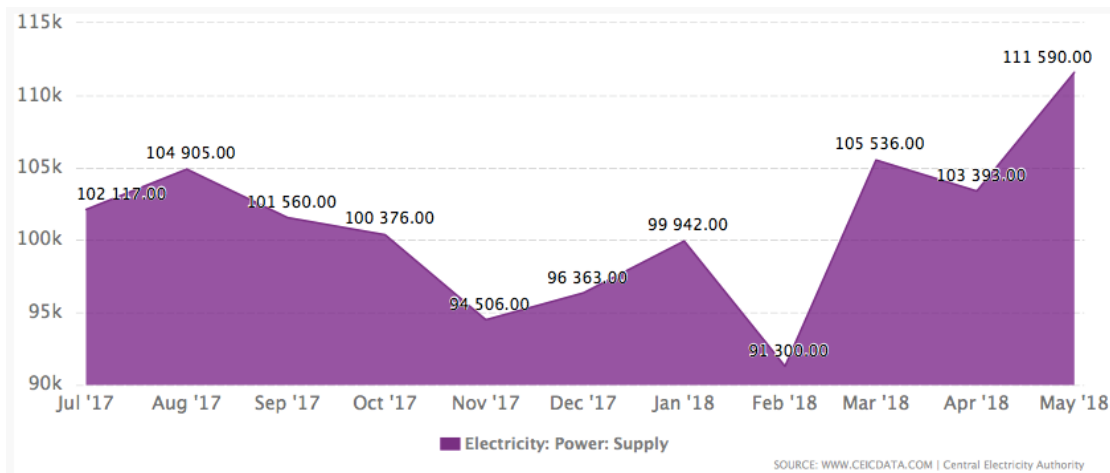


Figure 1. Electricity power supply in GWh. (2)

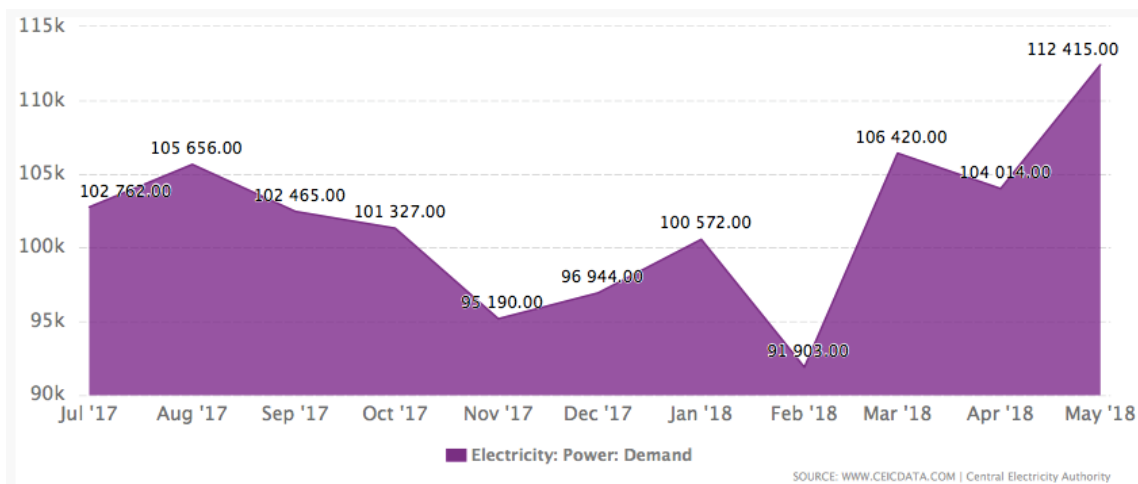


Figure 2. Electricity power demand in GWh (2)

It can easily be deduced from the graphs above, that there is a problem regarding insufficient supply of electricity. Consequently, people from India face the difficulties derived from poor access to electric energy that were previously explained.

In this matter, one of the most affected areas in India is Uttar Pradesh (UP). According to Central Electricity Authority (CEA) report, the average peak demand in UP between April 2017 and March 2018 was 20,274 MW against the availability of 18,061 MW, with the state not being able to meet the peak demand to the extent of 2,213 MW. This means a deficit of 10.9%, which is more than 5 times the deficit of the whole country average (2%). Moreover, it is even more alarming the fact that it has increased if we compare it with the 9.8% average deficit between April 2016 and March 2017. (n.d.)

This is the reason why we will be focusing our problem and business plan in providing electricity to a village of this area called Fateh-Nagla.



1.2. Consequences of the problem statement

The lack of electricity is the main reason why villages and rural areas are much less developed than urban areas. The comparison between urban and rural India helps to understand the impact that no access to electricity has on the population. Literacy levels in rural villages are still far behind the levels of urban citizens, health indicators are devastating and the net attendance to primary and secondary education is very different when comparing rural and urban cities.

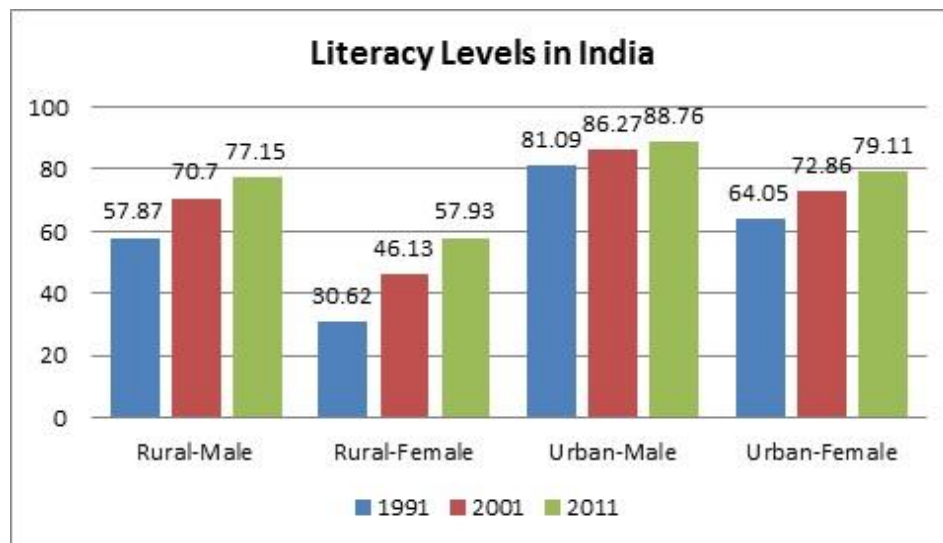


Figure 3. Literacy urban and rural levels in India. (4)

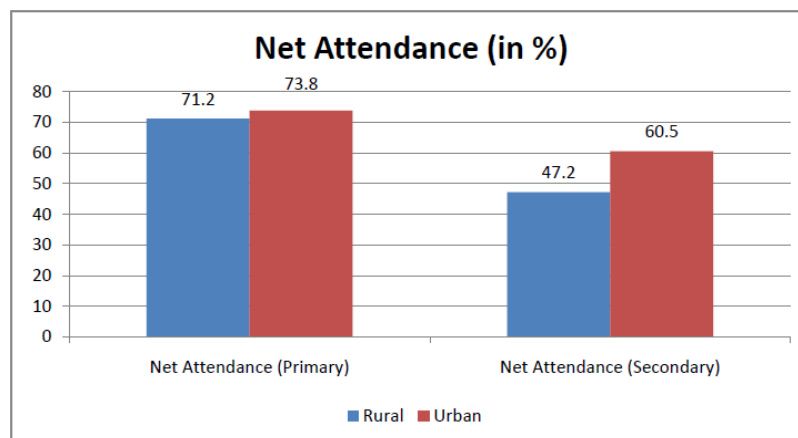


Figure 4. Net attendance percentage comparison between rural and urban areas. (4)

Another aspect of life that is affected by this lack of electricity is the poor development of their agriculture and cattle raising. As there is no proper access to electricity, irrigation or minimum animal healthcare systems cannot be implemented. This undoubtedly aggravate the quality of nutrition that people from this village have access to, making it one of the main reasons why health indicators in this area are quite worse than in, for instance, New Delhi.

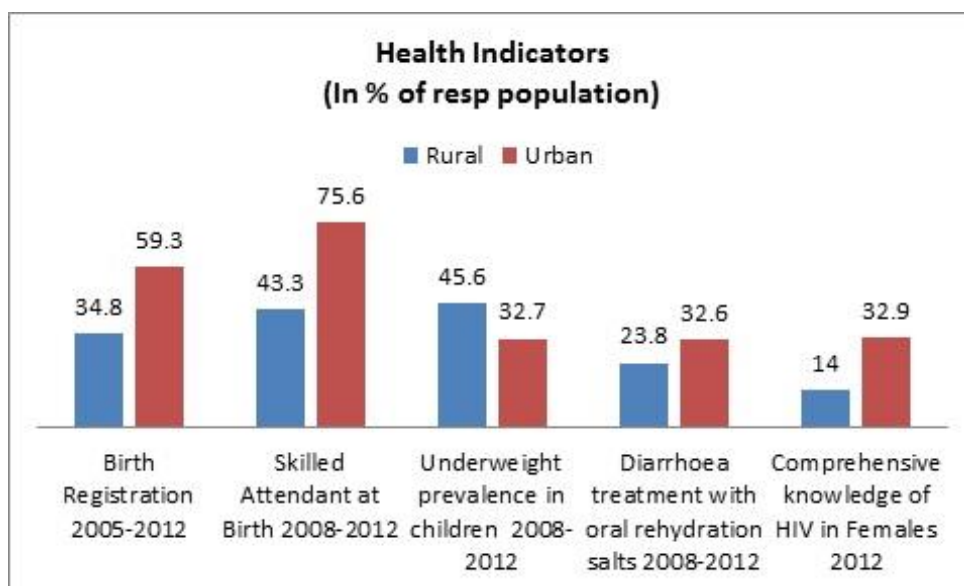


Figure 5. Comparison between rural and urban health indicators. (4)

Moreover, hospitals find great difficulty in maintaining the minimum services necessary to provide inhabitants with a quality health care system, since their electricity supply is limited and often not very reliable.

Small businesses in rural villages are greatly affected by the lack of a reliable power supply, because they cannot operate properly without access to machinery and light. The results of The Rockefeller Foundation's Smart Power project show that access to tools and machines powered by electricity allowed carpenters or tailors to significantly increase their productivity, as well as crop and dairy farmers to refrigerate their products. Consequently, they were able to sell more at markets and entrepreneurs opened new businesses boosting the local economies. As a result, local economies grew by \$18.50 per capita—accounting for an increase in economic productivity and the value of benefits to health, environment and social well-being. (22)

Finally, there is no doubt that daily life is not possible without electricity or at least some kind of lighting. Consequently, people in the village are forced to use kerosene lamps and woods. These lamps are a danger because they produce greenhouse gases such as CO₂, CO, particulate matter and increase the risk of accidents related to fire. This is in fact the case of a family living in a farm in rural India, whose hut caught fire due to an overturned kerosene lamp, resulting not only in the loss of their home but also in the death of the three children living there. (5)



2. Executive summary

More than 90% of households in the village of Fateh Nagla in Uttar Pradesh, one of the most populated yet poorest states in India, still live in the dark. They lack access to affordable and adequate electricity supply. Consequently, people have no other option than to use kerosene lamps, animal waste, charcoal, and woods for lighting and warming. This problem is preventing the development of this rural area and arouses many other issues such as low-quality education, poor agriculture, no availability of proper healthcare and emission of greenhouse gases.

ShineBright is devoted to help India become a fairer country where every citizen has the same opportunities. The first step to do so is to provide everybody access to basic services. *ShineBright* offers a solution to this serious problem by providing the electricity they need at a lower cost and therefore, making it affordable for inhabitants of Fateh Nagla. With the aim of obtaining the required electricity from a renewable source of energy, solar panel systems will be installed in households' rooftops. Since the low income of people in Fateh Nagla makes it impossible for them to afford the purchase and installation of the solar systems, these will be installed in urban areas where citizens have higher salaries and living standards. Using the existing grid in those cities and villages, the excess energy generated by the solar systems will be sold at a reduced price to the poor village citizens who will now have access to the much-needed electricity.

Located in New Delhi, *ShineBright* has two main customers that will benefit from the business. On the one hand, clients who will have solar panels installed in their roof will have a significant reduction on their monthly electric bill. Indeed, after the first year of installation they will have it for free. These people will be generating clean energy from sunlight and the excess that they do not consume will be put back into the grid. They will still be connected to the grid and will be able to use their house appliances normally. On the other hand, the surplus generated would be distributed amongst villagers of Fateh Nagla, who would have access to electricity. Thus, their quality of life will improve considerably, boosting the development of the rural areas.

The business will begin with 50 clients who have already been contacted and are willing to invest in solar panel systems for their houses. The following years, an average of 15 more clients per year are predicted to join the business. The expected life of the offered solar systems is of 25 years and with normal use, clients will be able to recover their investment with the generated energy in less than 14 years, having still 11 years of revenue from the solar panels.

It has been estimated that an initial investment of 4,000,000 Rs. will be needed, together with a bank loan of 13,000,000 Rs., to be paid in 10 years with a 5 % interest rate, in order to set the business running and buy all the needed equipment and elements for the company. At the end of four years, the business is expected to start making profit and by the end of the fourth year, the village of Fateh Nagla is predicted to be fully electrified using the excess energy from the solar panels installed in New Delhi. At this point, new villages will be contacted to expand the business.



3. Business details

3.1. Possible solutions

After having analyzed the problem and the reasons why it exists it can be concluded that our solution should meet the following requirements:

- 1) Provide electricity access to households that still do not have the service.
- 2) Provide a reliable, stable and consistent energy supply
- 3) Provide electricity at a cheaper price.
- 4) Use a clean energy source to reduce coal use and pollution

All these reasons, together with the fact that Indian government is intensively promoting electrification through renewable energy, have led us to contemplate renewable energy sources as the best option to solve power supply matter in these areas. (6) (7)

In this respect, the power generation solutions worth considering are the following:

- Wind energy:
- Photovoltaic (PV) solar energy
- Biomass and biofuel energy
- Geothermal energy
- Tidal energy
- Ocean Thermal Energy Conversion (OTEC)
- Hydro energy

3.2. Analysis and best alternative selection

Regarding hydro energy, this proposal is undoubtedly ruled out because of the more complex and expensive infrastructure that is required to produce power.

The same could be argued for geothermal energy. Even though India has a reasonably good potential for this type of renewable energy, the necessary investment in infrastructure and geothermal plant exceeds the capacity and scope of our business.

With respect to tidal and OTEC energies, it can be said that any type of renewable energy with the sea as power resource could be a great solution considering that a significant part of the country is surrounded by the Indian Ocean. However, due to the area we are focusing on for our business, which is quite far from the coast, choosing this alternative would mean incurring in additional transportation costs that would eventually raise the price of electricity.

As far as biomass is concerned, India has a high availability of this resource due to current surplus in agriculture, forestry and plantations. Besides that, climatic conditions create a good



environment for biomass production. All the same, storage plants would be needed to assure a regular supply of biomass to production plants. Storage costs are usually expensive and would imply more expensive electricity so that the investment could be recovered. (8) (9)

Wind and solar energy are more variable and intermittent, since they depend entirely on nature. Yet, the source of energy is totally free.

These being two of the most popular renewable energies, a general comparison of their main characteristics can be easily made.

PV SOLAR ENERGY	WIND ENERGY
Low maintenance	High maintenance
Long system lifespan	Long system lifespan
Relatively simple installation	Relatively simple installation
Silent and unobtrusive operation	Considerable noise generation
High project cost	High project cost
No moving parts	Moving parts eventually wear out

Table 1. Solar and wind energy comparison. (10)

Having in mind that our main goal is to provide electricity for households in this village, some of the above-mentioned features of wind power constitute important disadvantages, making this option more suitable for utility companies than for our business.

This finally leaves us with photovoltaic solar energy as the best solution to our problem. In fact, solar panels are relatively easy to install in household rooftops and are frequently used for residential purposes such as: generating electricity, heating water, and heating and cooling the house. (11)

Moreover, with an average of approximately 7.6 hours/day of sunshine during the whole year and taking into consideration that some energy can also be obtained in slightly cloudy days, it should be enough to provide a consistent supply of electricity.



Northern India

Total annual sunshine

Place	State	Hours
Allahabad	Uttar Pradesh	2774
Amritsar	Punjab	2762
Indore	Madhya Pradesh	2884
New Delhi	Delhi	2685

Table 2. Yearly average sunshine hours in Northern India. (12)

3.3. Business plan

Nowadays, no one thinks about the possibility of living without electricity but unfortunately this is not the reality in some places of the world. The main objective of this project is to improve the life quality of people from Fateh-Nagla (Uttar Pradesh, India). This is going to be done by introducing electricity at a low price so that it can be affordable to a great number of people.

It is important to notice that most people in this village have a low income per capita, making it impossible for them to afford the installation costs of a solar system at home.

Therefore, the final goal of our business will be to provide these people with electricity at a lower price, so that they will be able to pay their monthly bills. In order to do that, our company *ShineBright* will deal with production and distribution of electricity in the following way:

- 1) To overcome the problem of affordability of solar panel installation for inhabitants of Fateh Nagla, it has been decided that our company will seek for potential customers in the country's capital, New Delhi. Average per capita income in this city is higher, meaning that more people may be talked into paying to have the solar energy system installed on the roof of their house.
- 2) *ShineBright* will select the appropriate solar panel capacity analyzing consumption of the household. That home will get electricity supply from the grid when solar energy cannot be generated and there will not be needed any extra wiring. The installation of the solar panels would be carried out in the months of June to July (monsoon season), so that maximum sunlight can be utilized in one year.
- 3) Since the installed solar system's capacity is chosen according to consumption, production of solar energy should be such that there will be surplus energy production going back to the grid. The extra production will be used to distribute it to the rural area of Fateh Nagla, selling it to people at a lower rate.

3.3.1. Extra services

On the one hand, because India is still a country with roadside animals, there are sometimes monkeys that may come closer to homes. Even though the problem is not as serious as in past



years, it is still an issue that must be considered. In that sense, *ShineBright* will provide a monkey repellent that can be installed with the solar panel to prevent animal damage.

On the other hand, the company will also deal with maintenance and cleaning costs of the solar energy systems.

3.4. Business strategy

As stated in another section, *ShineBright* is concerned about the deficient power supply in rural villages across India. *ShineBright* plans to provide electricity to the villagers in Fateh Nagla by installing solar panels in New Delhi.

The business will begin after the identification and contact of 50 clients in New Delhi. These clients can afford the installation of solar panel systems in their houses and will be able to recover the investment after 14 years. According to estimations, the average New Delhi citizen consumes about 260 kWh each month and will generate more than enough energy to cover this level of consumption. (13)

In the following 10 years, we expect an average of 15 more clients per year to be added to the business. Meaning that more energy will be generated, and more villagers will have access to electricity. This will also result on a higher revenue from the sales of panels and electricity.

Once the business has proven to be profitable, *ShineBright* plans to expand the client pool in and out of New Delhi to such an extent that it will be possible to provide with cheaper electricity supply not only to Fateh Nagla village, but also many other villages that are still in the very same situation.

3.5. Value proposition

ShineBright is determined to improve Indian citizens' living conditions by making improvements regarding the availability, quality and tariffs of the electricity service. Thanks to *ShineBright* more people in Fateh Nagla village will be able to have access to affordable electricity, as well as a more consistent and stable supply.

We are not only offering this, but we are also giving people of New Delhi the opportunity to reduce their electricity bills drastically. After the first year of the solar panel installation, they will no longer have to pay for their electricity for total life span of the solar panel, since production will be greater than consumption. Considering the long service life of the solar panels, this means free electricity for life.



4. Company structure

Choosing a business structure is one of the most important decisions taken by entrepreneurs. A business cannot be successful only with a great idea and investment. A successful business also depends on the type of structure they are using. ShineBright will be established in India, and therefore the business structure selected must be one of the existing types in India.

The six founders of the company will initially operate ShineBright and the entity form of this company will be a Limited Liability Partnership (LLP). This kind of business structure is basically formed to provide limited liability to its owners. It is a corporate body and has its own existence in the eyes of the law. The act of 2008 gives LLP the freedom to manage its own affairs. To become a partner of LLP does not involve a huge lengthy complicated process, in fact it is easy to form as well as easy to become a partner. In it, partners have limited liability to the extent of capital contributed by them and they do not have to take responsibility for other partners. (14)

ShineBright will be organized as a functional structure. This type of structure divides the company into functional departments that are directed by line managers. A CEO will be chosen to direct the company. The organigram of ShineBright is as follows:

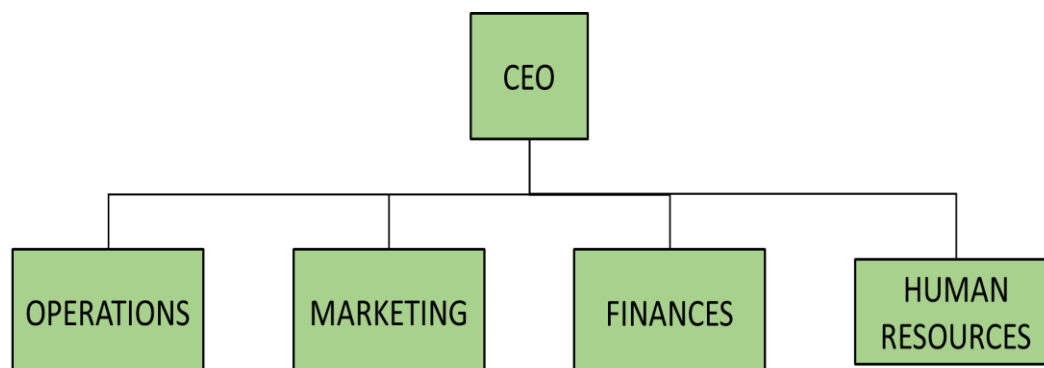


Figure 6. ShineBright company organigram

The organigram depicts different departments. The operation department will oversee the installation of the panels as well as the inventory, purchases and supplies. The marketing department will promote the business and drive sales of the products, providing the necessary research to identify target customers. The finance department will take care of the accounting and analyze the business strategy. The human resources department will oversee the hiring and training of employees. The CEO of *ShineBright* will work with the head of the departments to assure the wellbeing of the company.

Eventually, the company will work in a larger area of India. As a result, more people will be hired, and the number positions will increase, meaning that a more developed structure would be needed. Note that all these positions will be occupied at the beginning of the business by the startup team, so cost required to pay others to manage it and get paid is avoided.



5. Analysis

5.1. Product analysis

ShineBright offers a variety of on-grid solar panel systems. Different solar panel systems are offered, starting at a capacity of 1 KW up to 10 KW. The system is practically the same regardless of the electricity generating capacity. A simplified overview of the system is shown in the following figure.

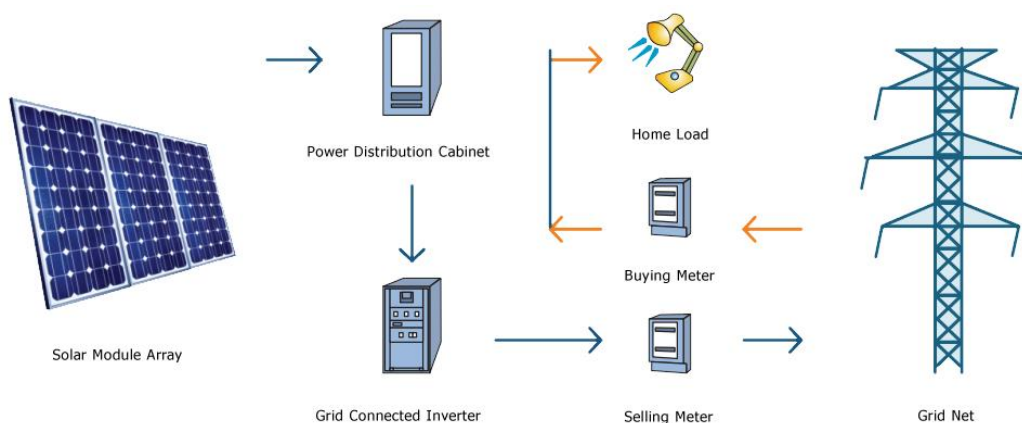


Figure 7. System overview

In Figure 7, it can be clearly differentiated the main elements of the solar panel system offered by *ShineBright*. The basic and most important element of the whole system is the photovoltaic module (PV module). The PV modules generate electricity thanks to the photovoltaic effect, a process of converting sunlight into electricity. These modules are given output ratings in watts. Combining several PV modules into arrays by wiring them allows the system to achieve the needed capacity. The PV modules need to be mounted on a fixed element to be able to maintain the required orientation.

The next element in the system is the power distribution cabinet. This element is one of the most important elements of the system. It is an electrical enclosure, which allows several PV modules to be combined in parallel. Next the inverter is installed; the inverter converts the direct current (DC) electricity from the PV modules to utility-grade alternating current that is perfectly synchronized with the utility grid.

The last elements of the system are the energy meters. The system includes two different meters, the first is used to measure the energy generated by the system and sent into the grid. The second meter measures the amount of energy consumed by the house. This way it can be measured at every moment the difference between the generated and consumed energy and the monthly bill can be calculated accordingly.



5.2. Installation

Once all the components and different parts that form an on-grid solar panel system are known, it is time to start with the installation of the solar panels on the field. There are different ways of getting this part of the job done.

The first thing that must be done is to analyze the different suppliers of all the components explained in the product analysis section. This takes us to the company Tata Power Solar. This company is going to be the supplier of all the different materials and components required to develop our solar panels.



Figure 8. Materials and components supplier. Company's logo

Tata Power Solar is a company that operates in India. It is the largest manufacturer of solar modules in the country and it perfectly fits with the goals that our company has.

The second thing that must be done is the transportation of all these components to the place where the solar panels are going to be installed. To get this part of the job done it has been chosen that the best way to do it is by renting a truck. The truck will be rented from the company Tata Trucks.



Figure 9. Truck renting company's logo

Finally, the only thing left that must be done is the proper installation of the solar panel itself. The employee(s) of the company that are hired to do that specific job will handle the installation.



5.3. Price analysis

Having all this in mind the prices of the different solar panels depending on the power required are the ones that are shown in the table below. These are prices at which *ShineBright* purchases the solar panel systems.

Capacity	Purchasing price	Selling price
1 kW	88,000 INR	123,200 INR
2 kW	155,000 INR	217,000 INR
3 kW	225,000 INR	315,000 INR
5 kW	350,000 INR	490,000 INR
6 kW	420,000 INR	588,000 INR
8 kW	520,000 INR	728,000 INR
10 kW	600,000 INR	840,000 INR

Table 3. Description of solar systems' prices (21)

The selling prices are 40 % more than the purchasing prices, because it includes transportation, of the solar system, installation on the roof and periodic maintenance.

5.4. Market analysis

5.4.1. Photovoltaic energy in India

The geographical location of India makes it a perfect place to develop the generation of solar energy. India is a tropical country that receives solar radiation throughout the year, which amount to nearly 3,000 hours of sunshine a year. Nearly every part of India receives between 4 and 7 kWh solar radiation per square meter per day. Since most of the Indian population lives in rural areas, there is a huge possibility of growth in this matter.

The solar energy generation is a fast-growing industry in India. The generation capacity of India was of 23 GW in June 2018. From which more than 2 GW were generated from rooftop solar panels. (15) Government subsidies and competitive solar panel prices make the installation of panel in rooftops an attractive idea for Indian citizens.

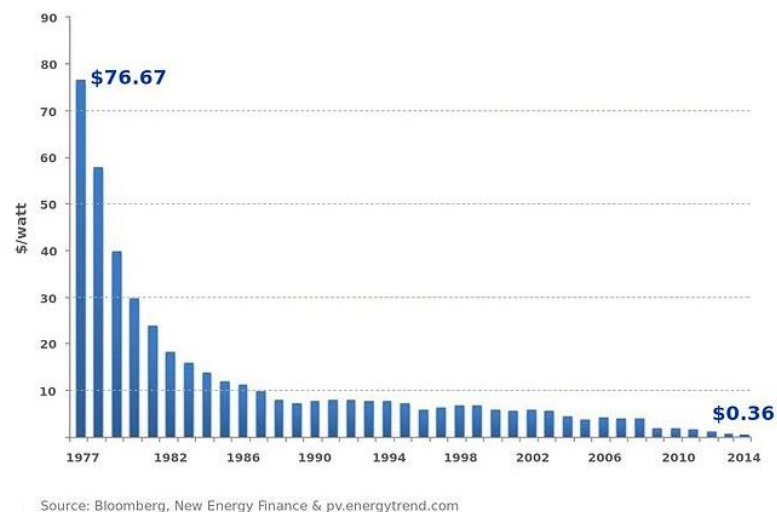


Figure 10. Solar panel price evolution from 1977 to 2014 (16)

In addition to grid-interactive solar PV energy generation, India is developing off-grid solar power for local energy needs. This will help the electrification in rural areas where the electrification levels are small. There are more than 750 MW of off-grid solar PV installed in India. This kind of installation includes a battery connected to the solar panels for auto consumption of electricity.

The use of solar panels by citizens in New Delhi will help the villagers from rural areas to have access to electricity, as the excess energy generated will be sold at a lower price to those villagers, and at the same time help them get rid of the potentially deathly dirty fuel sources. According to the Indian Ministry of New and Renewable Energy's 2015 annual report, solar products have increasingly helped to meet rural needs; during 2015, around one million solar lanterns were sold in India, reducing the need for kerosene. (17)

5.4.2. Business location

ShineBright will target potential clients in New Delhi. Since New Delhi is a big city there are many clients who can afford to invest in the installation of a solar panel system. Now 50 clients have been identified and contacted to install and benefit from the solar panel system. These customers will be generating electricity that will be put in the grid and will be transported by the electrical grid to some other place.

The main aim of the business will be to provide energy to the village of Fateh Nagla in the state of Uttar Pradesh. The electrification of this rural village is small, having access to electricity only about 15 homes out of 170 in 2017. This small electrification is not unique of this village. In fact, it is a problem in the whole state. In the following figure it is shown the potential for electrification of the state of Uttar Pradesh, where less than 50% of the households were electrified.

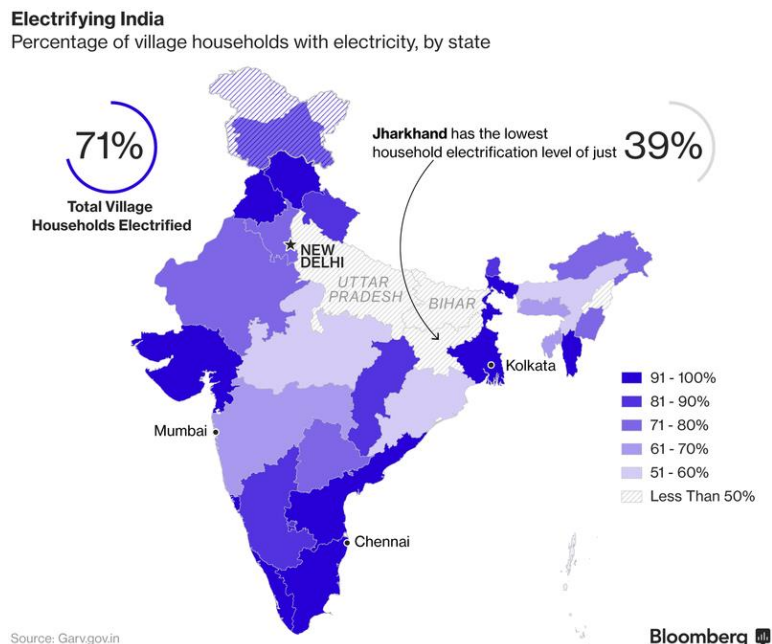


Figure 11. Map of electrification % in India (5)

Because of the small electrification of villages like Fateh Nagla, it is difficult for its citizens to overcome poverty. Electricity allows students to study and workers to work for a longer time. The first step for development is to get a functioning electric system that is available for all. Major solar panel distributors do not have the means or intentions to distribute their products on small rural villages and rely on third party distributors to do so. Our company will sell and install the solar panels in the roofs of the houses and will connect it to the existing grid.

Since small villages do not have electricity, they need to use other means to illuminate themselves in the dark. The most common way to do so is to use kerosene lamps. These lamps are a danger because they produce toxic gases and in case of an accident there could be damage to property or loss of lives.

5.4.3. Electrical grid in India

The electrical grid of Uttar Pradesh is one of the worsts of India. Lots of users are connected illegally to the grid, making electricity providers loose revenue due to electricity theft. Power supplies to rural households and farms are the biggest sources of losses in revenue collection. Rural consumers account for half the total residential consumption of power, but no more than 25% of rural households and 8% of farmers using agriculture pumps have a meter installed; in comparison, 85% of urban households do have meters. (18)

The lack of reliable power in rural areas has created an opportunity for installation of mini-grids, and many have been deployed, often with the support of domestic and international grants. In early 2016, Uttar Pradesh became the first state in India to adopt a mini-grid policy. It was also the first state in India to set-up state-sponsored mini-grid projects through competitive bidding. (19)



The main aim of the company is to be able to provide electricity to all the citizens of Fateh Nagla. For this purpose, solar panels will be installed in the roof of the houses of people who can afford to install them in New Delhi. These panels will be connected to electrical meters, so the amount of generated power will be properly measured before it is put into the grid. In the same way, when the owners of the panels use energy another electricity meter will measure the amount of energy used. The difference will be sold at a reduced price to the needy.

The excess energy produced will be then transported to Fateh Nagla and provided to people who cannot afford to pay electricity at the full cost. They will pay a lower price for the energy they use. This way, producers will lower their electricity bill and poorer families will have access to electricity by paying a price they can afford.

5.5. Competitive analysis

The Indian market is a very competitive and promising one. As a result, there are many different companies that offer solar panels for domestic use. An analysis of the competitors and the possible substitutive products is key factor to decide how to proceed with the business. It is also an effective way to understand what other companies are doing.

5.5.1. Competitors

There are many small and big solar panel distributors in the New Delhi area that could be potential threats to our business. The most significant competitors operating in New Delhi that have been identified are the followings:

- **TATA Power solar:** Tata Power Solar is India's largest integrated solar company. The main manufacturer in India.
- **Moser Baer Solar Limited:** Established in 1983 in New Delhi, Moser Baer India Ltd (MBIL) is one of India's leading technology companies. MBIL has successfully developed cutting edge technologies to become the world's second largest manufacturer of optical storage media.
- **XL ENERGY LTD:** XLE is one of India's leading end to end solution provider established in 1992 in the field of Solar Power. It is in the field of production of Solar Photovoltaic Modules. XLE has over 17 years of experience manufacturing its Solar Photovoltaic Modules and systems to various agencies in India and overseas.
- **HHV Solar:** it is one of the most reputed and trusted solar module brands in India known for its premium, high performance, reliable Crystalline silicon Solar PV Modules.

5.5.2. Substitutive products

A mayor threat for any company is the existence of products performing the same activity than the ones of the company for a lower price. There are currently no existing products or technology that



can capture sunlight and generate electricity with the same efficiency as the products that *ShineBright* distribute.

Nevertheless, there exist many other ways to produce energy that could be used instead of solar panel technology, such as diesel generators. The problem with these products is that the cost is much higher than the solar panels in the long term, and that it does not produce energy in a clean way. Since one of the problems that *ShineBright* try to address is the greenhouse gases emission by kerosene lamps, these products are not realistic substitutive products.

The closest substitutive product that currently exists in the market is concentrated solar power plans. This technology is only applicable to large solar power plants and is not effective in small case plants like the ones that need to be installed on rooftops.

5.6. SWOT analysis

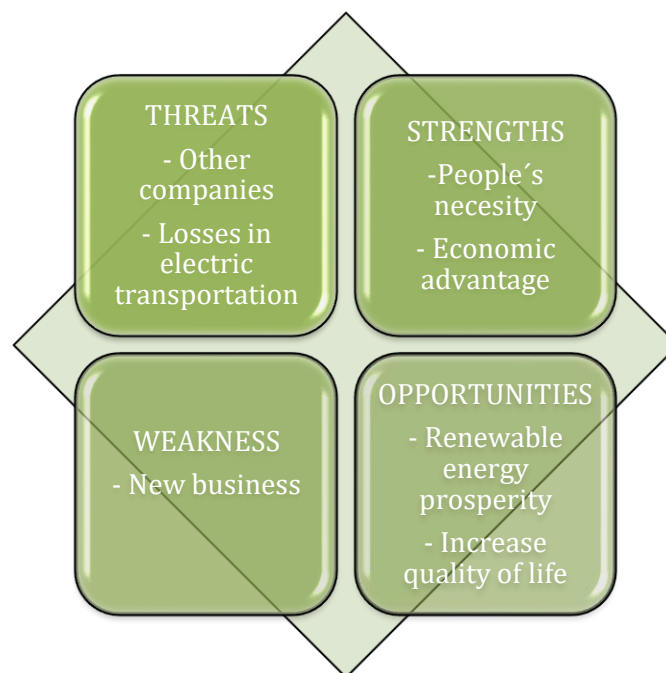


Figure 12. SWOT analysis

- **Threats:**

The main threat that will face the project is the existence of other companies in the same market trying to do something like what is being done in this business. In order to overcome this threat, it is important to make sure that the prices that are being offered are cheaper and the product has a higher quality than that of the competitors. Another major threat that the business may face is the fact that the electric grid in India is not very developed, so we may



incur in significant transportation losses. A continuous improvement in the grid system is needed to tackle this problem.

- **Strengths:**

Undoubtedly our project was born in order to solve a big problem that was detected in India. So, the main strength of the project is the necessity of people to use electricity in their lives. Apart from this, the project is also able to provide this electricity at such a lower price that will take this people to save some money that otherwise it could be almost impossible for them.

- **Weakness:**

In order to guarantee the project's success, it is important to reduce as much as possible all the weaknesses. One thing that must be done in the marketing plan is to convince the public that what the project offers is an advantage for them and instill confidence in them to dare start this new "adventure". Being a new company in the business may create uncertainty amongst clients and they might not consider *ShineBright* as a reliable company. It is important that we address clients who install the solar panels on the benefits they stand to gain on not only lower monthly bills, but also the significant savings for their investment.

- **Opportunities:**

The main opportunity that this project will gain is the possibility of promoting and developing renewable energy in such a big country as India. If people from India get conscious of the great necessity of developing renewable sources of energy, maybe this could mean a great development for the rest of the world too. Apart from this, it cannot be forgotten the great labor that this project has, which is the opportunity of changing people's lives by increasing the quality of how they live.

5.7. Marketing analysis

5.7.1. Marketing objectives

Establishing objectives helps address what the opportunities of the business are. It is important that objectives are realistic and that they are achievable. That way the scope of the business is maintained, and every person involved in the business understands what is being done.

Quantitative objectives

- **Sales:**

ShineBright predicts selling on the first year 50 solar panel systems. Following years, it is predicted to sell around 15 new solar systems to be installed in new houses. This number is expected to be maintained and even grow yearly



It is expected to sell all the excess electricity. Once a village has been totally electrified a new one will be contacted and electrified.

- **Clients:**

We will treat and maintain existing clients with dignity and respect, and then find new clients to enhance the success of our business. A good client service will be a priority to ensure all our clients are treated respectfully and made sure their needs are met.

- **Profitability:**

Profit needs to be made in order to keep the business running. Regular financial analysis must be done to decide the next steps that need to be done. If after a few years it is seen that the business makes no money, or it is not profitable, measures will be taken to shut down the company or to find new business channels.

Qualitative objectives

- **Brand image:**

It is an absolute priority that the public knows about the company and what it does. Therefore, the use of a well-functioning website and advertisement in different media is a priority. An analysis of what the clients think about our company and service must be done every time that a client is contacted, or service is given.

- **Quality of the service:**

The service provided must always be good. The workers must be trained to do so and assurance of quality by independent parties should take place periodically.

- **Innovation:**

Continuous improvement must be done to assure that the quality of the products and the service that is provided is the best that it can be. Analyzing competitors and new technologies is a good way of doing this.

- **Feedback:**

Customer response or review after communication or services with *ShineBright* will be routinely reviewed for improvement on best practice.

5.7.2. Marketing strategy

The strategy used must be one that allows the company to fulfill the established objectives. By focusing on four functional fields the strategy is analyzed.



- **Product/ service:**

ShineBright offers on-grid solar panel systems that will allow its user to get a lower cost on their monthly electrical bill. By installing these systems users will be contributing to the electrification of rural villages of India, thus helping the economic growth of the country, and at the same time help save the environment by using a renewable source of energy.

Customers will only have to purchase the system and *ShineBright* will take care of the installation and connection to the grid. The customer service will be available at any time to help clients with any problem they might have when using the systems. The maintenance that solar panels need are minimum and have a long-lasting life expectancy, making them a great option for users looking to make their bill cheaper.

- **Place:**

Every client's necessities are different and *ShineBright* goal is to offer the best option to meet those needs. In the company's office in New Delhi clients or other communication channels can talk to personnel and receive advice on the best existing option for their houses. Nevertheless, *ShineBright* also offers the possibility to buy any of the offered products using the company's website or by contacting any of the sellers on the phone.

For clients in rural villages where electrification is scarce will be able to get electric service without having to move from the village. They will just have to contact local authorities and they will be provided information.

- **Price:**

Clients who purchase the solar panel systems offered will benefit greatly as they will be able to reduce the cost of their electricity and at the same time help electrify India at a reasonable price. The investment of a solar panel system is under the existing circumstances in India (government subsidies of up to 30 % of the total cost of the installation) is a very beneficial one for the clients. The recovery of the investment is usually done in a short time period compared to the life expectancy of 25 years of the solar panel systems., because the generated energy will help lower the price of the monthly electrical bill.

- **Promotion:**

The target clients of the product and services offered by *ShineBright* are completely different. On one hand, clients in New Delhi will mostly be wealthy or middle-class citizens who can afford to invest money on a solar panel system. The promotion of the products for these clients will be done on mass media like the radio, TV and the Internet. Since most of the clients in New Delhi will use the Internet daily the biggest effort will be made there.

On the other hand, as stated before, clients in Fateh Nagla have none or little access to Internet or TV. That is way the promotion of the product will be mostly done using billboards installed in the village and with brochures that will be put in local gathering points like the



hospital or places of worship. This way people will hear about how they can benefit from the services that *ShineBright* offer. Moreover, *ShineBright* will have personnel working with the local authorities to promote the services that are available and at the same time help villagers get access to the much-needed electricity.

5.8. Risk management

In this section the different risks that the business may face are analyzed and the contention plans for each of the risk is discussed.

- **Accident on the workplace**

The installation of the solar systems is done on the rooftop of our clients' houses. Working on high buildings may be a dangerous task and someone may get hurt. *ShineBright* will train every worker on safety on the workplace and will assure that every worker follows the rules imposed to reduce the risks of accidents. In case an accident occurs, *ShineBright* has contracted an insurance to cover the costs of an accident.

- **Estimates of sales not correct**

In case the level of sales is lower than estimated will have to reconsider the objectives settled and will conduct an analysis of the case to determine the causes. If the problem is that not enough solar panel systems are being sold, then a better marketing will be done and a higher emphasis on clients will be made. In the case that not enough electricity is sold in the villages, then new villages will be contacted to increase the profit from the villagers or a price analysis will be done.

In case the volume of sales is bigger than expected, the dealer from which the solar panel systems are purchased will be contacted to deliver more units. The extra money will be invested to provide a better service.

- **Failing to deliver electricity correctly**

It might happen that the villagers do not receive electricity at their houses at some moment. The sources of problem will be analyzed to determine whether it is a problem of an individual house or it is a problem of the whole grid. In any case, the owner of the grid will be contacted to take care of the problem as soon as possible.

- **Malfunction of some solar panel system**

In case that any of the installed solar panel system under warranty malfunctions, the source of the problem will be analyzed to determine if it is a problem of wrong installation, and a correct installation will be done, or if the system itself has some problem. In case of the latter the system will be replaced with a new one.



- **System attacked by monkeys**

Monkeys are a major problem in some Indian cities. In order to avoid monkeys breaking any system, a monkey-repelling element will be delivered to maintain them away of the systems. This element consists of a small box that emits ultrasound keeping monkeys away of the noise.

5.9. Financial analysis

In this section the financial analysis of the business is done. After some research, several assumptions have been made in order to develop a realistic yet simplified prediction of the business finances.

- It will be considered that in average, households in New Delhi will consume 3120 kWh per year (260 kWh per month). Whereas, houses in Fateh Nagla will only consume 840 kWh per year (70 kWh per month). (13)
- Price of electricity will be taken according to ranges shown in table 5
- For calculations it will be considered that only solar panel systems of 2 kW are going to be installed and that system's efficiency is 90%.
- The price at what the electricity will be sold in Fateh Nagla is 2.5 Rs/kWh (more than 50% less than the real price)
- Estimation of 2685 sunlight hours in New Delhi is used to obtain production. (Table 2, section 4.2.)
- A grid efficiency of 79% is assumed to consider transportation/distribution losses.
- There is no cost of using available grid for rooftop solar panel systems. (23)

Units range (kWh)	Cost per unit (in INR)
0-150	4.90
151-300	5.40
301-500	6.20
>500	6.70

Table 4. Unit range-wise cost for electricity. (20)

To get *ShineBright* started it will be necessary a 4,000,000 Rs investment, as well as a long-term bank loan of 13,000,000 Rs. The loan will be paid in 10 years with a 5% interest rate. The money will be invested in solar panel systems, equipment, office and warehouse.



Principal (P)	Annual interest (I = P*i)	Amortization = A	Years
13,000,000	650,000	1,300,000	1
11,700,000	585,000	1,300,000	2
10,400,000	520,000	1,300,000	3
9,100,000	455,000	1,300,000	4
7,800,000	390,000	1,300,000	5
6,500,000	325,000	1,300,000	6
5,200,000	260,000	1,300,000	7
3,900,000	195,000	1,300,000	8
2,600,000	130,000	1,300,000	9
1,300,000	65,000	1,300,000	10

Table 5. Loan payments

On the first year, a total of 50 solar panel systems are to be installed in New Delhi. These systems will start generating energy from the first day and will start placing electricity into the grid. Analysing the generated energy, it is expected that every solar panel system of 2kW will produce enough excess energy, after deducting the transportation losses, to electrify some 1.61 houses. Meaning that the 50 initial systems will help 81 houses.

During the next 10 years, it is predicted that 15 new systems per year will be installed. In the 4th year enough excess electricity will be generated from the systems in order to allow almost the 155 current houses without access to electricity to gain it at an affordable price. This means that Fateh Nagla will be fully electrified by this year and new villages could start to benefit from our business.

No. of houses (1 system)	1.6	Annual increase
No. of houses End of Year 1	81	
End of Year 2	105	24
End of Year 3	129	24
End of Year 4	153	24
End of Year 5	177	24

Table 6. Number houses electrified yearly

The balance sheet and income statement show how the company is predicted to be doing at the end of each year for a 10-year period. Using the predictions and estimates, it has been calculated that *ShineBright* will start to make profit at the end of the 4th year. It is important that enough clients are found each year for these predictions to be fulfilled.



	50 panels	1 panel
Production (kWh)	241,650	4,833
Consumption urban (kWh)	156,000	3,120
Surplus electricity (kWh)	85,650	1,713
Surplus after transportation (kWh)	67,664	1,353
Sales in electricity (INR)	169,158.75	3380.00

Table 7. Electricity production and excess from solar systems

BALANCE SHEET

*All data is in INR (Indian rupees)	DAY ZERO	AUG-19	AUG-20	AUG-21	AUG-22	AUG-23	AUG-24	AUG-25	AUG-26	AUG-27	AUG-28	AUG-29
ASSET												
Inventory		7,750,000	2,325,000	2,325,000	2,325,000	2,325,000	2,325,000	2,325,000	2,325,000	2,325,000	2,325,000	2,325,000
Cash	17,000,000	4,750,000	10,125,400	8,790,100	7,604,300	6,522,520	5,530,440	4,628,060	3,815,380	3,092,400	2,459,120	1,915,540
Equipment		500,000	450,000	400,000	350,000	300,000	250,000	200,000	150,000	100,000	50,000	0
Office and Warehouse		4,000,000	3,900,000	3,800,000	3,700,000	3,600,000	3,500,000	3,400,000	3,300,000	3,200,000	3,100,000	3,000,000
TOTAL ASSETS	17,000,000	17,000,000	16,800,400	15,315,100	13,979,300	12,747,520	11,605,440	10,553,060	9,590,380	8,717,400	7,934,120	7,240,540
LIABILITY												
Long term loan	13,000,000	13,000,000	11,700,000	10,400,000	9,100,000	7,800,000	6,500,000	5,200,000	3,900,000	2,600,000	1,300,000	0
TOTAL LIABILITY	13,000,000	13,000,000	11,700,000	10,400,000	9,100,000	7,800,000	6,500,000	5,200,000	3,900,000	2,600,000	1,300,000	0
EQUITY												
Old equity		4,000,000	4,000,000	5,100,400	4,915,100	4,879,300	4,947,520	5,105,440	5,353,060	5,690,380	6,117,400	6,634,120
Net Income	0	0	1,100,400	-185,300	-35,800	68,220	157,920	247,620	337,320	427,020	516,720	606,420
TOTAL EQUITY	4,000,000	4,000,000	5,100,400	4,915,100	4,879,300	4,947,520	5,105,440	5,353,060	5,690,380	6,117,400	6,634,120	7,240,540

Table 8. Balance sheet



INCOME STATEMENT

*All data is in INR (Indian rupees)	AUG-20	AUG-21	AUG-22	AUG-23	AUG-24	AUG-25	AUG-26	AUG-27	AUG-28	AUG-29
REVENUE										
Sales in electricity	169,000	219,700	304,200	388,700	473,200	557,700	642,200	726,700	811,200	895,700
Sales in solar panel	10,850,000	3,255,000	3,255,000	3,255,000	3,255,000	3,255,000	3,255,000	3,255,000	3,255,000	3,255,000
TOTAL REVENUE	11,019,000	3,474,700	3,559,200	3,643,700	3,728,200	3,812,700	3,897,200	3,981,700	4,066,200	4,150,700
EXPENSES										
Advertising	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Web hosting and domains	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Solar panel installation and maintenance	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Transportation renting cost	50,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
Salaries	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000
Employees facilities and benefits	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
Workers' insurance	7,750,000	2,325,000	2,325,000	2,325,000	2,325,000	2,325,000	2,325,000	2,325,000	2,325,000	2,325,000
Solar panel cost	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
Equipment depreciation	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Office depreciation	650,000	585,000	520,000	455,000	390,000	325,000	260,000	195,000	130,000	65,000
Loan interest payment (5%)										
TOTAL EXPENSES	9,185,000	3,660,000	3,595,000	3,530,000	3,465,000	3,400,000	3,335,000	3,270,000	3,205,000	3,140,000
Net Income before taxes										
Corporate Tax (25%)	1,834,000	-185,300	-35,800	113,700	263,200	412,700	562,200	711,700	861,200	1,010,700
Surcharge Tax (12%)	458,500	0	0	28,425	65,800	103,175	140,550	177,925	215,300	252,675
Educational Cess (3%)	220,080	0	0	13,644	31,584	49,524	67,464	85,404	103,344	121,284
Total Tax	55,020	0	0	3,411	7,896	12,381	16,866	21,351	25,836	30,321
NET INCOME	1,100,400	-185,300	-35,800	68,220	157,920	247,620	337,320	427,020	516,720	606,420

Table 9. Income statement

5.9.1. Sensitivity analysis

As presented in the risk management section, there are some uncertainties that might make the estimated results shown above differ from reality. Therefore, three scenarios have been analyzed, best-case scenario, most probable scenario and worst-case scenario.

- **Best case scenario**

In this case it has been predicted that 25 solar panel systems are going to be sold each year and 100% of the excess energy generated (after grid losses are considered) is sold to villagers. In this scenario, the business starts making profit from year one and the profit made continues increasing from year to year.

Installing 25 solar panel systems every year means that more houses and villages can be electrified. With this number of systems 40 new houses each year can be electrified, which means that after 5 years 242 houses will have access to electricity.

The income statement and balance sheet are presented in the Appendix I.

- **Most probable scenario**

This scenario has been presented in the financial analysis. It is considered that 15 solar panel systems are installed each year and 100 % of the excess energy generated (after grid losses are considered) is sold to villagers.

The income statement and balance sheet are presented in the section 6.9.

- **Worst-case scenario**

This scenario considers that 15 solar panel systems are installed each year, but only 80 % of the excess energy generated (after grid losses are considered) is sold to villagers. In this scenario, the business starts making profit after 3 years (as in most probable scenario), and the profit value rises slowly but steadily year after year.

In this case the number of houses electrified each year is smaller because there is excess electricity that is not distributed. Each year 19 new houses are electrified and after 5 years 161 houses are electrified. This is, Fateh Nagla is electrified in 5 years.

The income statement and balance sheet are presented in the Appendix II.

	Worst-case	Most probable case	Best-case
Houses electrified/year	19	24	40
Fateh Nagla electrified	End of 5th year	End of 4th year	End of 3th year
Start making profit	End of 4th year	End of 4th year	End of 1st year
Profit after 10 years	498,300 INR	606,420 INR	998,700 INR
Equity after 10 years	6,572,100 INR	7,240,540 INR	10,859,500 INR

Table 10 Comparison of the different scenarios



6. Investors

Investors are one of the main stakeholders of the business and are the ones that will allow this business to operate. It is important to maintain a healthy relationship with them. Communication between upper management and investors will be fluid and monthly meetings will be conducted to allow them to see what is being done and how the money is being invested.

After 10 years, once the long-term loan is totally paid, the company is expected to be profitable. It will continue generating income yearly. In this moment, it will be decided whether the company is sold to a third party or it continues operating.

If it is decided that the best option is to sell the company, *ShineBright* will try to find a company or investor that continues with the business. For *ShineBright* is very important to find more people committed to make India a better place for everyone, and the first step is to provide electricity to all. The received money will be divided accordingly to the quantity invested by the investors.

In case that *ShineBright* continues operating, investors will get a percentage of the annual profit, according to the capital invested to get the business started. It must be understood that the profit made yearly will not be very big and because of the nature of the company, investors should not expect to make great amount of money when embracing this endeavor. As stated, the final goal is to make a fairer India where everybody has the same opportunities. The investors that decide to help us should take this into account.



7. Conclusion and recommendations

Even though the main goal of a business is to obtain revenues and make profit, our company is driven to go beyond that. It is high time that the enduring lack of rural electrification in India is ended. With the vision of solving this problem, regardless of its difficulty, ShineBright will work to be the company that gives hope to Indians by providing a clean and efficient energy supply.

In this sense, *ShineBright's* mission is to produce and deliver electricity to the people of Fateh Nagla village in an environmentally friendly way. This is the reason why solar panels will be installed in houses in New Delhi. This will be beneficial for two different customers. Indeed, it will improve not only rural inhabitant's quality of life, but also urban citizen's electricity bills.

On the one hand, people of Fateh Nagla will get adequate power supply at half the market price, so it will be easier for them to afford it. On the other hand, customers installing solar panels in New Delhi will get their electricity bills free by the end of 1st year and by the end of the 14th year they will reach the breakeven point of their investment in the solar system.

A full analysis of our business has been made in order to find out whether it is feasible or not. First, we can conclude that market opportunities for our business are extensive, since there are more villages in a situation like Fateh Nagla's. Secondly, after product and financial analysis, it has been determined that with an initial installation of 50 panels and a subsequent annual installation of 15 panels, *ShineBright* will overcome the initial losses and make profit after the third year. Finally, this means that at this installation rate, by the fifth year, we will be able to provide electricity not only to Fateh Nagla, but also to other rural villages.

Taking all this data into consideration, together with the possible risks the business may face, we believe change is possible and so we encourage everyone that is committed to the cause to participate in the initial investment needed to start this worthy business.

There is reason to believe that *ShineBright* will be capable of growing internally as well as externally, as more people is aware and conscious of the importance of the company's purpose.



8. References

1. *Forbes*. <https://www.forbes.com/sites/suparnadutt/2018/05/07/modi-announces-100-village-electrification-but-31-million-homes-are-still-in-the-dark/#286d1e5a63ba>.
2. *CEIC Data*. <https://www.ceicdata.com/en/india/electricity-demand-and-supply>.
3. *Hindustantimes*. <https://www.hindustantimes.com/lucknow/up-lags-in-power-supply-again-demand-supply-gap-widens/story-SY6UwAUGIKBEwOqZH2sb2M.html>.
4. *Factly*. <https://factly.in/rural-india-behind-urban-india-in-progress-indicators/>.
5. *Bloomberg*. <https://www.bloomberg.com/news/features/2017-01-24/living-in-the-dark-240-million-indians-have-no-electricity>.
6. *CNN Business*. <https://money.cnn.com/2018/04/30/news/india/india-electricity-villages-modi/index.html>.
7. *Livemint*. <https://www.livemint.com/Opinion/nrgFBVsILzEtbJf7pwfH3H/The-problem-of-lack-of-rural-electricity-demand.html>.
8. *BioEnergy Consult*. <https://www.bioenergyconsult.com/tag/how-is-biomass-stored/>.
9. *Indian Power Sector*. <http://indianpowersector.com/home/renewable-energy/>.
10. *Slideshare*. <https://es.slideshare.net/ezysolare/comparison-between-different-types-of-renewable-energy-sources>.
11. *Energy Sage*. <https://news.energysage.com/renewable-energy-resources-explained/>.
12. *Current Results*. <https://www.currentresults.com/Weather/India/annual-sunshine.php>.
13. *CPR India*. <http://cprindia.org/news/6519>.
14. *Legalraasta*. <https://www.legalraasta.com/business-structures/>.
15. *Ministry of New and Renewable Energies*. <https://mnre.gov.in/physical-progress-achievements>.
16. *Wikimedia*.
https://commons.wikimedia.org/wiki/File:Price_history_of_silicon_PV_cells_since_1977.svg.
17. *Ministry of New and Renewable Energies*. <https://mnre.gov.in/annual-report>.
18. *Atimes*. <http://www.atimes.com/article/power-plays-suck-energy-from-uttar-pradesh-electricity-grid/>.
19. *Global climate scope*. <http://global-climatescope.org/en/country/india/uttar-pradesh/#/enabling-framework>.



20. *Times of India*. <https://timesofindia.indiatimes.com/city/lucknow/now-brace-for-hiked-power-tariff/articleshow/61857879.cms>.
21. *Solar Energy Panels (India)*. <https://solarenergypanels.in/solar-power-plants/1kw-2kw-5kw-10kw-on-grid-solar-power-plants>.
22. *Rockefeller foundation*. <https://www.rockefellerfoundation.org/our-work/initiatives/smart-power-for-rural-development/>.
23. *Ministry of New and Renewable Energies*: "Off-grid & Decentralized Solar Applications" Scheme, "Grid-Connected Rooftop and Small Solar Power Plants Programme" Guideline.

APPENDIXES

APPENDIX I: Best-case scenario

BALANCE SHEET

*All data is in INR (Indian rupees)	DAY ZERO	AUG-19	AUG-20	AUG-21	AUG-22	AUG-23	AUG-24	AUG-25	AUG-26	AUG-27	AUG-28	AUG-29
ASSET												
Inventory		7,750,000	3,875,000	3,875,000	3,875,000	3,875,000	3,875,000	3,875,000	3,875,000	3,875,000	3,875,000	3,875,000
Cash	17,000,000	4,750,000	8,575,400	7,706,500	6,927,300	6,237,800	5,638,000	5,127,900	4,707,500	4,376,800	4,135,800	3,984,500
Equipment		500,000	450,000	400,000	350,000	300,000	250,000	200,000	150,000	100,000	50,000	0
Office and Warehouse		4,000,000	3,900,000	3,800,000	3,700,000	3,600,000	3,500,000	3,400,000	3,300,000	3,200,000	3,100,000	3,000,000
TOTAL ASSETS	17,000,000	17,000,000	16,800,400	15,781,500	14,852,300	14,012,800	13,263,000	12,602,900	12,032,500	11,551,800	11,160,800	10,859,500
LIABILITY												
Long term loan	13,000,000	13,000,000	11,700,000	10,400,000	9,100,000	7,800,000	6,500,000	5,200,000	3,900,000	2,600,000	1,300,000	0
TOTAL LIABILITY	13,000,000	13,000,000	11,700,000	10,400,000	9,100,000	7,800,000	6,500,000	5,200,000	3,900,000	2,600,000	1,300,000	0
EQUITY												
Old equity		4,000,000	4,000,000	5,100,400	5,381,500	5,752,300	6,212,800	6,763,000	7,402,900	8,132,500	8,951,800	9,860,800
Net Income	0	0	1,100,400	281,100	370,800	460,500	550,200	639,900	729,600	819,300	909,000	998,700
TOTAL EQUITY	4,000,000	4,000,000	5,100,400	5,381,500	5,752,300	6,212,800	6,763,000	7,402,900	8,132,500	8,951,800	9,860,800	10,859,500

Table 11. Best-case scenario balance sheet



INCOME STATEMENT

*All data is in INR (Indian rupees)	AUG-20	AUG-21	AUG-22	AUG-23	AUG-24	AUG-25	AUG-26	AUG-27	AUG-28	AUG-29
REVENUE										
Sales in electricity	169,000	253,500	338,000	422,500	507,000	591,500	676,000	760,500	845,000	929,500
Sales in solar panel	10,850,000	5,425,000	5,425,000	5,425,000	5,425,000	5,425,000	5,425,000	5,425,000	5,425,000	5,425,000
TOTAL REVENUE	11,019,000	5,678,500	5,763,000	5,847,500	5,932,000	6,016,500	6,101,000	6,185,500	6,270,000	6,354,500
EXPENSES										
Advertising	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Web hosting and domains	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Solar panel installation and maintenance	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Transportation renting cost	50,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
Salaries	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000
Employees facilities and benefits	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
Workers' insurance	7,750,000	3,875,000	3,875,000	3,875,000	3,875,000	3,875,000	3,875,000	3,875,000	3,875,000	3,875,000
Solar panel cost	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
Equipment depreciation	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Office depreciation	650,000	585,000	520,000	455,000	390,000	325,000	260,000	195,000	130,000	65,000
Loan interest payment (5%)										
TOTAL EXPENSES	9,185,000	5,210,000	5,145,000	5,080,000	5,015,000	4,950,000	4,885,000	4,820,000	4,755,000	4,690,000
Net Income before taxes										
Corporate Tax (25%)	1,834,000	468,500	618,000	767,500	917,000	1,066,500	1,216,000	1,365,500	1,515,000	1,664,500
Surcharge Tax (12%)	458,500	117,125	154,500	191,875	229,250	266,625	304,000	341,375	378,750	416,125
Educational Cess (3%)	220,080	56,220	74,160	92,100	110,040	127,980	145,920	163,860	181,800	199,740
Total Tax	55,020	14,055	18,540	23,025	27,510	31,995	36,480	40,965	45,450	49,935
NET INCOME	1,100,400	281,100	370,800	460,500	550,200	639,900	729,600	819,300	909,000	998,700

Table 12. Best-case scenario income statement



APPENDIX II: Worst-case scenario

BALANCE SHEET

*All data is in INR (Indian rupees)		DAY ZERO	AUG-19	AUG-20	AUG-21	AUG-22	AUG-23	AUG-24	AUG-25	AUG-26	AUG-27	AUG-28	AUG-29
ASSET													
Inventory		7,750,000	2,325,000	2,325,000	2,325,000	2,325,000	2,325,000	2,325,000	2,325,000	2,325,000	2,325,000	2,325,000	2,325,000
Cash	17,000,000	4,750,000	10,105,000	8,725,500	7,478,500	6,349,800	5,300,600	4,330,900	3,440,700	2,630,000	1,898,800	1,247,100	
Equipment		500,000	450,000	400,000	350,000	300,000	250,000	200,000	150,000	100,000	50,000	0	
Office and Warehouse		4,000,000	3,900,000	3,800,000	3,700,000	3,600,000	3,500,000	3,400,000	3,300,000	3,200,000	3,100,000	3,000,000	
TOTAL ASSETS	17,000,000	17,000,000	16,780,000	15,250,500	13,853,500	12,574,800	11,375,600	10,255,900	9,215,700	8,255,000	7,373,800	6,572,100	
LIABILITY													
Long term loan	13,000,000	13,000,000	11,700,000	10,400,000	9,100,000	7,800,000	6,500,000	5,200,000	3,900,000	2,600,000	1,300,000	0	
TOTAL LIABILITY	13,000,000	13,000,000	11,700,000	10,400,000	9,100,000	7,800,000	6,500,000	5,200,000	3,900,000	2,600,000	1,300,000	0	
EQUITY													
Old equity		4,000,000	4,000,000	5,080,000	4,850,500	4,753,500	4,774,800	4,875,600	5,055,900	5,315,700	5,655,000	6,073,800	
Net Income	0	0	1,080,000	-229,500	-97,000	21,300	100,800	180,300	259,800	339,300	418,800	498,300	
TOTAL EQUITY	4,000,000	4,000,000	5,080,000	4,850,500	4,753,500	4,774,800	4,875,600	5,055,900	5,315,700	5,655,000	6,073,800	6,572,100	

Table 13. Worst-case scenario balance sheet



INCOME STATEMENT

*All data is in INR (Indian rupees)	AUG-20	AUG-21	AUG-22	AUG-23	AUG-24	AUG-25	AUG-26	AUG-27	AUG-28	AUG-29
REVENUE										
Sales in electricity	135,000	175,500	243,000	310,500	378,000	445,500	513,000	580,500	648,000	715,500
Sales in solar panel	10,850,000	3,255,000	3,255,000	3,255,000	3,255,000	3,255,000	3,255,000	3,255,000	3,255,000	3,255,000
TOTAL REVENUE	10,985,000	3,430,500	3,498,000	3,565,500	3,633,000	3,700,500	3,768,000	3,835,500	3,903,000	3,970,500
EXPENSES										
Advertising	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Web hosting and domains	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Solar panel installation and maintenance	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Transportation renting cost	50,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
Salaries	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000
Employees facilities and benefits	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
Workers' insurance	7,750,000	2,325,000	2,325,000	2,325,000	2,325,000	2,325,000	2,325,000	2,325,000	2,325,000	2,325,000
Solar panel cost	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
Equipment depreciation	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Office depreciation	650,000	585,000	520,000	455,000	390,000	325,000	260,000	195,000	130,000	65,000
Loan interest payment (5%)										
TOTAL EXPENSES	9,185,000	3,660,000	3,595,000	3,530,000	3,465,000	3,400,000	3,335,000	3,270,000	3,205,000	3,140,000
Net Income before taxes	1,800,000	-229,500	-97,000	35,500	168,000	300,500	433,000	565,500	698,000	830,500
Corporate Tax (25%)	450,000	0	0	8,875	42,000	75,125	108,250	141,375	174,500	207,625
Surcharge Tax (12%)	216,000	0	0	4,260	20,160	36,060	51,960	67,860	83,760	99,660
Educational Cess (3%)	54,000	0	0	1,065	5,040	9,015	12,990	16,965	20,940	24,915
Total Tax	720,000	0	0	14,200	67,200	120,200	173,200	226,200	279,200	332,200
NET INCOME	1,080,000	-229,500	-97,000	21,300	100,800	180,300	259,800	339,300	418,800	498,300

Table 14. Worst-case scenario income statement