

Internship Report

A Study on

Management of Global Opportunities Private Limited (MGO)

“Photovoltaic (PV) Solar Systems : Green Energy for Urban Bangladesh”



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Subject: Submission of Internship Report

Dear Madam,

I gladly present to you my Internship Report titled **“Photovoltaic Solar Systems:Green Energy for Urban Bangladesh”-A Study on Management of Global Opportunities (MGO).**

I finished my internship program in the Marketing department of Management of Global Opportunities Private Limited (MGO), 13/A/2, Kamal Ataturk Avenue, Gulshan-2, Dhaka, under your prudent supervision.

I believe the knowledge and experience I gathered during the internship period will be extremely helpful in my future professional life. I will be grateful to you if you accept the report.

Your support in this regard will be highly appreciated.

Thanking you.

Umme Habiba Farhabi

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Executive Summary

This internship report is based on the twelve weeks long internship program that I have successfully completed in Management of Global Opportunities Private Limited (MGO) under Marketing Division from 19th February, 2012 to 18th May, 2012. It is a requirement for the BBA program in BRAC University. I worked in the Marketing Division of MGO Pvt. Ltd. as a Marketing Executive. MGO Pvt. Ltd. is a new company in Bangladesh. I mainly worked in Information and Data collection from the solar market and I have participated in their market visit related activities. My faculty advisor and the on-site supervisor helped me choose the topic- **“Photovoltaic Solar Systems : Green Energy for Urban Bangladesh”- A Study on Management of Global Opportunities (MGO).** Now a day, renewable solar energy systems became a very important issue for Bangladesh Government. In order to meet our high demand for continuous electricity Bangladesh Government gave more emphasis on solar energy. That is why; the value of the knowledge attracted me the most.

IRCI Spa was established in the 1976. From the last 36 years they are working in the renewable energy sector at any levels. They have this long experience, the highly skilled staff, the full service design, technical, consulting, installation, marketing, certification and assistance in addition to proof of qualification for their customers. From February, 2012 IRCI Spa has been started their business in Bangladesh. Now they are doing their business with their Bangladeshi local partner and started their joint venture business under the name Management of Global Opportunities Private Limited (MGO). MGO Pvt. Ltd. is making partnership with international companies for the same purpose and issues. MGO has developed a joint venture with an Italian company IRCI Spa, with the intent to improve clean and safe environment in Bangladesh. Their goal is to spread green energy to reduce the energy gap in the Bangladesh. MGO Pvt. Ltd. is able to create any type of installations, according with the needs of their clients and customers by assisting the customer during every step of work with particular attention to energy saving and comfort. They use different types of products suitable for every need following with meticulously attentions any particular during the realizations of the work in the best way. They do Civil Installations in four categories that are - Tertiary, Commercial, Residential, Hospital and Industrial Installations. MGO Pvt. Ltd. is ready to do- Photovoltaic(PV) Systems, Thermal

panels, Power stations and Wind-systems. MGO Pvt. Ltd. provides energy consulting with particular focus on the choice of installations. MGO Pvt. Ltd. has been started its marketing activities from February, 2012. They are doing their marketing activities in order to identify their actual and potential customer from the existing market. MGO Pvt. Ltd. followed Geographic segmentation process to segment the solar systems market. They have selected Dhaka city as their main concern area and they segmented their market into ten region they are- Gulshan, Banani, Mirpur, Uttara, Baada and Rampura,, Dhanmondi, Mohammadpur, Malibagh, Motijheel, Old Dhaka. For now, the main target customers of MGO Pvt. Ltd. are the Real Estate companies. They are focusing on the real estate companies situated in Dhaka City.

Bangladesh experiences unmanageable gap between supply and demand of electricity especially in summer. As a major consumer of electricity, urban households can use solar energy as an alternative source not only to get rid of everyday load shedding miseries but also to reduce the power shortage. But the use of solar energy in urban area is yet not very popular. Solar energy is best known for lighting rural households of Bangladesh where electricity has not yet reached. Bangladesh has very few potential locations for hydroelectric project. Wind and Ocean tide energy can be the sources, but the exact potential is not clearly known due to lack of study and relevant information. So the solar energy is the ultimate suitable form of renewable energy for urban region because of availability of plenty of sunshine. Solar energy refers primarily to the use of solar radiation for practical ends. Solar energy can be used in different field and applications. It needs specific features and it can run from few watt (W) to plenty megawatts (MW) and even more. Renewable energy contributes about 40% of the primary energy consumption in the country, mainly through biomass, e.g. agricultural residues contribute almost half the national total, with cow dung, bagasse and fuel wood making up the rest. Those are providing poor quality cooking and lighting fuels. Developing renewable energy access can address the electrification problem of rural and isolated areas. At present the power demand in Bangladesh is about 5500MW, whereas the generation ranges only 3200- 4000MW. The generation capacity is 4300MW. But peak demand is estimated to exceed 5,000 MW. As a result of power shortage causes excessive load shading. Bangladesh relies heavily on fossil fuels for its energy especially on gas resources.

During this internship period I used to work in the Marketing Department of MGO Pvt. Ltd. I had some responsibilities related to marketing activities. As a marketing executive of MGO Pvt. Ltd., I performed some marketing activities and market related responsibilities such as preparing database, preparing list of our customers, take appointment for visit clients corporate offices, discuss our products, services, and price, visit ongoing construction projects, buildings, commercial complexes, shopping mall, apartments etc., conduct meeting with clients, preparing reports on the meeting results, etc.. With the technical team of MGO Pvt. Ltd., I worked on some technical tasks such as- taking measurement for the solar systems for a specific commercial building etc. MGO Pvt. Ltd. started their business in Bangladesh from February, 2012. They are very new in this country. They started their marketing activities from March, 2012. Their target market is the real estate companies. So as a marketing executive my first task was to collect as much information as possible about the real estate companies. The entire internship program was divided into main two parts. The first month I had to attend a training session. Every day from 10:00am to 1:00pm I had to attend training class then I had to start work with database. I was given a target of visit at least five real estate companies in one day within same location. The entire Dhanmondi zone including Mirpur Road and Panthapath was under my control. I have visited 20 Real Estate companies in total. On daily basis I was given a target to visit at least three to five potential customers from the market I had to go their corporate offices to talk with the Managing Director, sometimes I went to their ongoing projects to talk with the project manager, electric engineer, and project supervisor. For the first one week I did market visits or field works individually then next three weeks I did team work. First three weeks of my team work I moved with our engineer Mr. Sanawas Babu in the market.

From the middle of April, 2012, I did my marketing activities under direct supervision of our C.E.O. Mr. Dr. Francesco Silvestre. After observing the entire activities of MGO Pvt. Ltd., I found some problematic facts about some of their activities. All these facts can be considered as problems or criticisms. There are some responsibilities and duties where MGO Pvt. Ltd. faces problems. Besides, some responsibilities have no problem to perform. Based on these critical observations, some recommendations are given. There is serious lack of proper campaign and branding to popularize the solar energy in Urban Bangladesh. Solar energy can be a complimentary environment friendly source of power and can play a significant role in reducing

current urban power crisis. Government and Private sector should work hand in hand to harness the immense potential of solar energy of Bangladesh.

Chapter 1

1.1 Origin of The Report

Bachelor in Business Administration (BBA) is a comprehensive professional course designed to make professionals with better business and administrative knowledge. After studying and completing the relevant courses successfully, there is a provision to go through internship in an organization. An important phase of BBA program is Internship, where student experiences the real scenario, gets the opportunity to learn about the real professional world and compare the events with whatever they have learnt so far. As a business student, one must be acquainted with the conceptual and practical knowledge of business. Thus, it is an important responsibility of the concerned business school to arrange for the pupils to get the essence of professionalism. As a part of this activity, BRAC Business School had been successfully placing their students to different professionally renowned organizations to give the respective students the orientation of the real life corporate environment.

Internship Program of BRAC Business School is a under graduation requirement for the BBA students. This report is a partial requirement to fulfill the Internship program of BBA curriculum at the BRAC Business School. Assigned by the institutional supervisor, this report is prepared for internship based on the concepts learnt in Managing Global Opportunities Private Limited (MGO) related to renewable energy and technological system industry.

As per the concurrent demand of the organization, the project assignment was set by the organizational supervisor **Dr. Francesco Silvestre**, CEO and **Cristian Glorioso**, Company Secretary of Management of Global Opportunities Private Limited (MGO). The project was duly approved by the internship supervisor **Kohinur Akhter**, Senior Lecturer, BRAC Business School, BRAC University. The topic of the Internship Report is **“Photovoltaic (PV) Solar Systems: Green Energy for Urban Bangladesh”- A Study on Management of Global Opportunities Privet Limited (MGO).**

1.2. Purpose of the Study

The internship program and the report have following purposes:

- To have a detail knowledge about on-the-job responsibility.
- To experience the real business world.
- To become part of a project which helps to apply and utilize the knowledge in future profession.
- To compare the real scenario with the lessons and courses learned at BRAC Business School, BRAC University.
- To fulfill the partial requirement of BBA Program.

1.3 Objective of the Study

- **Main Objective**

To make a thorough analysis on how Renewable Energy Systems (Photovoltaic Solar System) and Technologies can help us to meet our electricity demand.

- **Specific Objectives**

- To find out the current and potential market of Management of Global Opportunities Private Limited (MGO).
- To find out distinctive product and services provided by Management of Global Opportunities Private Limited (MGO).
- To study the opportunities and impediments of renewable energy, especially solar energy systems.
- To find out favorable solutions for the problems and appropriate strategies for expansion of the business.

1.4 Scope of the Study

Here I considered that renewable power and energy sector and related industry are a blooming sector which has much potentiality to expand. This industry is not sophisticated yet due to the absence of a proper framework. From this study we can learn how renewable energy, technology, systems and consultancy is made and what are the prospects and problems at present and what are the guidelines for solving the problems, meet the demand of electricity, and expanding the business. In this report, I have given more emphasis on the potential of Photovoltaic Solar Systems (PV) and Technologies in urban Bangladesh.

1.5 Methodology

The methodology includes the methods, procedures, and techniques used to collect and analyze information. The methods that we have used in preparing this report were effective methods that helped us in conducting the research and analyzing the data that we have collected.

In this report there are uses of two types of data. These are as below:

➤ **Primary Data:**

- Data and information I have collected from my personal experiences.
- From the training session on Technical specification and Marketing.
- From the marketing activities.
- I have collected information while visiting corporate offices and ongoing construction projects of different real estates.
- Personal experience gained by visiting DESCO and DESA offices.

➤ **Secondary Data:**

- Internet
- Corporate website of IRCI SPA and Management of Global Opportunities Private Limited (MGO).
- Google
- Wikipedia
- From different articles.

1.6 Limitations

The problems, which are encountered in preparing the paper, are as follows:

- In spite of sincere efforts due to time constraint, it was not possible to make an in-depth analysis of the topic.
- Absence of reliable documents on Renewable Solar energy and Systems related to Bangladesh market practice as they have started their business from February 2012.
- Too much business of the concerned professional who were expected to be interviewed.

Chapter 2

2.1 Company Profile

IRCI Spa was established in the 1976. From the last 36 years they are working in the renewable energy sector at any levels. They have this long experience, highly skilled staff, full service design, technical, consulting, installation, marketing, certification and assistance in addition to proof of qualification for their customers in order to led IRCI Spa to be one of the best companies in the field of renewable energy sector. They have high knowledge of plant types and continuous technical and technological updating. IRCI Spa provides energy consulting with particular focus on the choice of installations, on how to optimize and in terms of consumption, air-conditioning, hot water production and the generation of heat and or driving force for develops production processes.

From February, 2012 IRCI Spa has been started their business in Bangladesh. Now they are doing their business with their Bangladeshi local partner and started their joint venture business under the name Management of Global Opportunities Private Limited (MGO).

MGO Pvt. Ltd. is making partnership with international companies for the same purpose and issues. MGO Pvt. Ltd. is Directed Mr. Gabriele Soprani, Global Consultant, Dr. Francesco Silvestre, CEO, and Supported by Md.GolamChandanSarwar, Chairman. MGO has developed a joint venture with an Italian company IRCI Spa, with the intent to improve clean and safe environment in Bangladesh. Their goal is to spread green energy to reduce the energy gap in the Bangladesh. With their highly qualified team, specialized in the management of commercial strategies, development of business plans, analysis of economic and financial flows, planning and engineering, is based mainly of financial analysts, engineers, technical professionals, lawyers, architects, mathematicians, economists they are started to spread their business around the world.

MGO Pvt. Ltd. has direct and constant collaboration with some of the most Advanced European Companies and Research Centers, improves the potential of resources of Europe Team by ensuring a constant higher support and managing and guarantees an effective action.

2.2 Vision and Mission for the Future

2.2.1. Mission Statement of MGO Pvt. Ltd.

The main objectives of MGO Pvt. Ltd. are given below:

- Increase accessibility of energy for the population in the rural areas, where the energy is not served by grids or because of the location through SHS (Solar Home System).
- Improve the standard of living and increasing of solar energy and wind.
- Improve the energy contribution through installation of wind turbines off shore.
- Explore the potential of other kind of renewable energy like: micro water, power of tides, biomass and biodiesel to satisfy the energetic demand of the rural population and to explore the electric potential generate by waste.

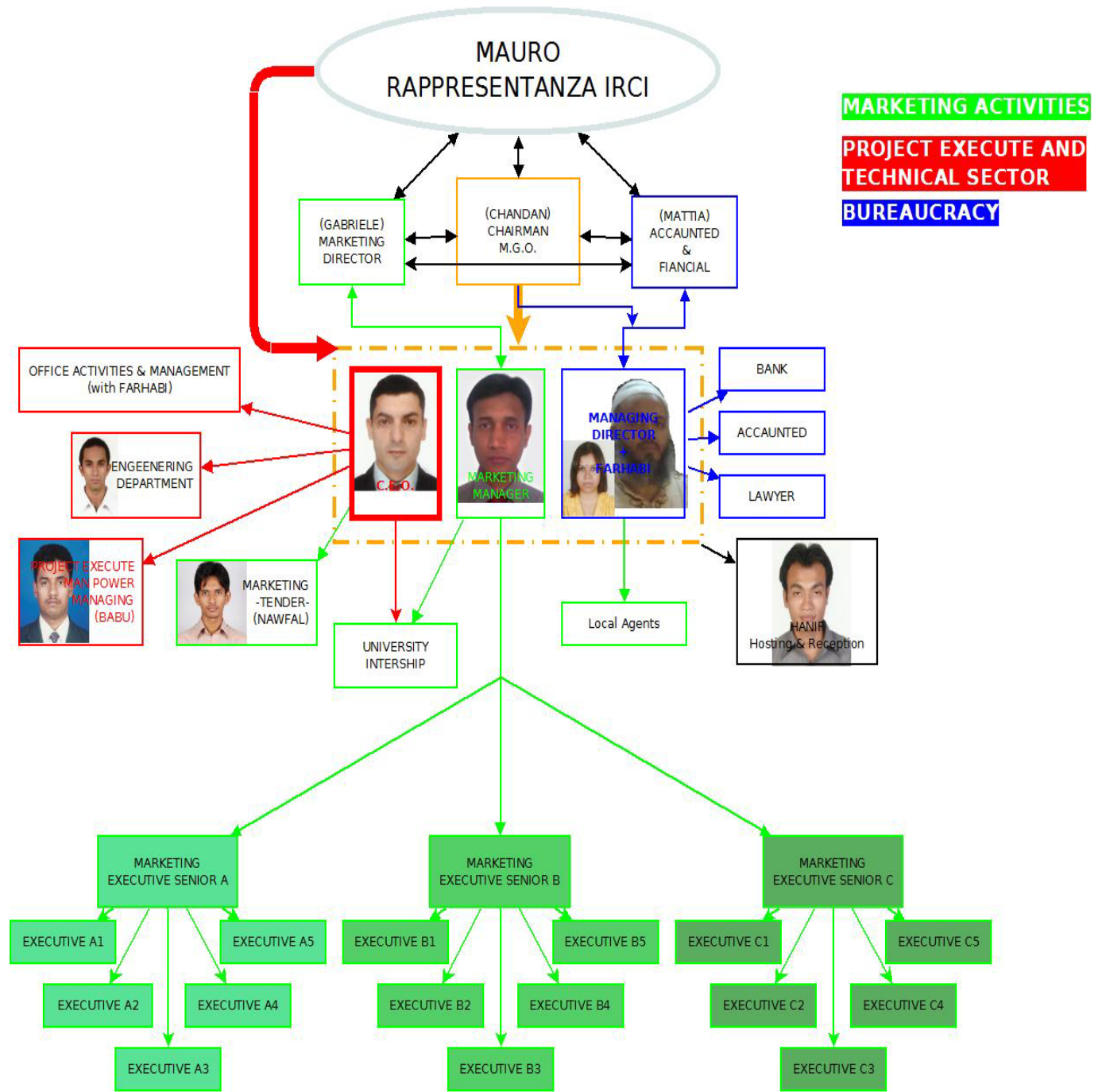
2.2.2. Vision Statement of MGO Pvt. Ltd.

The vision of Management of Global Opportunities Private Limited (MGO) is to become the leader in Technologies importation and application in Bangladesh. Bangladesh is a developing country they give their tools to the local companies to improve their result, they are offering all kind of technical support.

MGO Pvt. Ltd. has connections with hi-tech Italian company that ensure the possibilities and the opportunities to bring the high quality in many different levels about: Solar panel, accumulator, Energy saving house, and many more. They mainly believe in - **“Success will be guaranteed”**

MGO Pvt. Ltd. care about the environment and they are supporting their business in according with the world's standard, in this direction they are planning to improve profit, they are working harder so that their quality of work will increase day by day. To achieve this result they are offering the best quality product and services, best technical support from specialists to their customers. Their goal is to make Bangladesh a competitive country and look forward.

2.3. Organizational Hierarchy of MGO Pvt. Ltd.



2.4. Market Overview

Renewable Sources are the energy future of the humanity. We all can define renewable energy, a kind of energy generated from sources which by their intrinsic feature of regeneration are not exhausted in the scale of human time. The use of the sources does not affect the natural resources for future generations. Nature provides for us different types of renewable energies such as –sun, wind, rain, tides and geothermal. Solar Home System (SHS) are increasing in Bangladesh market day by day and like popularity, beside is growing the idea to use Photovoltaic (PV) plants and wind systems.

Energy is one of the fundamental factors to alleviate poverty and to start up an economic development. In the year 2000, February, the Government of Bangladesh drafted energy statute with the goal to include all the Bangladesh needs concerning energy until the year 2020, following the article number 16 of the Popular Republic Bangladesh Constitution, to remove the iniquity of quality life from the rural area to the urban area through the electrification of the rural areas.

2.5 Product and Services of MGO Pvt. Ltd.

MGO Pvt. Ltd. is distinguished since long time for plant solutions calibrated to the type of construction, about advanced technologies, and short time of accomplishment. They are able to create any type of installations, according with the needs of their clients and customers by assisting the customer during every step of work with particular attention to energy saving and comfort. They use different types of products suitable for every need following with meticulously attentions any particular during the realizations of the work in the best way.

- **Civil Installations: Tertiary, Commercial, Residential, Hospital**
- **Conditioner and heating systems:** MGO Pvt. Ltd. provides heating and cooling units for the environment air conditioning and productions uses ran by any kind of combustible.

- **Ventilation:** They assemble and install air-canalizations net of any typologies and relative split systems.
- **Air Conditioning:** Their long and strong experiences make them able to realize air treatment units for the environmental air conditioning.
- **Water and signification:** They have dark water systems with extreme meticulousness concerning installation and arrangement of the bathroom furniture, porcelain and taps.
- **Radiant panel systems:** Duringlast 20 years they have promoted radiator technology systems, they install floor, ceiling and wall heating and refrigeration environmental systems
- **Dust vacuum:** Indispensable complement of modern equipment, for a perfect and efficient system in every room of a house.
- **Water Treatment:** They can keep systems working in the better way for years by installing water treatment systems functionally and safe.

➤ **Industrial Installations**

In the industrial sector, MGO Pvt. Ltd. offers different and innovative solutions focus on the particular needs of individual company, in order to obtain the highest performance in that specific productive environment. They choose and control materials and single components, taking care of assembly to ensure long life to the installation even in the worst operative conditions of operation.

- **Distribution:** The heat distribution in an industrial building must be calibrated in according with the production process together with the comfort of the workplace.
- **Heating plant:** They have heating and cooling units for the acclimatization's and productions uses, run by any kind of combustible.
- **Fire extinguishing system:** They install fixed and automatic fire extinguishing systems, pumping stations and storage tanks.
- **Mechanical systems:**They are specialized in connecting and manufacturing of pipes and pipeline to transport fluid and gas, as well hot water, steam and hot oil.
- **Air compressed:** They perform installations and plants for the production of air compressed and relative distribution lines to connect pneumatic machines.

- **Dust Vacuum:** They perform installations and plants for the production of air compressed and relative distribution lines to connect pneumatic machines.

➤ **MGO Pvt. Ltd.& Renewable Energy**

MGO Pvt. Ltd. is ready to do the following installations.

- **Photovoltaic (PV):** MGO's Photovoltaic systems ensure durability and reliability with unmatched guarantees up to 25 years performance.
- **Thermal panels:** MGO Pvt. Ltd. Install solar panels to produce hot water or space heating with high design.
- **High-efficiency on thermo-solar:** MGO Pvt. Ltd. provide high-efficiency on thermo-solar for livestock farms, hotels or industrial activities.
- **Power station:** MGO Pvt. Ltd. carries industrial plants for the production of electricity from renewable sources.
- **Wind-systems (micro and macro):** The high technological level reached in the wind-system engineering, allows MGO Pvt. Ltd. to realize micro and macro wind-turbine to produce power and clean-energy by this free natural resource.

2.6 Services of MGO Pvt. Ltd.

At Renewable Energy Systems and Technologies, the main goal MGO Pvt. Ltd. is to help their customers and clients reduce greenhouse gas emissions, oil dependence and inefficient energy consumption. MGO Pvt. Ltd. not only sells equipment that works reliably under real field conditions but also they are providing long term services to their customers. They carefully design unique systems and use products specific to the needs of each individual client. Their leading superiority, code-compliant systems are safe, easy to install and understand, well documented and designed with the needs of their customers.

MGO Pvt. Ltd. provides energy consulting with particular focus on the choice of installations. They provides services based on how to optimize in terms of consumption, the air conditioning, the hot water production, the generation of heat, and driving forces for develop production



processes. The energy analysis is performed at 360 degrees by the team of specialists. Starting from the reducing the waste to create more efficient systems to realize for every need and place. The services includes-

➤ **Consulting**

- Saving and exploitation of local resources
- The efficiency of transformation processes.
- Proceeds from conceptual design to the final realization by specialized team.

➤ **Purchasing**

➤ **Installation**

➤ **Maintenance**

Renewable Energy Systems and Technologies helps businesses and homeowners generate their own electricity, space and water heating. The services providing by MGO Pvt. Ltd. allow their customers to reduce utility bills, lower carbon footprint, increase property's energy efficiency, or even to live off-grid altogether. MGO Pvt. Ltd. provides consulting, purchasing, system design, installation and maintenance services to meet all our energy needs.

The expert engineers of MGO Pvt. Ltd. are provide consultations to determine the right products and design that best suit the customers property, selecting cost-effective components and sub-systems that utilize technology like photovoltaic and wind energy. They also assist in finding all available tax credits, etc. to help their customers to keep their costs low. After implementing custom energy system, they carefully monitor functioning and efficiency and provide any necessary maintenance as time goes on.

2.7. Marketing

The term “Marketing” refers the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large. Marketing is the process by which companies create value for customers and build strong customer relationships, in order to. It is an integrated process through which companies build strong customer relationships and create value for their customers and for themselves. The term marketing concept holds that achieving organizational goals depends on knowing the needs and wants of target markets and delivering the desired satisfactions

Management of global Opportunities Private Limited (MGO) has been started its marketing activities from February, 2012. They are doing their marketing activities in order to identify their actual and potential customer from the existing market, capture value from customers in return, satisfy the customer, and keep the customer, anticipate the needs and wants of consumers satisfy them more effectively than competitors. MGO Pvt. Ltd. is doing their marketing activities in order to fulfill their main goal that is, to provide a complete pollution free green energy to meet our high demand of electricity by installing solar systems. Through their marketing activities they are creating value, solutions, and long term relationships with their customers.

2.7.1. Marketing Plan

The market for Solar Systems is creating a new market over here in Bangladesh. As per Bangladesh Government’s policy for power sector, it is going to be a giant market in near future. According to Bangladesh Government’s policy of power sector, all new buildings and structures should use a certain amount of solar system on the base of total load.

Management of Global Opportunities (MGO) is doing its marketing activities for last three month. In these three months all the marketing executives of MGO Pvt. Ltd. have visited over 250 real estate companies and private companies in different areas. The result of the market visits was really very positive and they have found huge possibilities. At present the Market size is about 300Kwp per month for Dhaka only and it is possible to enjoy at least 10% market share initially if we can cover (touch) at least 50% of the total market. So, to touch at least 50% market

by personal selling method, it is obvious to have a sales force and without a force no company will be successful in a perfect competition battle field.

There are many competitors (more or less 50 to 60) in the same market. From our market observation, we found out that no companies are using part-time executive or students for their marketing like ours. There are no basic promotional activities such as - advertisements on mass media, billboard, and so on. It is really a perfect competition market right now and every company wants to maximize their sales rather than maximizing their profit. Naturally most of the companies are reducing their price compromising the quality always.

2.7.2. Marketing Strategy

Generally organizations adopt such a marketing strategy which is most suitable for them. Like others, MGO Pvt. Ltd. has its own marketing strategy. That is Personal Selling. Personal selling is oral communication with potential buyers of a product with the intention of making a sale. Through personal selling all the marketing executives of MGO will focus initially on developing a relationship with the potential buyer, but will always ultimately end with an attempt to close the sale successfully.

Personal selling is one of the oldest forms of promotion. Personal selling is a face-to-face activity. In this strategy, customers therefore obtain a relatively high degree of personal attention. All the information's about their products and services can be customized to meet the needs of the customer. This is a two-way nature of the sales process which will help to allow the marketing executives of MGO to respond directly and promptly to customer questions and concerns. Personal selling is a good way of getting across large amounts of technical or other complex product information. The face-to-face sales meeting gives the sales force chance to demonstrate the product. Frequent meetings between sales force and customer provide an opportunity to build good long-term relationships. At this moment, it is the most important issue for MGO.

There are mainly six main activities of a sales force:

- **Prospecting** – As MGO is very new in the solar market of Bangladesh, they must try their best to find new customers from the existing market.
- **Communicating** – They need to communicate with existing and potential customers about their product lines, features, benefits, and price and discount offers and so on. MGO is offering high quality product manufactured by European high technology so they should communicate with the customers about their product to capture the target market.
- **Selling** – Through personal selling strategy they will contact with the customer, answering all the questions of the potential clients and try to close the sale successfully.
- **Servicing** – They must provide technical support, specifications, consultancy and service to the customer.
- **Information gathering** – personal selling method will help MGO to obtain information about the market and to feedback into the marketing planning process.

2.7.3. Market Segmentation Strategy

Market segmentation is the process of dividing a market up into different groups of customers, in order to create different products to meet their specific needs. The most obvious type of segmentation is between customers who buy distinctly different products.

MGO Pvt. Ltd. followed Geographic segmentation process to segment the solar systems market. They have selected Dhaka city as their main concern area. Geographic segmentation is a simple form of market segmentation. Certain countries, regions, are assumed to have common characteristics which influence buying attitudes. It makes sense to analyze particular market segments in terms of such characteristics. For MGO they have segmented their market based on the presence and position of Real Estate Offices. The basic market of MGO Pvt. Ltd. is Dhaka City based for now. Dhaka is one of the largest cities in Bangladesh with a 1463.60 square kilometers area. It should be noted that most of the Real Estate Companies are executing their Head Office activities at Gulshan, Banani, Dhanmondi, Mohammadpur, Panthapath and Motijheel area. So they have decided to put their maximum effort in these areas basically. So,



they have divided the entire Dhaka City into 10 regions to get maximum results covering entire the city. The regions are as follows:

1. Gulshan	2. Banani	3. Mirpur	4. Uttara	5. Baada, Rampura
6. Dhanmondi	7. Mohammadpur	8. Malibagh	9. Motijheel	10. Old Dhaka

2.7.4. Target Market of MGO Pvt. Ltd.

Target customers are the customers for whom products are produced. MGO Pvt. Ltd. also has target customers. As solar systems are very costly products and the price of the products and services are comparatively high for now. For now, the main target customers of MGO Pvt. Ltd. are the Real Estate companies. They are focusing on the real estate companies situated in Dhaka City. Bangladesh Government has passed a new policy that each and every new building should install a solar system in order to get electricity connection from national grid. It is well known over here in Bangladesh that if any owner of residential, commercial or industrial establishments want to be connected with National Grid, it is mandatory that a certain portion of total consumption of power has to supply from solar systems.

In this respect, there are over 1500 Real Estate (Building Constructor) Companies are working in Bangladesh and more than 80% among them are working in Dhaka City only. So basically our target customers are Real Estate Companies and Private Building owner in some case.

2.7.5. Pricing Strategy

Pricing is the most influential criteria to choose vendor for solar systems in Bangladesh. Maximum clients do not understand the quality of the components and it is basic psychology that they do not need a high quality systems, they need a system which will ensure their required power from the Government Electricity Supply Authority. But still there are some Real Estate companies and they are looking for solar system at a cheaper price, low quality, even for rental purpose. Therefore, people always look for the cheapest systems. So we should go on with a price which is really competitive in the present market.

MGO Pvt. Ltd. is offering Photovoltaic Solar Systems at 169/= Taka per watt. At present, this is really a very good price for our product and services. MGO Pvt. Ltd. is also interested to use some local components from the market in order to reduce their price. After market visits and market observation they have found that, there are so many solar companies in the market and they are offering really a very low price for their products and services. Based on their market overview, they have changed their price range. At first MGO Pvt. Ltd. offered their products at 370/= Taka per watt. But now for capture their target market they have changed their price range for several times. They were not familiar with the system of Bangladeshi market. They just fixed their price according to the price quotation which was approved by IRCI Spa.

2.8. Recruitment and Selection

As MGO Pvt. Ltd. is very new in the existing market for solar energy, the first plan was to recruit a large group of students and fresh graduates from different well known universities as Marketing Executives. They have followed European style to recruit marketing executives. They have contacted with some reputed universities and request to provide students for their organization. They are just at the starting stage of a company. They have no Human Resource Department (HR) for their company. Generally the HR department is responsible for doing all the recruitment and selection related activities. But in MGO Pvt. Ltd. there are two people from our Headquarter IRCI Spa, Italy. For now they are responsible for every decision. They are here at MGO as management team. They have followed European style while recruitment and selection process. There were only five times face to face interviews. There were no written tests for the candidates. The fifth and final interview was coordinated by Mr. Gabrielle. Finally they have selected only nine candidates as their part time marketing executive for three months. Generally they offer contractual jobs. The contracts are generally for three months. The extension of contracts totally depends on the overall performance of the employee. For now they have no traditional and structured recruitment and selection strategy.

2.8.1. Job Responsibilities

MGO Pvt. Ltd. has recruited one full time permanent marketing manager with experience and nine part time marketing executives for their company. They have developed some job related responsibilities approved from headquarter IRCI Spa, Italy. These are:

- **Job Responsibilities of Manager Marketing**
 - Lead a sales team with strong leadership.
 - Create Potential Buyer into Genuine Buyer.
 - Create proper guild line for Marketing Executive.
 - Search new prospective market.
 - Marketing Policy and Strategy preparation.
 - Preparation of Everyday / fortnightly / monthly Marketing Report.
 - Assist Marketing Executive in every sphere.

- Executive Marketing Analysis.
- Follow-up report analysis.
- Arrangement of Meeting with prospective clients.
- Keep regular communications and strong relations with all types of clients.
- Finding solution for Critical situation in Marketing.
- Follow “Personal Selling” Method.

▪ **Job Responsibilities of Executive Marketing**

- Search new clients on everyday basis.
- Submit positive approach about MGO to prospective clients.
- Make Follow-up on regular basis.
- Submit brochure and price idea, price list, and especial price offer to the client if necessary.
- Schedule and arrange meeting with concern person of the prospective clients.

2.9.SWOT Analysis of MGO Pvt. Ltd.

<u>Strength</u> 1. European Company. 2. European high quality technology. 3. Reasonable price. 4. Subsidiary from Italy.	<u>Weakness</u> 1. They are very new in the solar market. They have started their activities in February 2012. 2. They have no client list. 3. No work experience in Bangladesh. 4. High cost of Import.
<u>Opportunities</u> 1. High demand for electricity. 2. Government policy. 3. They are maintaining European standard. 4. High quality product at a reasonable price. 5. Market is expanding day by day.	<u>Threats</u> 1. The entire solar market is captured by Chinese companies. 2. Corruption in the system. 3. Manipulation and corruption in DESCO.

Chapter 3

3.1. Solar Energy in Urban Bangladesh

Bangladesh experiences unmanageable gap between supply and demand of electricity especially in summer. As a major consumer of electricity, Urban Households can use solar energy as an alternative source not only to get rid of everyday load shedding miseries but also to reduce the power shortage. But the use of solar energy in urban area is yet not very popular. Solar energy is best known for lighting rural households of Bangladesh where electricity has not yet reached.

Energy is one of the main concerns for the growing future of any nation. Energy is by far the largest merchandise in the world and an enormous amount of energy is extracted, distributed, converted and consumed in our global society daily. The global energy demand is continuously increasing. Today's global energy production is highly, in fact 83% dependent on fossil fuel resources such as oil, gas and coal. These resources are limited and their use results global warming due to emission of greenhouse gases like carbon dioxide. Interest in renewable energy has depended on the perceived risks of using fossil fuels. To provide a sustainable power production in future and at the same time be concern about global warming, there is a growing demand for energy from renewable resources such as wind, solar, geothermal and ocean. The sun is the source of the life on our planet Earth and, directly or indirectly, is the fuel for most renewable systems. Photovoltaic and solar thermal systems, as well as solar thermal power stations, convert solar irradiation directly into useable energy. Each square meter of the sun's surface emits a radiant power of 63.1 MW, which means that just a fifth of a square kilometer of the sun's surface emits an amount of energy equal to the global primary energy demand on earth. Only a small part of this energy reaches the earth's surface. This resource can be used to meet the global energy demand.

3.2. Electricity Crisis in Bangladesh

In Bangladesh, the serious demand and supply gap of electricity is one of the largest blockages for economic growth. As the capacity of power supply facilities is only around 4,000 MW compared to the peak electricity demand of 6,100 MW. Electricity suppliers have no choice but to have scheduled load-shedding of electricity supply during the peak time. Bangladesh is losing at least 3.5% of Gross Domestic product (GDP) due to the shortage of power supply.

3.3. Strategy for Reducing Power Crisis of Urban area

The world energy strategy is changing because of 3 main aspects:

- 1) Reduction of fossil fuels and price volatility.
- 2) Reduce emissions in the atmosphere.
- 3) Energy security and is necessity.

Bangladesh is taking a commercial point of view to develop this strategy actually they are using mostly biomass 35-60% of the total amount of energy, now they are increasing their capacity and the possibility to use mostly the help of the sunlight for this purpose.

According to PDB, the rural area of Bangladesh needs 2500 MW, but is given less than half of that. Dhaka Electricity Supply Authority (DESA) and Dhaka Electric Supply Company (DESCO) need more than 2000 MW power and the PDB needs 2000 MW electricity in a daily basis. From the above statistics, we can see Dhaka and other urban areas need around 4000 MW of electricity. As we know that Dhaka is the center city of Bangladesh and maximum offices, business institutions, industrializations are developing here day by day. So we can see that the urban areas of Bangladesh are the major consumer of electricity. Use of alternative sources of power supply in urban areas will definitely reduce the demand and the gap between demand and supply.

3.4. Renewable Energy

Renewable energy is energy which comes from natural resources such as sunlight, wind, rain, tides, and geothermal heat, which are renewable naturally replenished. About 16% of global final energy consumption comes from renewable, with 10% coming from traditional biomass, which is mainly used for heating, and 3.4% from hydroelectricity. New renewable energy such as - small hydro, modern biomass, wind, solar, geothermal, and biofuels are accounted for another 3% and are growing very rapidly. The share of renewable energies in electricity generation is around 19%, with 16% of global electricity coming from hydroelectricity and 3% from new renewable energy.

3.4.1. Types of Renewable Energy

Most of the countries currently rely heavily on coal, oil, and natural gas for its energy. Fossil fuels are non-renewable, that is, they draw on finite resources that will eventually dwindle, becoming too expensive or too environmentally damaging to retrieve. In contrast, the many types of renewable energy resources-such as wind and solar energy-are constantly replaced and will never run out.

➤ Solar Energy

Most renewable energy comes either directly or indirectly from the sun. From the sun we can get energy around 444 terra watts. Sunlight, or solar energy, can be used directly for heating and lighting homes and other buildings, for generating electricity, and for hot water heating, solar cooling, and a variety of commercial and industrial uses. Solar energy is such an energy which can be use any time and any place around in the world.

➤ Wind-system

From the coastal areas we get wind energy very easily. In the coastal areas wind is very powerful. For the coastal areas wind energy is very suitable. The sun's heat also drives the winds, whose energy, is captured with wind turbines. Then, the winds and the sun's heat cause water to evaporate. When this water vapor turns into rain or snow and flows

downhill into rivers or streams, its energy can be captured using hydroelectric power. Along with the rain and snow, sunlight causes plants to grow.

➤ **Bio Energy**

Bio gas or biomass can be found everywhere. The organic matter that makes up those plants is known as biomass. Biomass can be used to produce electricity, transportation fuels, or chemicals. The use of biomass for any of these purposes is called bioenergy. Hydrogen also can be found in many organic compounds, as well as water. It's the most abundant element on the Earth. But it doesn't occur naturally as a gas. It's always combined with other elements, such as with oxygen to make water. Once separated from another element, hydrogen can be burned as a fuel or converted into electricity. But bio energy is not suitable for moving one place to another.

➤ **Geothermal Energy**

Not all renewable energy resources come from the sun. Geothermal energy taps the Earth's internal heat for a variety of uses, including electric power production, and the heating and cooling of buildings. And the energy of the ocean's tides come from the gravitational pull of the moon and the sun upon the Earth. Geothermal energy mainly comes from the temperature and the warmth of the core of our earth.

There are two types of geothermal energies. These are –

- **Deep geothermal**- This type of energy is difficult to use.
- **Surface geothermal** – It is available and not so powerful.

➤ **Hydrological Energy**

Hydrological energy comes from water, river, and seas. Ocean energy comes from a number of sources. This type of energy can be generated from water current, water fall or sea tide. In addition to tidal energy, there's the energy of the ocean's waves, which are driven by both the tides and the winds. When a huge amount of water moves at the same time it can also generate hydrological energy. The sun also warms the surface of the ocean more than the ocean depths, creating a temperature difference that can be used as an energy source. All these forms of ocean energy can be used to produce electricity.

3.5. Solar Energy: The Most Feasible form of Renewable energy for Urban Bangladesh

Solar Energy is the best renewable energy source other than the primary nonrenewable sources in urban area. Other form of renewable energies generated from wind, bio gas, ocean tide, hydro etc. have very little feasibility in urban areas of Bangladesh. Most of the cities are few meters up from the sea level. So there is not that much feasibility for hydropower except Chittagong Hill Tracts and few other places. Bangladesh has very few potential locations for hydroelectric project. Wind and Ocean tide energy can be the sources, but the exact potential is not clearly known due to lack of study and relevant information. So the solar energy is the ultimate suitable form of renewable energy for urban region because of availability of plenty of sunshine.

3.5.1. What is Solar Energy

Solar energy, radiant light and heat from the sun, has been harnessed by humans since ancient times using a range of ever-evolving technologies. Solar energy technologies include solar heating, solar photovoltaic, solar thermal electricity and solar architecture, which can make considerable contributions to solving some of the most urgent problems the world now faces.

Solar technologies are broadly characterized as either passive solar or active solar depending on the way they capture, convert and distribute solar energy. Active solar techniques include the use of photovoltaic panels and solar thermal collectors to harness the energy. Passive solar techniques include orienting a building to the Sun, selecting materials with favorable thermal mass or light dispersing properties, and designing spaces that naturally circulate air.

The development of affordable, inexhaustible and clean solar energy technologies will have huge longer-term benefits. It will increase countries' energy security through reliance on an indigenous, inexhaustible and mostly import-independent resource, enhance sustainability, reduce pollution, lower the costs of mitigating climate change, and keep fossil fuel prices lower than otherwise. These advantages are global. Hence the additional costs of the incentives for early deployment should be considered learning investments; they must be wisely spent and need to be widely shared.

Solar energy can be harnessed in different levels around the world. Depending on a geographical location the closer to the equator the more potential solar energy is available.

3.6. Applications of Solar Technology

Solar energy refers primarily to the use of solar radiation for practical ends. However, all renewable energies, other than geothermal and tidal, derive their energy from the sun. Solar energy can be used in different field and applications. It needs specific features and it can run from few watt (W) to plenty megawatts (MW) and even more. Available configurations of solar energy are –

- **Grid Tied** – In grid tied system the solar module is directly connected to the main system provided by DESCO.
- **Stand Alone** – Stand Alone System is generally made for personal usage.
- **Hybrid**– Hybrid System is a combination of Stand Alone and Grid Tied Systems. In this system, all the power produced from the PV System will directly store in the grid then we can use as much we needed.
- **Minigrid** – This system can generate a huge amount of energy. This energy can be distributed to the people living in the same area.
- **Special or Specific use**– this type of system is not for general people. It is used for the Military Systems of a country, Central system, Weather, and or Communication Station in a rural area etc.

Solar technologies are broadly characterized as either passive or active depending on the way they capture, convert and distribute sunlight. Active solar techniques use photovoltaic panels, pumps, and fans to convert sunlight into useful outputs. Passive solar techniques include selecting materials with favorable thermal properties, designing spaces that naturally circulate air, and referencing the position of a building to the Sun. Active solar technologies increase the supply of energy and are considered supply side technologies, while passive solar technologies reduce the need for alternate resources and are generally considered demand side technologies.

3.7. Reliability of solar power

Solar systems built today are very reliable. They have proven to be dependable sources of energy for large office buildings, mass retailers and governmental agencies, supplying megawatts of energy. Some of the largest companies in the world have buildings powered by solar energy, including eBay, Wal-Mart, and the US Air Force. Solar City has incredible high quality standards and only uses best of breed equipment.

3.8. How long will a solar system last

Generally, most of the parts of any solar system, such as solar panels, carry manufacturer's warranties of 25 years; other parts, such as inverters, carry 10-year warranties. In addition, 20 years of included monitoring and repair service. Most solar systems may far outlast their warranties; many of the first solar systems installed more than 30 years ago are still going strong.

3.9. Types of Photovoltaic (PV) Solar Systems

There are mainly two types of solar systems now available in market. They are:

- On-grid Solar Home System
- Off-grid Solar System or Grid Connected Solar Home System

3.9.1. On-grid Solar Home System

An on-grid Solar Home System Solar electric systems, which are also called photovoltaic or PV systems, are reliable and pollution-free. They make use of a renewable source of energy—the sun. Photovoltaic (PV) systems convert sunlight directly to electricity. They work any time the sun is shining, but more electricity is produced when the sunlight is more intense and strikes the PV modules directly. The basic building block of PV technology is the solar cell. Multiple PV cells are connected to form a PV module, the smallest PV component sold commercially.

A PV system connected or tied to the utility grid has these components:

- a) One or more PV modules, which are connected to an inverter.
- b) The converter, which converts the system's direct current (DC) electricity to alternating current (AC) and vice versa.
- c) Batteries (optional) to provide energy storage or backup power in case of a power interruption or outage on the grid.

3.9.2. Grid Connected Solar Home System

The initial capital cost for the renewable system is very high. The project life time is 20 years. A part of the initial capital cost is possible to recover from the power sell back to the grid. As 68% of the load demand is possible to meet by the PV generation, only 32% load demand needs to fulfill from the grid. Other than the initial cost, there are some constrains of solar systems. First, PV produces power intermittently because it works only when the sun is shining. This is not a problem for PV systems connected to the utility grid, because any additional electricity required is automatically delivered to the consumer by the utility. In case of off-grid or stand-alone PV systems, batteries can be purchased to store the excess energy for later use.

PV-generated electricity is usually more expensive than conventional utility-supplied electricity. Therefore, if the consumer lives near the existing power lines, a solar rebate program and net metering can help to make PV home system more affordable. The customer is billed for the net electricity purchased from the utility over the entire billing period that is, the difference between the electricity coming from the power grid and the electricity generated by the PV system. In more than 35 states, customers who own PV systems can benefit from laws and regulations that require net electric meter reading.

3.10. Components of Photovoltaic (PV) System

A Photovoltaic System (PV) is composed by few specific components and those components should be sized and designed in a proper way in order to get all the available energy from the sun. Each component takes care to a specific function in the system. A proper configuration jointed to the quality of the products which gives the performance of the system. The quality and performance of a Photovoltaic System (PV) mainly depends on the use of different types of components. So it is very important to maintain the standard of all the parts equally otherwise it might produce low quality energy. Photovoltaic solar panel has some basic components. These are –

- **Photovoltaic (PV) Solar Module or Panel**

The core of the PV systems is the module. The module is able to convert the energy of the light or photon into electric energy. We can use this energy directly from the modules. But it is not stable and properly suitable for all kind of use. So we should use an additional device in order to get a suitable power from the sun.

There are mainly four types of Photovoltaic (PV) Solar Panel. These are –

- **Mono Crystalline**
- **Poly or Multi Crystalline**
- **Thin Film or Paint**
- **Amorphous**

- **Battery**

Battery is the most delicate and problematic block in a Photovoltaic (PV) System. Battery must be accumulate the energy and give it to the loads when it is not possible to get energy directly from the module and grid source. The performance of the battery is strictly connected with the usage and location. The battery is very much sensible to the temperature, the number of cycles and the depth of discharge. So if we want to utilize the battery in a proper way and get maximum energy from it then we must be careful about these factors and set the battery in a secure place.

- **Inverter**

This component in AC systems converts the electricity in DC to AC mode, in order to run all the most common products and tools of our daily ordinary life. Inverters are available in different size, mono or triple phase in order to cover all kind of request. A good quality inverter's performance is among 90%-95% and the life time is around 10 years.

- **Charge Controller (CC)**

Charge Controller (CC) plays a very important role in the PV systems. The main task of Charge Controller is to control and stabilize the energy. This component controls battery charge and discharge cycles. It manages the absorption from the modules and provides power to the load. A high quality Charge Controller can enlarge the life of battery and protect the modules from the reverse current.

- **Proper Light System**

The light systems should be efficient, especially in the little kit or little system. Because in this case, it will produce a little amount of energy and it is really very important to use it full and without any dispersion.

- **Switch, Cables and other parts**

All components in a Photovoltaic (PV) System are really and equally important. And all of them contributes to make the system efficiently and safe. Many companies use undersized cables or sometimes they use poor shield in order to save some money. As a result, they don't get proper amount of energy from the systems. So in order to get maximum amount of energy from the system we should always use high quality, proper sized of cables.

3.11. A Complete Photovoltaic (PV) and Thin Film Solar System



Figure 1: Photovoltaic (PV) Solar system



Figure 2: Thin Film Solar System

3.12. Potential of Solar Energy in Bangladesh

Bangladesh is located between 20° 30' and 26° 45' north latitude and the climate is tropical, the very location makes Bangladesh good recipient of solar energy Bangladesh.

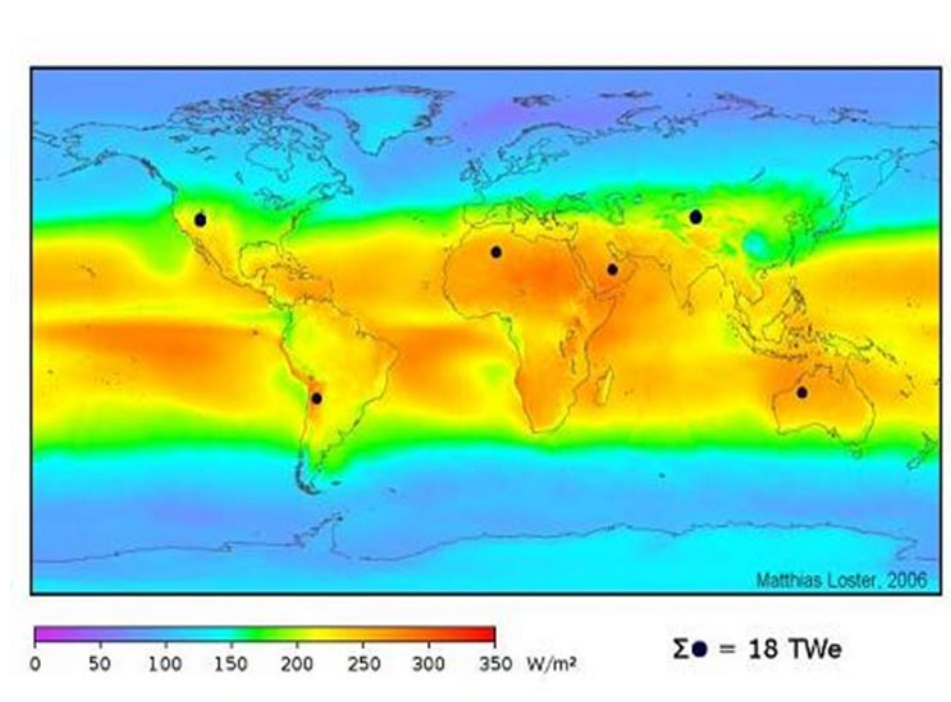


Figure 3: Average sunlight of Bangladesh is around 200-250 watt per hour.

Maximum amount of radiation is available on the month of March-April and minimum on December-January. The total solar energy reaching Bangladesh is 105 times the energy generated as electricity. A study on solar energy of Bangladesh found that, the daily sunlight hours in Bangladesh to range from 10 to 7 hours; they further reduced this by 54% which is equal to 4.6 hours to account for rainfall, cloud, fog and dust over the solar panels .

Renewable energy contributes about 40 % of the primary energy consumption in the country, mainly through biomass, e.g. agricultural residues contribute almost half the national total, with cow dung, bio gas and fuel wood making up the rest. Those are providing poor quality cooking and lighting fuels. Developing renewable energy access can address the electrification problem of rural and isolated areas. The potential for some types of solar and biomass is very significant, while others such as - wind, hydro, geothermal, ocean etc. will require technical and financial

capacities not yet available in the country. The potential for solar energy, in particular, is major: the yearly average solar irradiation in the country is 4.5 KW per hour per day. Moreover renewable energy is best placed to provide access to energy in remote and rural areas. The continued and improved development of energy services for the poor can play a triggering role in tackling poverty by increasing economic activity in both agricultural and industrial areas, thus creating income generation opportunities and livelihood improvement. As the potential is there, it is rather a matter of putting in place the right framework conditions at policy and regulatory level.

3.13. Why is renewable energy important?

Renewable energy is important because of the benefits it provides. The key benefits are:

➤ **Environmental Benefits**

Renewable energy technologies are clean sources of energy that have a much lower environmental impact than conventional energy technologies.

➤ **Energy for our children's children's children**

Renewable energy will not run out ever. Other sources of energy are finite and will be depleted someday. The supply of other sources is limited at a certain point or level of usage.

➤ **Jobs and the Economy**

Most renewable energy investments are spent on materials and workmanship to build and maintain the facilities, rather than on costly energy imports. Renewable energy investments are usually spent within the United States, frequently in the same state, and often in the same town. This means your energy dollars stay home to create jobs and fuel local economies, rather than going overseas.

➤ **Energy Security**

After the oil supply disruptions of the early 1970s, most of the nations have increased its dependence on foreign oil supplies instead of decreasing it. This increased dependence impacts more than just our national energy policy.

3.14. Present Scenario of Solar Energy in Bangladesh

The uses of small-scale photovoltaic systems have been a very recent phenomenon in rural areas of Bangladesh. Most of the small applications in rural areas are in the households to meet the basic purposes of lighting and entertainment by operating TV and Radio. Infrastructure Development Company Ltd. (IDCOL), a Bangladesh-Government-owned financing company, under Rural Electrification and Renewable Energy Development Project (REREDP) through 15 partner organizations (POs). Among those partner organizations Grameen Shakti is in the leading position. Starting its operation in 1996, Grameen Shakti has sold 230,000 solar systems all in the heart of rural Bangladesh. So it is clear that majority of solar power utilization is done in rural areas. Its potential in the urban area is less addressed issue.

At present the power demand in Bangladesh is about 5500MW, whereas the generation ranges only 3200- 4000MW. The generation capacity is 4300MW. But peak demand is estimated to exceed 5,000 MW. As a result of power shortage causes excessive load shading. Bangladesh relies heavily on fossil fuels for its energy especially on gas resources. But the present proven reserve would be depleted by 2015. Coal is still the major fuel for power generation. Bangladesh has sufficient high quality coal resources. But the coal mining is not started. Exploration and development of natural gas resource has almost reduced to zero. Also the exploration of coal continues to remain uncertain. The shortage of power can be met by renewable energy which is abundant in nature. In Bangladesh the development of renewable energy is insufficient. The one and only hydro power plant is in Karnaphuly can generate 230MW. The coastal areas and the north-eastern regions contain areas with high wind, and small-scale wind energy conversion system could be built only on that area. Grameen Shakti (GS) is working on solar home system. But GS's solar program mainly targets those areas, which have no access to conventional electricity and a little chance of getting connected to the grid within 5 to 10 years.

Power generation in Bangladesh has been dependent on natural gas and still now, 79.331% of electricity is being produced from our gas reserve. However, our net remaining gas reserve (proven and probable) is only 13.53 Tcf. According to present proven reserve of indigenous gas will be exhausted by 2030. On the other hand, our coal reserve is only 2.7 billion tons.

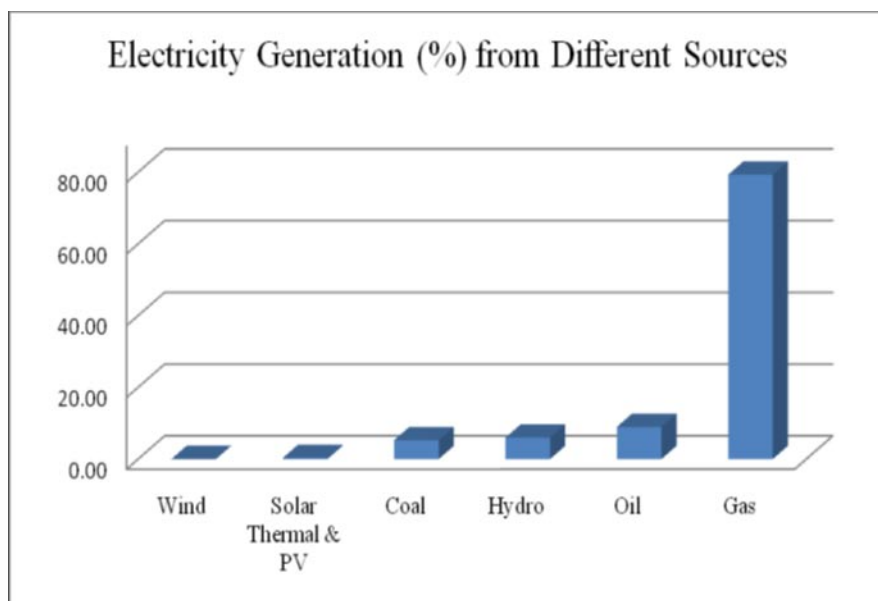


Figure 4: Percentage of electricity generation in Bangladesh from different sources

3.15. Usage of Solar Energy

Uses of solar energy are limited only by human creativity. A partial list of solar applications includes space heating and cooling through solar architecture, potable water via distillation and disinfection, day lighting, solar hot water, solar cooking, and high temperature process heat for industrial purposes. To harvest the solar energy, the most common way is to use solar panels. In Bangladesh by using Solar PV Panels solar energy is harvested as solar home system, centralized (AC) system, centralized (AC) market electrification, water pumping, rural clinic, roof top PV mini-grid system, telecommunications, railway signaling, refrigeration, cyclone shelters etc. Solar energy is also used to charge IPS batteries as single or dual source.

At present, the solar home systems are not cost competitive against conventional fossil fuel based grid interfaced power sources because of the initial capital cost. However, to fulfill the basic need for the consumer and improvements in alternative energy technologies bear good potential for widespread use of such systems. The solar systems may be a cost issue in respect of Bangladesh; however, it is possible to overcome by introducing some incentives offered by the

government and utility companies. It can also be implemented in commercial building, telecommunication sector and water pumping for irrigation.

3.16. Opportunities of Employment and GDP Growth

Renewable energy creates more jobs per unit of energy produced and per dollar spent than fossil fuel technologies do. The ongoing trend to promote renewable energy based power generation indicates that it has tremendous job creation potential and has a direct impact on country's GDP growth. Solar industry creates 5.65 jobs and the wind energy creates 5.7 jobs per million U.S. Dollar investments. By contrast, coal industry creates only 3.96 jobs per million dollar investment. As a major portion of renewable energy based electricity is expected to come from solar and wind, so 1500 and 3000 direct job opportunity would be available by 2015 and 2020 respectively. In addition, a large number of indirect job opportunities will be available by 2015 and 2020 if adequate investment is possible to attract in Bangladesh. This will surely be a relief for Bangladesh, as it has been suffering from unemployment problem with 4.8% unemployment rate. In addition, we can be benefited by exporting skilled workers from this sector in overseas. This huge employment opportunity certainly will create a positive impact on GDP growth and give a pace to achieve double-digit GDP growth.

3.17. Solar energy pros and cons: Photovoltaic PV systems

3.17.1. Advantages of Photovoltaic (PV) systems

Photovoltaic systems can be an ideal solution for covering basic energy needs of contemporary and next generation societies. PV systems can facilitate a sustainable energy mix which is friendly to the environment by utilization of their significant advantages:

- PV systems are environmentally friendly. In contrary to the conventional power generation from fossil fuels, PV systems use solar power, a renewable green energy source, to generate electricity. Thus they help reduce Co₂ emissions to the atmosphere which in turn reduces the “greenhouse effect”. Moreover PV systems, as any other renewable green energy technology, avoid or reduce other harmful gas emissions to the atmosphere which constitute a threat to the public health and the environment.
- PV systems are a reliable technology for the exploitation of solar energy. Current industry data shows that PV systems are expected to last for 30 years before any replacement is required.
- PV systems operate autonomous, and do not generate any noise or disturbances. PV systems do not have any moving parts and do not pollute the atmosphere or the surrounding environment by their operation.
- Compared to other renewable green energy technologies, PV systems require minimum maintenance; only minor checking of cable connections and a basic-regular cleaning of the panel surfaces is adequate to keep them operational for several years.
- Because PV systems can be used for remote and ‘small’ power generation plants, they are ideal for distributed power generation. In such networks, energy losses in the power grid due to long distances between point of power generation and power consumption are minimized and network efficiency is increased.
- PV systems can help achieve cost savings in the forms of increased power-network-efficiency and lower capital expenditure for the construction of power lines.
- An important advantage of PV systems, inherited to all solar power technologies, is that they have peak production of energy when energy demand is at maximum levels mainly during the summer. This attribute facilitates towards peak-shaving and ‘smoothing’ of the load curve thus reduce the possibility of a power black-out.

- PV systems through recent technological evolution, are gradually becoming more popular due to recent achievements in cost-reductions which are slowly becoming evident in the PV market but primarily due to their application-diversity, modularity, and ease of installation and expandability. However, having referred to cost reductions, it is important to stress that PV systems continue to be expensive and that PV industry has still a long way before PV systems can reach viable costs in the market.

Other Advantages are:

- **No Pollution:** Solar power does not release carbon dioxide, sulfur dioxide, nitrogen oxide, mercury radiation into the atmosphere. It does not burn fuel and generates no radiations.
- **Cost Effective:** After the initial investment, people generally use less energy, so the utility bills will be much lower and often times there won't be an amount due at all.
- **Less Consumption:** Solar systems requires no fuel, you will save money on the cost of gasoline.
- **Nearly Maintenance Free:** Manufacturers are offering warranties of 20 years and more.
- **Energy Credits:** People can build a credit of energy if the solar system produces more energy than the use. Solar system is a system that gives credit for excess electricity.
- **It's Sustainable and Renewable:** Fossil fuels such as coal, oil and natural gas are non-renewable and dwindling. Solar energy will never run out.
- **The Noise Factor:** The entire solar systems are silent and have no moving parts.

3.17.2. Disadvantages of Photovoltaic (PV) systems

- The basic disadvantage of solar photovoltaic systems is their cost which remains relatively high. Of course this is relative to the alternatives that PV systems are being compared to. For example, the electrical energy produced by a photovoltaic system is estimated to cost a lot more than the cost of energy produced by a system of Wind turbines or from biomass. Similarly, the cost of PV energy is a lot more than that of energy produced from conventional, non-renewable energy sources (fossil fuels), such as oil or natural gas. Consequently, until anticipated technological progress is realized by

achieving further cost reductions and increasing their efficiency, PV systems' popularity and application rate in the market will be limited.

- Another disadvantage of PV systems is that they generate DC current; as already explained installations for power generation and connection to the power grid requires the use of inverters which currently constitute an expensive solution. Moreover, reliability issues require the use of energy storage (batteries) increasing even further PV installation costs.
- Compared to other solar energy technologies, PV systems have a low efficiency level, in the range of 8% – 20 % depending on the technology used (mono-crystalline, polycrystalline or thin-film PV panels).

Other Disadvantages are:

- **High Cost:** The main disadvantage is the price. The panels and installation have high starting costs.
- **Climate Variability:** Although solar energy can be used in most climates, the number of hours of sunlight will determine the number of panels you'll need and what the wattage of power will be.
- **Require vacant place:** Solar panels take up quite a bit of roof space and to some and are not pleasant to look at.
- **Limited Time:** Solar PV systems does not work 24 hours. Solar PV systems only work when the sun is shining. At night you will have to rely on stored energy from net metering or have an alternative system.

In general, Photovoltaic systems can offer a range of benefits and constitute an important area of technological application for the exploitation and use of renewable energy sources (Solar power). Given the above analysis, it becomes clear that the two main factors hindering their application are high cost and relative low efficiency. Consequently, further technological progress and continuous financial support, through subsidies and incentives provided for all renewable energy applications will play a crucial role for accelerating the adoption of solar PV systems.

3.18 Various problems hinder the growth of Solar Energy

In most of the cases, the solar energy sector is facing problems with second-rate solar panels and battery. There are complains that the battery quality is not up to mark to achieve satisfying performance. Insufficient warranty period of battery & inverter is another problem. Bangladesh is currently importing almost all the solar panels; low cost substandard panels are inundating the market. Instead of using high quality premium priced solar panels, most of the people are using cheap insufficient brands and facing numerous troubles. In that process they are losing their interest in using solar energy. Moreover, Information regarding use of solar energy is not readily available in the market.

Although Bangladesh government has already formulated a Renewable Energy Policy in 2008, it has not been enacted as a law yet. Therefore, concerned authorities are not bound to meet up all the facility or targets that are promised to boost up renewable energy sector. Unavailability of relevant data and necessary information, lack of dedicated governmental Research & Development (R&D) wing, limited expertise on system design, installation, operation and maintenance of renewable energy technologies are the main barriers to promote renewable energy in Bangladesh. Bangladesh government is producing 127.43 MW of electricity, whereas the various Non-governmental organizations (NGOs) are contributing with 33.5 MW using renewable sources. However, if we consider the non-hydro electricity production then we will find that the government contribution in renewable energy sector is so poor in comparing with NGOs. Such poor participation of government often discourages investors to invest and take risk as it seemed non-profitable initially in renewable energy investment.

Chapter 4

4.1. My Experience in Management of Global Opportunities (MGO)

4.1.1. Description of the Project

At the end of BBA program students must have to accomplish an integrated course called internship that is relevant to academic purpose. The main objective of internship is to have practical experience of professional job relative to the student's major or minor concentrated area. During this internship period students have to work for any organization. It's like fulltime job. While working with organization students are given the opportunity to learn something about a particular department as well as make a contribution to the company by performing needed tasks. Often internees are paid for the time they work, in some instances, they are not. I did my internship in Management of Global Opportunities Privet Limited (MGO). It's a totally new company in Bangladesh. MGO Pvt. Ltd. started their business in February 2012. I worked as an intern in MGO Pvt. Ltd. I started my internship on 19th February, 2012 and on finished the internship period on 19th of May, 2012. It was fulltime internship. I had to work from 10:30am to 6:30pm. The office was situated in 13/A/2, Gulshan- 2, Dhaka. As an intern I worked in Marketing Department as a Marketing Executive. There I performed some marketing activities and market related responsibilities such as preparing database, preparing list of our customers, take appointment for visit clients corporate offices, discuss our products , services, and price, visit ongoing construction projects, buildings, commercial complexes, shopping mall, apartments etc., conduct meeting with clients, preparing reports on the meeting results, etc.. With thetechnical team of MGO Pvt. Ltd., I worked on some technical tasks such as- taking measurement for the solar systems for a specific commercial building etc.In the internship report I will be concentrating on the initial and temporary marketing activities as they are still working on their marketing strategies and it is not fixed yet, they are changing their structure and strategies on a regular basis.

4.1.2. Specific Responsibilities of the Job

As per the academic rule I must have to do three months internship. I did my internship in Management of Global Opportunities Privet Limited (MGO). It is situated in the 13/A/2, Gulshan- 2, Dhaka. The internship period started on 19th of February, 2012 and ended on 19th May, 2012. During this internship period I used to work in Marketing Department of MGO Pvt. Ltd. I had some responsibilities related to marketing activities. The specific responsibilities of mine during this internship period are given below:

➤ Preparing Database

MGO Pvt. Ltd. started their business in Bangladesh from February, 2012. They are very new in this country. They started their marketing activities from March, 2012. But before starting their marketing activities they wanted to find out all possible information's about all the Real Estate companies of Bangladesh, especially those which are situated at Dhaka. Their target market is the real estate companies. Their planning is to provide solar systems to the urban portion of this country. So as a marketing executive my first task was to collect as much information as possible about the real estate companies. For collect information, I have used different sources. All the sources are given bellow:

- Internet
- Latest version of REHAB Directory
- Bangladesh yellow Page
- Different websites related to real estate, developers companies
- I have called some of my friends and relatives who work for real estate companies and who has connections with them.

After collecting all the information's about real estate companies my responsibility was to put all those information in a database.

Visited client list

DATA CLIENTE		Contact made by: Farhabi	
Real Estate	Upal & Associates Ltd.	CL typology	Real Estate
Contact person	Md. Nasir Uddin Dewan		
Road - Address	60/1, R.K. Mission Road, Gopibagh		
Area - Address	Motiheel	City	Dhaka
District	Dhaka	zone	Motiheel
Contact person phone	+8801716801966		
Tel 1		email 1	nasir_htl@yahoo.com
Tel 2		email 2	
Tel 3		website	
Fax			
note			

work_with_competitor ☐

Result of the meeting

1st meeting date	4/15/2012		
1st - price			
1st - request 1			
1st - note req 1			
1st - request 2			
1st - note req 2			
1st - request 3			
1st - note req 3			
2nd meeting ☐	2nd meeting date	2nd - price	
2nd - request			

Figure 5: Sample of Database.

➤ Training Session

The entire internship program was divided into main two parts. The first month I had to attend a training session. Every day from 10:00am to 1:00pm I had to attend training class then I had to start work with database. MGO Pvt. Ltd. Provide one month training program for all their new employees and interns. As an intern at their organization, I have

attended one month training program. The main purpose of this training was to provide a clear overview of the organization, who they are, what they do, what are the products and services they sell to their customers etc. and so on. The entire training session was divided into two parts. They recruited students from different backgrounds. So, they decided to provide a training session for them. As a result they will get well trained about renewable energies and technologies and they will be successful in marketing their product and services as well.

- **Technical**

Technical part of the training was held by the Company Secretary and head of Electric Engineering department Mr. CristianGlorosio. This part consists of the all the technical specifications of Photovoltaic (PV) Solar Systems. Before start our marketing activities we need to know each and every thing concerning our products and services. As our products are photovoltaic Solar Systems, so we need to get familiar with its high technology. From this training we have learned so many things about solar technologies, how it works, how to calculate electricity load for a building, we have learned about all the components that we are going to use in order to install a complete solar system. Time duration for the technical training was two weeks.

- **Marketing**

The marketing part was held by Mr. SaleheenKabir, Manager, Marketing. He covered all the aspects of our marketing activities. He discussed about their marketing planning, marketing strategies, target market, pricing strategy and so on. Time duration of the marketing training was short, only for one week.

4.1.3. Market Visit:

After getting one month training on technical specifications of Photovoltaic Solar Systems and marketing strategies, I was assigned to perform marketing activities. I was given a target of visit at least five real estate companies in one day within same location. The entire Dhanmondi zone including Mirpur Road and Panthapath was under my control. I have visited 20 Real Estate companies in total. On daily basis I was given a target to visit at least three to five potential customers from the market. By all the marketing executives they were expected 35 to 40 potential customers visit on Monthly basis. My target was to make at least 10% to 15% of the visited customers as our genuine (success) customer.

Sometimes I had to go their corporate offices to talk with the Managing Director, sometimes I went to their ongoing projects to talk with the project manager, electric engineer, project supervisor. For the first one week I did market visits or field works individually then next three weeks I did team work. First three weeks of my team work I moved with our engineer Mr. Sanawas Babu in the market. From the middle of April, 2012, I did my marketing activities under direct supervision of our C.E.O. Mr. Dr. Francesco Silvestre.

The steps I have followed during my marketing activities are given bellow:

- First select five real estate companies from the list and database I have prepared.
- Make phone calls to the corporate head offices of those real estate companies to identify the concern person who deals with solar systems for buildings. I found out in most of the cases, the purchase department, managing director, and general manager of electrical engineering deals with solar systems and make decisions.
- Again make phone calls to the concern person and take appointment time and fix a meeting date.
- Conduct meeting
- Take measurement for solar system.
- If needed then fix a second meeting date and time.
- After the meeting make marketing report using MS Excel.
- Submit marketing reports to the C.E.O and Marketing Manager.

- Again fill up another database (for visited customers). Put all the information's collected during meetings.

Marketing Report-Farhabi (22-03-2012)

Sl	Company Name	Contact Person	Discussion	Results
1	Amigo Properties and Developments Ltd.	Mr. Syed Niaz Ahmed Roomy, Director Finance & Admin	Today I have visited this company with Mr. Romel. We had an appointment with Mr. Niaz. I talked with him about our company, product and especial promotional price offer. I have explained everything regarding our promotional price offer and gave him our company brochure so that he can understand about our company at a one glance. he said that they want high quality product & he knows about Italian and German technology & quality of product. As we are offering a very competitive price 160 TK per watt he said that he would like to take solar system from us and sign contract for the especial price offer. he said they need solar system for 2 projects- 1 in Dhanmondi another at Uttara. but he could not give us any approximate amount for solar system. he said me to send him our companies prescribed contract paper and terms and conditions for signing areement. he will check all these with their company's rules, regulations and policies. if he find any problem then he will let me know and try to fix it. then if everything matches with their policy then he will make a contract with us.	Today we have a very succesfull meeting Mr. Niaz want to make contract with us for solar system at 160 tk per watt. they need solar system for 2 projects. one in Dhanmondi which will be handed over by November 2012, another one is at Uttara by August 2012. he liked my attitude and reffered me to another real estate company Aster Park Holdings Ltd. they are also interested about our product and promotional price offer. Once they work with us they wanted to build a positive, longterm business relationship with us then they will continuously work with us.
2	Sheltech	Engr. Md. Zahangir Allam, Manager Supply Chain Division	i have talked with the concern person for solar system Mr. Zahangir. He said that they take solar system from Rahim Afroz and they have very good connection and business relationship with them. They are planning to take solar systems from any other company for now. but still I explaind him everthing about our company, products and especial promotional price offer. and I requested him to consider our offer as we are providing Italian high quality products at a very competitive price range.	Generally thay take solar products from RahimAfroz.
3	A.B. Developers Ltd.	Md. Saiful Islam	I had arranged a meeting yesterday. So, today I met with Mr. Saiful and talked about our company, product, promotional price offer. They have some ongoing projects in Dhaka. Today i have visited one of them. The handover date is July 2013. Mr. Saiful asked some technical questions and Mr. Romel explained him everything. he said they need solar system for fan and AC. they have a plan to take solar system for 1 floor for their MD.	They dont have any solar requirment in this year. I have to keep contact with him and remind him about our product and services.
4	Aster Park Holdings Ltd.	Engr. Mahfuj	Mr. Niaz, Amigo properties and Developers Ltd. Referred me to this company. They are interested about producta and especial price promotion. And their is a chance to make a contract . So I called him and took an appointment to talk with him face to face and discuss everything to him.	I have a upcoming meeting on coming Thursday 31st may.

Figure 6: Sample of Marketing Report

4.2.Critical Observationand General Findings

After observing the entire activities of MGO Pvt. Ltd., I found some problematic facts about some of their activities. All these facts can be considered as problems or criticisms. There are some responsibilities and duties where MGO Pvt. Ltd. faces problems. Besides, some responsibilities have no problem to perform. The problems that I found out are as follows:

- As MGO Pvt. Ltd. is in very earlier stage . They dont have any proper structure for their company. They dont have any specific and separate department such as – Human Resource Department, Marketing, Finance, Engineering etc. for their company.
- Recruitment and Selection process of MGO Pvt. Ltd. is not appropriate. They are doing business in Bangladesh for last four months. They are just at the introduction stage of their business. They don't have any proper Human Resource Department, structure, policy for recruiting people. In February they have recruited nine employees for the first time. But they have recruited nine marketing executives for only their marketing activities. Most importantly, they have recruited some students from finance, economics and HR background as marketing executives. They should create their HR Department as soon as possible.
- MGO Pvt. Ltd. is not doing any promotional activities such as – advertisement on mass media, billboard etc. They directly recruited nine marketing executives and started their marketing activities.
- MGO Pvt. Ltd. is facing so many problems in their decision making process. Because they dont have proper authority to take any kind of decision of their own. Each and every direction and order directly come from Italy. Without any approval MGO Pvt. Ltd. is not allowed to take or make any kind of decision.
- MGO Pvt. Ltd. is following personal selling concept. But there are some major disadvantages of this strategy. The main disadvantage of personal selling is the cost of employing a large number of sales forces. Sales people are expensive. In addition to the

basic pay package, a business needs to provide incentives to achieve sales and the equipment to make sales calls such as - car, travel costs, mobile phone bill etc. In addition, a sales person can only call on one customer at a time. This is not a costeffective way of reaching a large audience.

- MGO Pvt. Ltd. has no client list. They have no previous work experience in Bangladesh. This is the most important for MGO to get a client list as soon as possible. Because without any client list it would be very difficult for them to sale their product and services in Bangladesh.
- From the market analysis we have found out that, most of the clients want very poor and cheap quality products . Their main purpose is to get electicity connection for their buildings from the national grid. But, MGO is offering high quality product from Italy and the price is little bit higher. Since, there are leakages in Government monitoring system, Real Estate companies are looking for cheap quality producr at a low price and they are not interested to use solar solar system.

5.Recommendation

To design an effective national solar energy program on the basis on these financial models, there are some general recommendations given bellow:

- They should creat specific departments such as – Marketing, Finance, Human Resource, Engineering department etc. for their overall activities as soon as possible.
- For filling up vacancies they should build and follow traditional rules, policy, steps and processes then recruit employees with proper background in order to match their job responsibilities. Only then they will be able to work properly and bring successful results. Otherwise they have to provide proper training to their employees from different background which is costly and time consuming. They should recrute experienced and knowlegable manager for each individual department. These managers can guide all the part time employees as most of them are student, fresh graduate without any work experience.
- MGO. Pvt. Ltd. is not doing any promotional activities for their product and services. But at this stage they need to creat brand awareness. MGO. Pvt. Ltd. is a joint venture company with Italian company IRCI Spa. The entire solar market is captured by Chinese products. If they can creat a good image in solar market, as their products are manufactured and developed in Italy it will be a very good starting for them.
- If MGO Pvt. Ltd. need to make a new decision, modification or change any existing rules and policy first they have to send a proposal to Italy. Then after getting approval from Italy they can make and change their decision. But this is a time consuming process. As a result, they migh loose their potential client just because of their delay in decision making process. This problem can be a threat for them as this problem mey decrease their sales volumn. So, MGO should manage power of decision making and get the authority to make decisions for their business purpose.
- From the result of our market visit analysis I have found out that, most of the Real Estate companies ask for the client list. Here, client list is the list of the Real Estate companies

for whom we already install solar systems. Before making any contract all the Real Estate want to visit and verify our projects we have completed. so its very important for MGO Pvt. Ltd. to enrich their client list by capturing their target customers.

- MGO Pvt. Ltd. should reduce their price of their products and services. Because now a days there are so many companies are entering into the solar market. Even, some Real Estate companies are also starting to manufacture entire solar systems. So, MGO Pvt. Ltd. should follow competitor based pricing strategy. now their current price for solar systems 199 /= taka per watt. From the market analysis I have found out if they can reduce their price upto 150/= taka per watt , then there is possibility to increase their sale.
- A successful national solar energy program is one that will be stable and operating in the medium and long term in order to effectively reach a significant population. In this aim, the sustainability of the financial model should be ensured at various levels- institutional, financial, technical, social and environmental.
- The design of the subsidy policy should be adapted in order to bridge the gap between the full cost of the solar technologies and the willingness and capacity to pay of the poorer. The actual characteristics of the subsidy policy should be long term and carefully designed should be conserved. Adjustments should be made in order to propose products affordable according to the varying willingness and capacity to pay off target populations according to areas' characteristics and equipment types.
- It is important to keep in mind that the role that adequate financial services can play in link with rural electrification goes beyond financing the mere access to solar energy technologies. Appropriate financial services can also be promoted to support the development of renewable solar energy suppliers' activities and to help rural populations take advantage of the new business opportunities created by electrification.
- MGO Pvt. Ltd. should start to use local components for solar systems to reduce price as much as possible. Because, the market situation is going to be changed within few years

when our Government will realize that their purpose of making solar systems mandatory is not fulfilling at all. So MGO should take a survival policy to survive in the market for a certain period and establish themselves as one of the leading solar systems prover in the solar market.

6.Conclusion

There is serious lack of proper campaign and branding to popularize the solar energy in Urban Bangladesh. Solar energy can be a complimentary environment friendly source of power and can play a significant role in reducing current urban power crisis. Government and Private sector should work hand in hand to harness the immense potential of solar energy of Bangladesh.

The whole world is now in an environmental emergency. In addition, as a third world country, Bangladesh has become the worst affected one. Therefore, we have to respond this critical problem quickly. Undoubtedly, renewable energy is the only sustainable solution of these acute problems. It can help us to get our energy security as a strong auxiliary force. Moreover, when we will be able to ensure the adequate investment to promote this sector then infrastructure development, job creation, women empowerment and poverty alleviation will happen automatically. Therefore, it is the high time to address energy insecurity immediately, take visionary planning, attract investment and create mass awareness. It is the policy makers' call to mobilize the whole nation through the right track.

Therefore, as the citizens of United Nations (UN), we all must be aware about renewable energy as a sustainable alternative to get rid of the curse of load-shedding and government must take drastic action for financing, technology transfer, associated policy making and institutional reforms to boost-up this sector and lead the nation to achieve success through a sustainable way.

--End--

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8. Appendix 1

List of Real Estate Companies I have visited during my internship period:

1. Sel Structural Limited
2. South Breeze Housing Limited
3. Kears Limited
4. Brick homes Limited
5. Sheltech Limited
6. Building Design & Technology Ltd.
7. M.H. Propertise Ltd. , M.H. Builders Ltd.
8. Hivertech limited
9. Multiplan Development Limited
10. Ridge Park Holding Ltd.
11. Eastern Housing Limited
12. Ornate Builders Limited
13. Amin Mohammad Foundation
14. Priyo Prangan Properties Limited
15. Union Development
16. Amigo Properties and Developments Limited
17. Navana Group
18. DOM INNO Developments
19. Anwar Landmark Limited
20. Upal and Associats Limited
21. Sun City Builders Limited
22. Neer Limited
23. Shahjalal Property Limited



24. Shaptak Grihayan Limited
25. Protik Developers Limited
26. Adobe Builders Limited
27. Circle Holdings Limited
28. Aster Park Holdings
29. Construction Ecotecture Limited
30. Advantage Holdings Limited
31. Alien Properties Limited
32. Multiplan Limited
- 33.A.B. Development Ltd.
- 34.Akankha Development Ltd.
- 35.Aristo Real Estate Ltd.
- 36.Artisan Home Builders Ltd
- 37.Casero Design & Development Ltd.
- 38.ECO Development & Holding Ltd
- 39.Kingdom Group