




Annual Report

2012

GHEL

Green Housing & Energy Limited

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Foreword

The second year of operations at GHEL has been a year of great development and growth. The company almost doubled in size with respect to the number of employees as well as the value of its assets. GHEL's field presence also got a boost as it is not operating through 80 branch offices nationwide. The past year has seen large investments in customizing and finalizing new renewable energy programs that complement GHEL's established programs and can provide clients with even more attainable solutions to various socio-economic problems of rural life. Through this approach and its cross-sectional products and services, we are confident we have created a new and comprehensive model for rural development.

At the end of the 2011-12 fiscal year GHEL was happy to celebrate the inception of one of its brainchild projects. The Green and Low Cost Housing Program was successfully launched after two years of research and development on housing construction, design and technology as well as the needs of low and medium income people. GHEL's housing project is the first of its kind to cater to the rural population and the soaring popularity of the houses has proven to us that all the hard work and careful preparations will bear fruit. The construction of GHEL's signature houses started in Miradpur Village in the Bogra District, where also the production facilities are located.

GHEL is continuously investing in the development and advancement of its employees and the empowerment of women and other underprivileged groups through organizing technical trainings on renewable energy. Throughout the year GHEL has participated in training of 3,965 partner employees and 8,750 female villagers through its partnerships with ASA, AUP and Citi Foundation. GHEL is also glad to announce that it has established new international partnership to promote its objective of technology and knowledge transfer for sustainable development of the industry in Bangladesh.
As concluding remarks for the year ending June 2012 I must express my gratitude and excitement over GHEL's current situation as it sets an excellent and well deserved starting point for further growth and for reaching the objectives for developing rural Bangladesh.

I would like to show special appreciation for everyone that has worked with us throughout the year as well as to those that have joined us more recently. The growth of GHEL is a testament to the hard work, skill and dedication of its people. In addition I wish to thank our business and funding partners for supporting us and contributing to our work and mission.

Best wishes,

Dr. Mostaq Ahmmed
Managing Director
Green Housing and Energy Limited (GHEL)

Company Information

Company Name: Green Housing & Energy Limited (GHEL)

Web Address: www.ghel.org

Key Person: **Founder and Managing Director:** Dr. Mostaq Ahmmed, an expert in microfinance, SME and Social Business. He is also founder of the Paris based Social Business Think Tank ICMSE (International Center for Microfinance and Social Enterprise), which is creating and building linkage program with Corporate Businesses and Microfinance Institutions.

Date of Establishment: 2010

Registration Number: C 82133/10

Legal Status: Joint Stock Registered Company and Registered at BOI also

Registered Capital: 100 Million BDT

Business Scope: Alternative green and renewable energy answers the scarcity of clean energy and its availability, Low cost housing, SME and Agro-business Development.

Employees: GHEL is presently working in 60 districts around Bangladesh. The total number of employees currently stands at around 300 and over 75% of them are engineers.

Number of Head Office Staff: 35

Number of Field Staff: 250

Number of Rural Women Oriented: 8,750

Number of Branch Offices: 80

Company Overview

Green Housing & Energy Limited (GHEL), is a sister concern of International Center for Microfinance and Social Enterprises Ltd. (ICMSE), which is dedicated to Social Enterprises Development by linking corporate social capital venture funds with new technologies for sustainable development.

Green Housing and Energy Ltd. is getting technical assistance from INES (a French National Solar Institution) and technological support from Taiwan based institute "AFTA Technology". GHEL addresses a range of socio-economic problems amongst low-income people through its renewable energy, housing and capacity building programs.

The Ultimate Goal

1. Overcome the dependency on fossil fuel by offering alternative green energy
2. Comes up with innovative solutions and offering the best and cleanest technology at an affordable price.
3. To contribute to make Bangladesh a role model in renewable energies and sustainable housing projects.
4. The initial and most meaningful goal of GHEL is to ultimately alleviate poverty by offering cross-sectional solutions that support income generation and empowerment of low-income people in Bangladesh:
    - *By reducing energy and electricity expenses*
    - *By supplying and promoting green energy*
    - *By providing low-cost sustainable houses equipped*
    - *SME and Business Development Services*
    - *Skill Training and Capacity Building*
5. Access to modern technology and customized solutions of e- and mobile banking services for isolated low-income people.
6. To invest in agro-business development to increase the productivity of the agricultural sector and secure the livelihoods of farmers as well as future food security.
7. Technology integrated in a smart Business Model combining social impact initiatives, gathered synergies from complementary partnerships and constant low-cost preoccupations lie at the core of GHEL's goal.

Mission: Creating Social Business Projects and Small & Medium Enterprises for fighting poverty.

Vision: Resource Mobilization and Technology Transformation for Creating Social Enterprises.

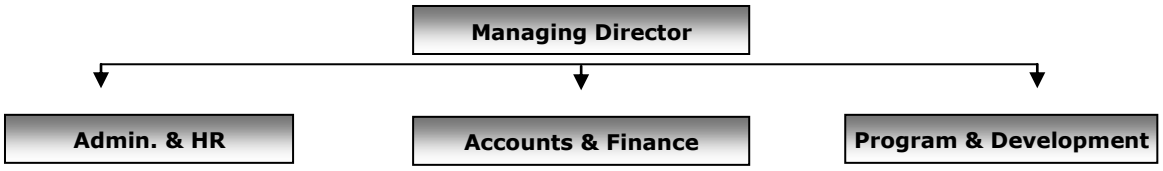
- GHEL has initiated to set up a Battery Production Plant, SME & Business Development Services, and Low Cost Housing Program with other activities.
- Major technologies transformation for producing Solar Module and providing low cost power solutions.
- Collective efforts for drastic carbon emission reduction and community people empowerment in Bangladesh through community plantation program.
- Provide skills training to 10,000 rural women entrepreneurs.
- Setting up a training center for Solar Technicians and Civil Engineers.

Objectives

- To promote, develop and extend renewable energy technologies such as solar power, biogas etc.
- To reduce poverty through creating social enterprises and carrying out campaign for the utilization of energy for productive purposes.
- To train rural women entrepreneurs and introducing affordable technologies for rural people.
- To set up assembling units for renewable energy products and technology
- To set up local production of sustainable construction material and solar batteries
- Offering SME funding and capacity building business development services

GHEL Showroom ASA Tower, Dhaka:
GHEL MD Dr. Mostaq Ahmmed, Mr. Alauddin Ahmed, Md. Shafiqual Haque Choudhury, Mr. Mahbubul Alam, Father Tim and Mrs. Taherunnesa Abdullah, Mrs. Rabeya Akter Choudhury.

Management Structure



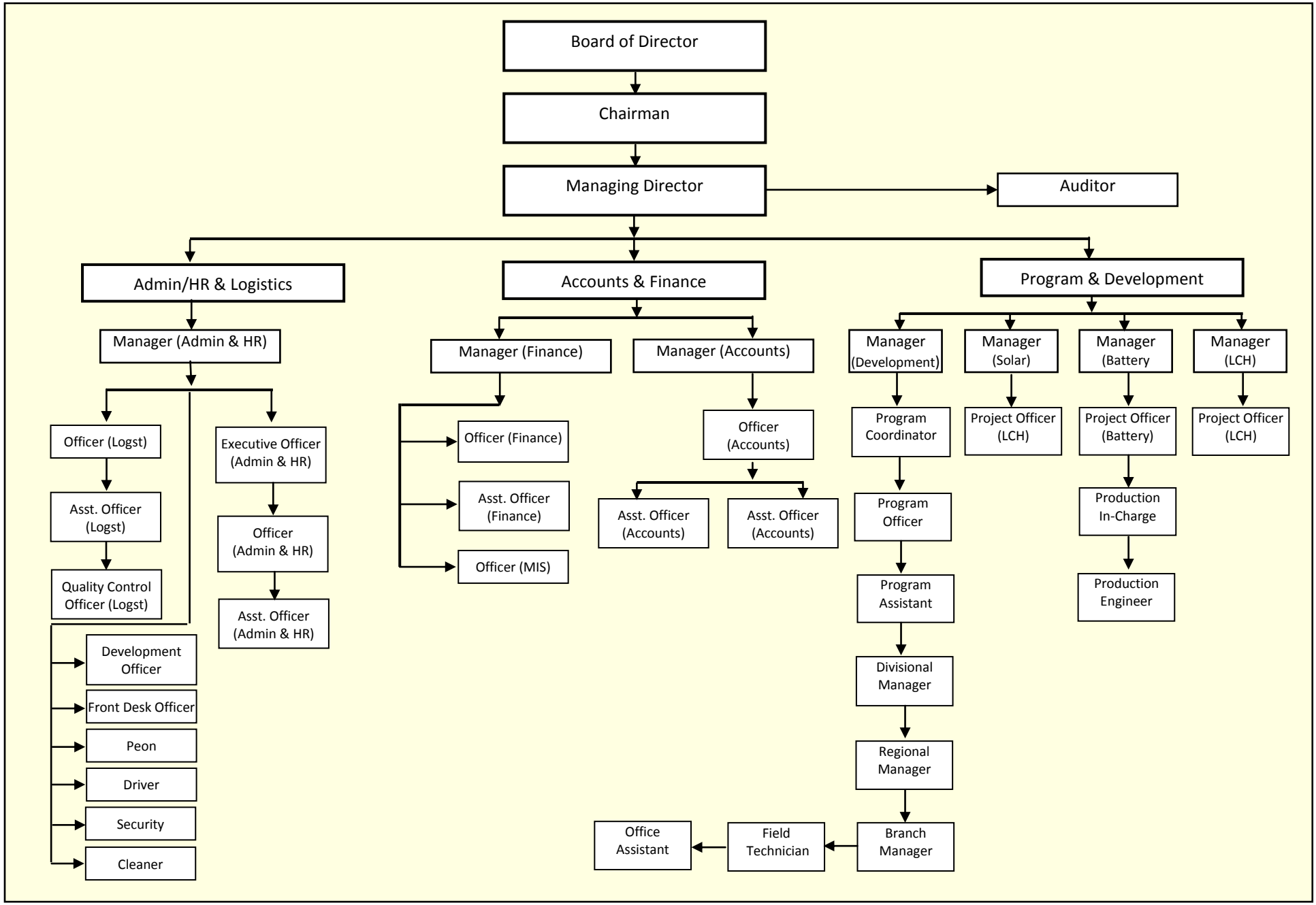
Admin. & HR covers the administrative department, human resources, communications, governance and sustainability.

Companies Accounts and Finance is responsible for internal and external accounting of the organization, financial management & controlling.

Program & Development is responsible for direct contact with the consumers, sells, distribution and production.

Green Housing & Energy Limited

Organogram



Operations

Governance and Monitoring

GHEL has robust governance processes in place for monitoring of its operations on branch, cluster and head office level as well as mechanisms for carefully monitoring its investment objects under the Enterprise Development Program. Top management is continuously developing these processes and mechanisms and the following organs are each involved in monitoring and supervision to make sure all operations follow the corporate policy of conduct.

1. Board of Directors
2. Technical Advisory Team (shadow board consisting of outsiders + MD)
3. Central management team (heads of departments + MD)
4. Central monitoring team (especially appointed company internal monitoring unit)
5. Internal risk management and cost control team (Accounts and Finance Department)
6. Both internal and external auditing answering only to the Board of Directors

Additionally supervision and monitoring of the 80 branch offices is coordinated through 15 regional offices and five cluster heads.

Our Working Area in Bangladesh

GHEL offices are divided into four categories: Head Office, Cluster Head, Regional Office and Branch Office. Currently, GHEL is working in 5 Clusters throughout Bangladesh. Through 15 Regional Offices and 80 Branch Offices, we cover the entire region of Bangladesh and provide support to our customers.

Dhaka Cluster

Regional Office: Dhaka
Branch Offices: Kapasia, Dawlatpur, Raipura, Mawna, Sagardighi.

Regional Office: Mymensingh
Branch Offices: Haluaghat, Mymensingh, Kendua, Nalitabari, Dharmopasha, Fulbaria.

Regional Office: Shylet
Branch Offices: Shunamgonj, Habigonj, Azmeriganj, Tekerghat, Katkhal.

Faridpur Cluster

Regional Office: Faridpur
Branch Offices: Tepakhola, Shakhipur, Shibchar, Kotalipara, Satla.

Regional Office: Khulna
Branch Offices: Morolgonj, Dakope, Sharonkhola, Mongla, Mathbaria, Pathorghata.

Regional Office: Chadpur
Branch Offices: Matlab, Changarchor, Nandonpur, Kalir Bazar.

Chittagong Cluster

Regional Office: Chittagong
Branch Offices: Mirshorai, Shantirhat, Ramgor, Hiako, Sobornochar.

Regional Office: Sandip
Branch Offices: Sandip, Sagoria, Shiberhat, Guptochora, Hatia.

Regional Office: Cox's Bazar
Branch Offices: Dhurung, Kutubdia, Pekua, Ukhia.

Barisal Cluster

Regional Office: Barisal
Branch Offices: Bakergonj, Dhamura, Agalizara, Batazor.

Regional Office: Patuakhali
Branch Offices: Patuakhali, Golachipa, Kalapara, Rangabali, Amtoli, Amkhola.

Regional Office: Mehendigonj
Branch Offices: Hizla, Mehendigonj, Lalmohon, Majhkajirchar, Nalbunia, Tekerhat.

Bogra Cluster

Regional Office: Bogra
Branch Offices: Bottola, Natuarpara, Niamotpur, Godagari, Ullahbharartkhali, Sherpur, Shajahanpur, Chatmohor.

Regional Office: Kurigram;
Branch Office: Patgram, Hatibandha, Tushvander, Trimohini, Pochakata, Kawnia.

Regional Office: Jamalpur
Branch Offices: Kalihati, Bakshigonj, Melandhaha, Dewangonj, Sanondobari.

GHEL Location

Human Resources

GHEL operates through 80 branches and 15 regional offices in 65 of the country's districts. The Dhaka Head Office employs 35 people while almost 250 people are employed in the field operations.

GHEL Senior Management:

Name	Designation
Dr. Mostaq Ahmmed	Managing Director
Alamgir Hossain	Program Manager
Md. Afser Hossain	Head of M&E, SME in-charge
Rashidul Akhter Maruf	Accounts Manager
Md. Abullah Al Faruk	Head Of Logistic & Control Monitoring
Ayesha Nargish	Head of HR & Administration

GHEL Regional Managers by region:

Region	Regional Manager
Bogra	Mrittunjoy barman
Bogra (Biogas)	Shahinur Islam
Chadpur	Shirazul Islam
Dhaka	Md.Mokaddes Ali
Jamalpur	Md.Jamiur Rahman
Khulna	Shafiqul Islam
Kurigram	Md.Sharif Hosain
Mehendigonj	Md. Fayej Ullah
Mymanshing	Md.Ashraful Islam
Patuakhali	Mahabub Alam
Sylhet	Md.Salek Miah

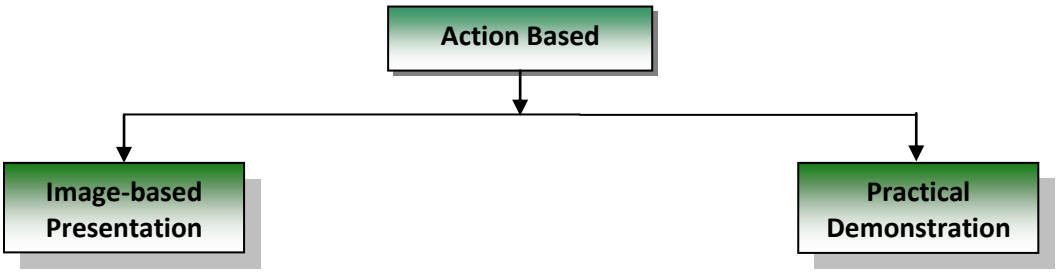
Senior and regional management has regular meetings to evaluate performance and to determine the course of operations. GHEL is constantly developing its staff through training sessions and on the job training. Developing the skill of our human resources is and will remain a driving factor in GHEL's strategy both for internal program development but also to be able to assure the best technical training and orientation for our clients.

Training and Technical Support

GHEL offers a variety of training programs designed to help management, officials and front line staffs learn more about Microfinance, SME, Agro-businesses and Solar Energy technical and operational issues. The Managing Director of GHEL Dr. Mostaq Ahmmed is highly reputed Training Expert who has taken initiative for strengthening Training and Technical Support Department of GHEL. For the smooth functioning and effective coordination of all the GHEL clients' service center, GHEL Management/Technical Team are providing leadership training courses for ensuring quality management at the field level operation since solar training is critical because solar energy is such a broad, deep and often misunderstood topics. To date GHEL has organized 650 training sessions. During these sessions GHEL has provided training to 3,965 ASA staff and 8,750 rural women.

Training Methodology

The trainings are based on action based learning and under the action based there are two wings one is (i) Image-based presentation which training designed especially for those people who are not literate. The other one is (ii) Practical demonstration and it focuses on flip chart presentation along with learning by doing approaches.



Objectives

- To ensure some technical skill training for rural female entrepreneurs on business development, income generating activities and solar system to develop their technical know-how for improving their business entities and the economical condition as well.
- To ensure sustainable rural SME and enterprises development and sound operation of the energy utilities.
- To encourage public and private sector participation in the development and management of the microfinance, SME and energy sector.
- To provide better and effective service to the customers

Awareness & Campaigning Activities

Through leaflet, brochure and poster GHEL is doing their campaigning activities in rural areas. The GHEL trainings are an integral part of the company's awareness and promotion activities. GHEL is aiming to increase the awareness of the social, economic and environmental impact of its different products and services as well as to educate the clients and the staff of partner organizations on renewable energy technology.

Partnership Agreement with IDCOL

About IDCOL

Infrastructure Development Company Limited (IDCOL) was established on 14 May 1997 by the Government of Bangladesh (GOB). The Company was licensed by Bangladesh Bank as a non-bank financial institution (NBFI) on 5 January 1998. Since its inception, IDCOL is playing a major role in bridging the financinrg gap for developing medium and large-scale infrastructure and renewable energy projects in Bangladesh. The company now stands as the market leader in private sector energy and infrastructure financing in Bangladesh.

IDCOL is managed by a seven-member independent Board of Directors comprising four senior government officials, three prominent entrepreneurs from the private sector and a full time Executive Director and Chief Executive Officer. It has a small and multi-skilled work force comprising economists, financial and market analysts, engineers, lawyers, IT experts and accountants. IDCOL's stakeholders include the government, private sector, NGOs, multilateral institutions, academics and the people of Bangladesh at large.

GHEL has signed up a participation agreement with IDCOL for refinancing its Solar Home System Program and under this agreement GHEL will get the credit support for 10 years time period at the rate of 6% for as many as Solar System GHEL could installed. Along with that GHEL has honored to have a sectioned letter of 150 million BDT loan support for its battery production plant.

International Business Partners

INES, ICD, EDHEC and HEC, Woord en Daad, Citi Foundation, Sigmatns Co. Ltd.

Local Business partners

ASA, IDCOL

Other Partners

AFTA, UN Sustainable Energy for All

Featured Projects and Business Units

GHEL Low Cost Housing

GHEL believes that housing solutions specifically designed for rural living conditions will have a significant impact on the economic situation and social status of families. The durability of GHEL Low Cost Housing as well as the affordable prices and customized mode of payment corresponds perfectly to the needs of low and middle-income people living in rural areas in Bangladesh.

In addition to providing comfortable living conditions, the houses are designed to be suitable to accommodate home grown businesses. The aim is to increase inhabitants' living standards as well as to foster their productivity by providing them facilities in which to set up their own SMEs.

Benefits of GHEL Low Cost Housing

- GHEL Low Cost Housing benefits from a **higher durability and longevity** than traditional houses. All the parts are prefabricated and the structures are of extremely **good quality**.
- The houses are **eco-friendly and resistant to changes in weather** since they are built with concrete blocks made from cement, sand and stones
- Designed for low-income people, GHEL Low Cost Houses are **40% cheaper** than traditional houses.
- The houses are seismic **shock-absorbing and solid** enough to endure earthquakes and cyclones.

Features of GHEL Low Cost Housing

All our houses are equipped with eco-friendly sanitation and water purification system. The GHEL Solar Home System and the GHEL Biogas Plant can be integrated in the houses to further decrease environmental impact and offer savings in living expense.

Customized payment plan

In order to make the project financially viable and attainable to its clients, GHEL offers a payment plan consisting of the following options (more details in the table below):

20% down payment at the time of order
20% at the completion and handover of the house
60 % in monthly instalment over a period of one to eight years

Once the clients have completed all the payments as per contract, the ownership of the house and all its facilities is transferred in full to the client.

Size of the houses	Cash price	Number of monthly install-ments	Total price
350 ft²	287,000	12	321,440
		24	355,880
		36	390,320
		48	424,760
		60	459,200
		72	493,640
		84	528,080
		96	562,520
500 ft²	414,000	12	463,680
		24	513,360
		36	563,040
		48	612,720
		60	662,400
		72	712,080
		84	761,760
		96	811,440
600 ft²	483, 000	12	540,960
		24	598,920
		36	656,880
		48	714,840
		60	772,800
		72	830,760
		84	888,720
		96	946,680

Size of the houses	Cash price	Number of monthly install-ments	Total price
800 ft²	672,000	12	752,640
		24	833,280
		36	913,920
		48	994,560
		60	1,075,200
		72	1,155,840
		84	1,236,480
		96	1,317,120
1000 ft²	840,000	12	940,800
		24	1,041,600
		36	1,142,400
		48	1,243,200
		60	1,344,000
		72	1,444,800
		84	1,545,600
		96	1,646,400

GHEL Construction Material

Besides GHEL Green Low Cost Housing program, GHEL set up a factory to produce its own blocks used for the construction of the houses. Blocks differ from traditional bricks since they are not burned in ovens. Government and development organizations have recently fostered the use of blocks in order to cut carbon emissions, the main global warming pollutant. The blocks offer numerous advantages listed below.

- Blocks do not need to be cured in ovens. **The carbon footprint is thus reduced and forests are preserved.**

- Blocks are **fire resistant, seismic shock-absorbing and solid** enough to endure cyclones**.**

- The **production process is easier** than brick-making since blocks are not burned in ovens.
- The blocks have an **appealing aesthetic** with an elegant profile and offer endless number of architectural design.

On top of that, the setting up of block production units in rural areas will fill the lack of sustainable and quality materials for constructions. Not only will the blocks be used for the construction of GHEL Green Low Cost Housing, but also for educational, medical, agricultural and business facilities. GHEL strongly believes in its mission to lay the first stone of the village of tomorrow so as to improve the quality of life of low-income people and protect the environment.

GHEL Solar Home System

The GHEL Solar Home System is designed to provide the household with a complete set of solar energy products to cater to the energy need in rural and semi-urban areas. The GHEL Solar Home Systems are customized for low to medium income house- holds and can power lights, fans, phone chargers, radio and TV depending on the power capacity and the client's requirements. The GHEL Solar Home Systems have already proven a success in the market with 10 000 satisfied customers around the country. Additionally GHEL has distributed 6 000 Solar Lanterns of 5W for lighting rural households.

Benefits of GHEL Solar Home System

By using solar energy for electricity households get to enjoy the health and cost benefits of renewable green energies as opposed to fossil fuels. Home production of energy reduces the dependencies on the unreliable — or in remote areas unavailable — national electricity grid. This way, houses can stay lit after dark, allowing for more time spent on studying and an increase in productivity for home grown businesses. Thus, improved energy supplies have direct benefits on business productivity and education levels of rural households.

Components of the GHEL Solar Home System

The GHEL Solar Home System consists of a solar panel, a solar battery, a charge controller, an inverter and low-energy lights. Depending on the electricity need of the client GHEL offer Solar Home Systems ranging from 20 to 120 watt.

Solar panels must be mounted on stable constructions and at an optimal angle to the sun. GHEL technicians will assess the correct positioning of the panel and install the panel and the mounting rack accordingly. The installation and training on use and maintenance are all included in the price of the GHEL Solar Home System.

Range of GHEL Solar Home Systems

Power	Capacity	Price (BDT)
75 Wp	6 tube lights 1 B/W TV, 17"	40,300
80 Wp	6 tube lights 1 phone charger 1 B/W TV, 17"	42,000
85 Wp	8 tube lights 1 phone charger 1 B/W TV, 17"	44,600
100 Wp	9 tube lights 1 phone charger 1 B/W TV, 17"	57,000
120 Wp	10 tube lights 1 phone charger 1 B/W TV, 17"	64,400

Power	Capacity	Price (BDT)
20 Wp	2 CFL lights 1 tube light	12,900
40 Wp	3 tube lights 1 B/W TV, 14"	23,400
45 Wp	4 tube lights 1 color TV, 14"	25,000
50 Wp	5 tube lights 1 B/W TV, 17"	29,300
60 Wp	5 tube lights 1 B/W TV, 17"	34,200
65 Wp	5 tube lights 1 B/W TV, 17"	35,800

GHEL guarantees high quality of its Solar Home Systems with competitive warranties for all components. Maintenance for the GHEL Solar Home System is provided free of charge by trained local GHEL technicians for 3-5 years depending on the component.

Product	Warranty
Solar Panel	20 yrs
Battery	5 yrs
Charge Controller	3 yrs
Other accessories	1 yr

GHEL Solar Lantern

GHEL Solar Lantern is a lighting system composed of a lamp, a rechargeable battery and a solar panel. Easily of use: the battery is simply charged through the PV module, and then, used to power the LED lights inside the lantern. Our lanterns are portable and suitable for either indoor or outdoor lighting.

Our solar lanterns are a clean, cheap and reliable alternative to traditional lanterns (fuelled by kerosene or gas), candles and torchlights. Environmentally speaking, solar lanterns do not emit carbon dioxide, the main global warming pollutant. They are safe both for the user and the environment: no risk of burn or fire. Finally, solar lanterns are the cheapest source of energy on the long range. Indeed, people in rural Bangladesh spend an average of 12-15 BDT per day on kerosene while a solar lantern has a total cost of 2500 BDT. Considering an interest rate of 12% on the repayment plan offered in conjunction with the product, the solar lantern is amortized within only 200 days.

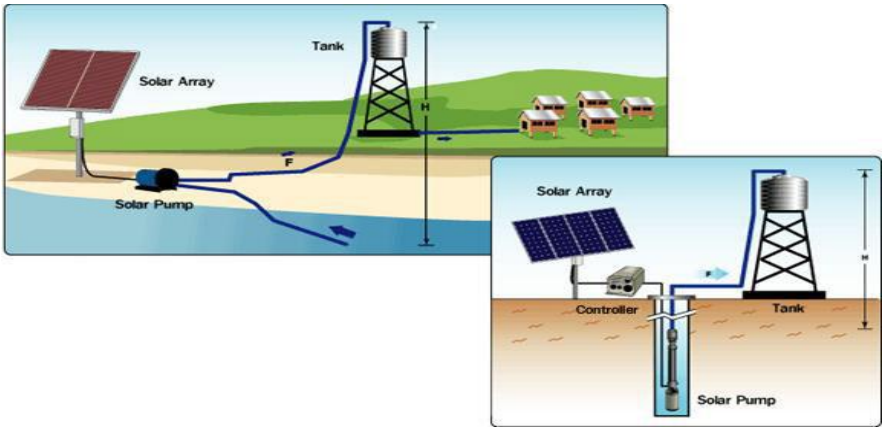
GHEL Solar Lantern System	• Portable lighting device • LED technology lighting • Suitable for indoor and outdoor lighting • Includes a phone charging application • Covers a range of 360° • Two different models of 5W each
Charging Time	6 hours
Duty Cycle	Min 5 hours per recharge
Lifespan	5 years
Warranty	Lantern 3 years Battery 1 year
Price	2 500 taka

GHEL Solar Water Pump

The solar powered pumping system consists of a solar panel that powers an electric motor, which in turn powers a bore or surface pump. The water is pumped from the ground or stream and stored into a raised tank.

GHEL Solar Water Pump can be used for two purposes, namely agriculture irrigation and pure drinking water supply. In fact, solar water pumps offer a cheap and clean alternative to diesel pumps for farmers located in remote areas. GHEL Solar Water Pump has a

capacity of 600,000 L/day, that is to say enough to supply a 120-bigha land.
On top of that, GHEL Solar Water Pump can be installed in a house to provide its household with purified drinking water. The water quality is tested by GHEL and the maintenance of the construction is provided by our experts. The household can access running drinking water up to six hours a day (based on a daily solar recharge of eight hours).



GHEL Biogas

GHEL has launched a Biogas Plant Program in Bangladesh to address the pressing need to adopt wide-scale use of clean alternative sources of fuel for cooking. The ultimate goal of GHEL's Biogas Plant Program is to offer low cost green and alternative source of energy for everyday household needs.

Benefits of GHEL Biogas

- Biogas is a **eco-friendly** source of energy,
- Beneficiaries experience long term **health benefits**
- More **affordable source of energy** (compared to e.g. kerosene and wood) in the medium to long term

In addition, the capacity of bigger GHEL Biogas Plants can produce both gas for cooking and electricity to power a generator. The Biogas Plants also support income generation since the excess production of gas can be distributed to other households. The byproduct—bio-fertilizer—can be collected and provide the household with a valuable additional income.

GHEL targets all those rural households currently using traditional health and environmentally hazardous fuels for cooking purposes. Women and children are disproportionately affected by diseased related to indoor air pollution due to their household responsibilities. Additionally GHEL is working to serve the low-income population and to increase the affordability of green energy technology to these people.

GHEL provides its clients with a customized financial solution with a 10 %-20% down payment and additional monthly installments for a period of 2-3 years.

Types of Biogas Plants

GHEL offers two types of Biogas Plants according to the client's need:

1. The GHEL Biogas Plant for household cooking purposes

Size of the plant	*Kg of cow dung needed*	*Biogas production (h)*	*Price (BDT)*
1.6 m^3	40-50 (4 cows)	3-4	**27,000**
2.0 m^3	50-55 (6 cows)	4-5	**30,000**
2.4 m^3	60-65 (7 cows)	5-6	**33,000**
3.2 m^3	80-85 (10 cows)	6-8	**39,000**
4.8 m^3	120-130 (14 cows)	10-12	**45,000**

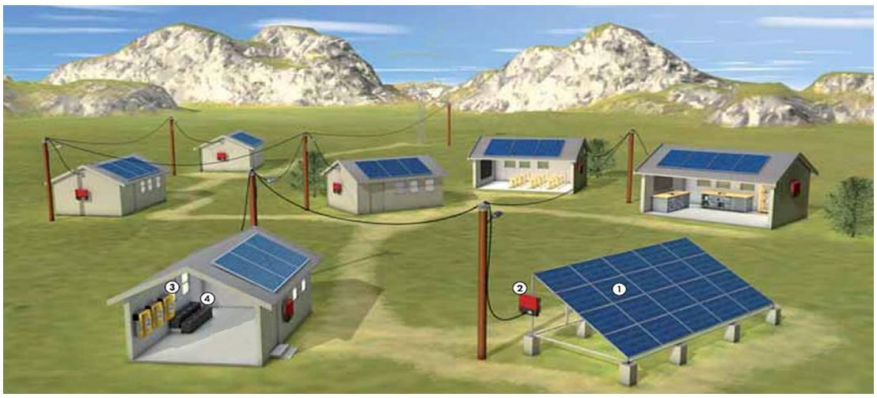
2. The GHEL Biogas Plant for industrial purposes

GHEL can design and provide Biogas Plants of any size depending on the client's needs and capacity.

GHEL Mini Grid

About the program

The GHEL Mini Grid is an off grid solar energy system managed by GHEL. The GHEL Mini Grid is installed in villages with a collective need of electricity of at least 100 kW. Through the GHEL Mini Grid, electricity is generated from solar energy and distributed to participating households. A power capacity of 100 kW can provide 500 households with six hours of electricity per day. The infrastructure of the GHEL Mini Grid gives participating households the option to sell excess electricity onwards to third party households. GHEL supports this kind of secondary distribution – by so called GHEL Power Ladies – as it can increase the efficiency and socio-economic benefits of the GHEL Mini Grid and provide the GHEL Power Ladies with an additional source of income.



The technology for the solar panels, charge controllers and inverters are imported from GHEL's trusted international partners. GHEL ensures the highest quality of sensitive technologies used for controlling and monitoring the generation and distribution of power. The GHEL Battery Plant produces the batteries locally under strict quality control to ensure first-class and long term quality of these components.

The GHEL Mini Grid is suitable for the landscape and weather conditions in most of Bangladesh since it relies on sunlight to produce electricity. GHEL nominates the suitability of the GHEL Mini Grid in a village based on the number of households in need of electricity. A GHEL Mini Grid of 100 kW will provide energy to 500 households within proximity of 2-4 km from the plant.

Benefits of GHEL Mini Grid

The benefits of GHEL Mini Grid are the same as GHEL Solar Home System.

- Long-term **health benefits** of clean energy
- A **cheaper** long-term source of electricity
- **Increased number of hours** for working and studying
- **Increased productivity, income and education levels** of the population in rural areas
- **Decrease national dependency** on fossil fuels and decrease the levels of carbon emissions

GHEL Smart Micro Grid

About the program

The GHEL Micro Grid is a hybrid construction of an off grid solar energy system and a biogas production plant. Compared to the GHEL Mini Grid the power capacity of the GHEL Smart Micro Grid is lower, ranging from 30 to 50 kW. The additional GHEL Biogas Plant for collective use also provides participating beneficiaries with clean and affordable fuel for cooking purposes. The 30 kW GHEL Micro Grid can provide energy for up to 250 households or 1250 beneficiaries.

Biogas is a bio fuel which originates from the biological breakdown of organic matter in the absence of oxygen. Biogas offers a clean alternative to traditional cooking methods. Input capacity for the GHEL Biogas Plant (measured by number of cows and amount of feces and waste) must be high enough in the village for its viable implementation. Generally, twelve cows producing 100 kg of cow dung can generate enough biogas for nine hours of cooking.

The GHEL Smart Micro Grid requires the land area to be suitable for the installment of the GHEL Biogas Plant. For a village to be nominated for the installment of the GHEL Smart Micro Grid, a demand for electricity and biogas for a minimum of 50 households is needed to meet the supply from the 30 kW plant.

Benefits of Biogas

The benefits of GHEL Smart Micro Grid are the same as GHEL Solar Home System and GHEL Biogas.

- **Eco-friendly** source of energy
- Long term **health benefits** for beneficiaries
- **More affordable** source of energy (compared to e.g. kerosene and wood) in the medium to long term

The Biogas Plants also support income generation since the excess production of gas can be distributed to other households. The byproduct—bio-fertilizer—can be collected and provide the household with a valuable additional income. A Village Waste Management Program can secure the input for biogas production as waste is collected from the village beneficiaries in exchange for biogas credits.

GHEL Enterprise Development

Taking a step beyond grass root poverty reduction, GHEL has introduced an Enterprise Development program as a response to the need of capacity building within the SME sector. The program mobilizes capital and consultancy expertise to be channeled to SMEs that currently do not have access to this kind of support. The GHEL enterprise development model has four key components:

1. **Equity or debt financing by GHEL**
2. **Skill training by industry experts and consultants**
3. **Technological and operational support systems**
4. **Legal, administrative and market support**

The GHEL Enterprise Development program targets SMEs in a broad range of industries. Through its 80 branch offices in rural and semi-urban areas, GHEL is well equipped to assess the market potential and valuation of ventures in an overarching range of sectors and regions. Each branch carefully reviews local entrepreneurs and SMEs and nominates the most viable ventures to the GHEL head office. A skilled team of SME development experts then evaluates the business opportunities and allocates equity of 300,000 to 7,000,000 BDT (corresponding to 20-50 % of total equity capital) or debt funding to the most promising prospects.

Prospective industries include:

Agro-business
Pathology and Diagnostic Institutions
Housing and construction
Hospitality
Engineering and workshops
Food processing and preservation
Land development
Mini garments
Retail and wholesale
etc.

GHEL is committed to making a real impact in SME development and industrialization by offering comprehensive value adding support. GHEL aims to facilitate both domestic and international expansion of its investment objects. This objective will be met by continuously offering the following value adding support:

Value adding activity	Components	Objective
Skill training	Individual training, knowledge and capacity building through workshops, consulting and introduction of industry best practice.	Improving and developing competitive advantages and encourage innovation.
Technology transfer	Technology development for key business activities and introduction of software and advanced technologies for supporting activities.	Increasing professionalism, productivity and efficiency.
Legal support	Education on legal issues and ownership structures, assistance in incorporation, expert legal advice and auditing support.	Facilitating business operations, competition and employment (especially with regards to expansion).
Market research	Raising awareness of domestic and international market research (customer, industry, partner and competitor research).	Strategy development and market focused management.
Administrative support	Skill and human resource training, recruitment support, software introduction and training, introducing viable options to admin management (such as outsourcing).	HRM, streamlining operations, allowing management to focus on key business drivers.

GHEL Battery Plant

The backbone of most power storage system is battery. An electric Battery is “any machine that storage energy into electricity for transmission and distribution.”

GHEL battery plant will produce all kinds of solar batteries that will be suited to our solar lanterns, home systems, tricycles and water pumps as well as other solar products that require battery. The production capacity of the plant amounts 3300 pieces per month if run one shift (8 to 10 hours).

Plant Size

Plant will be built on a 5 Bigha land which cost has estimated amounts 3.30 Crores BDT and which will be located in the surroundings of Dhaka (in Gazipur). The plant requires 102 employees for production and 18 for corporate office.

Battery Produced

The GHEL has made a clear technical plan to produce following categories of the batteries as per the Market Demands and it must have composed of three assembly lines:

- One small VRLA battery (55AH) assembly.
- One VRLA battery (80AH) assembly line.
- One 100AH battery assembly line.
- And one 130AH battery assembly line.

All the batteries are designed and destined to be used for solar panels.

Predicted Quantity of Production

The maximum capacity of production is of 3711 units per month and we intend to reach this point after two years of activity. First, we intend to produce 75% of our total capacity during the first year of activity, and then we will be able to produce 85% during the second year. And only during the third year of our performances, we will use our full capacity which will allow us to produce maximum 3711 units per month.

Projections of Yearly Production Plan

	Year 1	Year 2	Year 3
Total capacity production	44,529	50,467	59,372
Effective production	75%	85%	100%
Quantity produced	33,397	42,897	59,372

Different Categories of the Yearly Batteries Production Plan

	product 1	product 2	product 3	product 4
Type	55AH	80AH	100AH	130AH
Quantity	11,132	11,132	11,132	11,132
Unit production cost(BDT)	4 760	5 950	7 843	8 400
Total production cost (BDT)	52,988,320	66,235,400	87,308,276	93,508,800
Selling price (BDT)	6 800	8 500	10 195	12 000
Total sales (BDT)	75,697,600	94,622,000	113,490,740	133,584,000
Unit margin (BDT)	2 040	2 550	2 352	3 600
Total margin (BDT)	22,709,280	28,386,600	26,182,464	40,075,200
Gross profit ratio	30%	30%	23%	30%

Improved Cook Stove

The main source of energy used for cook stove is currently wood and kerosene, which are sources of indoor air pollution and therefore many diseases.

By providing Improved Cook Stove, GHEL wants to improve the health conditions of its consumers and also to allow them to reduce their fuel costs by two.

GHEL Solar Accessories and Battery Optimizers Company Products

GHEL has started importation, assembly and distribution of solar accessories and modern renewable energy technology such as new generation LED lights and battery optimizers. These initiatives are part of a joint venture and partnership with Korean technology company Sigmatns Co. Ltd. The objective of this partnership is to import patented technology for the renewable energy sector and to initiate technology and knowledge transfer into Bangladesh

Citi—GHEL Solar Project for Rural Microenterprises

Bangladesh is suffering from a severe energy crisis which has proven one of the key hurdles to economic and social development. Since the national grid is inaccessible to 70 % of the nation's rural regions increased use of alternative energies is perhaps the only realistic solution to the energy shortage. The Citi—GHEL Solar Project for Rural Microenterprises was introduced in 2011 in selected villages around the country to give these communities access to electricity. The program was initiated by AUP, financed by Citi Foundation and executed by GHEL. The objectives of the project were kept in line with the key focus areas of Citi Foundation – the development of micro entrepreneurs and microenterprises.

Objectives

- Direct support to microfinance clients by offering Solar Home Systems by which their families would have increased access to electricity.
- Enterprise development support to micro entrepreneurs by providing them training to enable the acquisition of new skills – making their businesses more productive and raising the income level of the entrepreneur.

Together with the Solar Home Systems, GHEL provided free training on their installation, functions and maintenance to women from remote rural locations. This approach allowed for further female empowerment – both economic and social – through additional income generating activities.

Target population

The beneficiaries of the program have been mainly micro entrepreneurs and their households. The initiative targeted the villages of Motlab and Changarchor in Chadpur District. These villages did not have access to the national electricity grid which severely restricted the people and the local entrepreneurs in their daily activities and business development efforts. Households in selected villages were provided with 20W Solar Home Systems and micro enterprises with 40W Solar Home Systems in order for them to be able to extend their business hours. The solar home systems are distributed to 141 microenterprises and 369 rural households.

Key activities

1. **Distribution of Solar Home Systems for microenterprises (40 watt)**
2. **Distribution of Solar Home System to microentrepreneurs (20 watt)**
3. **Training of women on the installation and maintenance of Solar Home Systems**
4. **Campaigning and raising awareness on the benefits of using alternative energy in order to minimize the dependency on non-renewable energy**

Annexure

Annexure 1: Balance Sheet

Green Housing and Energy Ltd.

Balance Sheet

Assets	Note	As at June 30, 2011	As at June 30, 2012
A) Tangible Fixed Assets	**1**		
Land		19600000	21006000
Land Development		23501	9073381
Furniture and Fixtures		956786	934278
Office equipment		324858	611055
Vehicle		1480902	2544722
Mobile Phone		2250	1688
Demo House		691487	674200
Water Pump		6800	5440
Air Conditioner			38096
Bi- Cycle			4425
Genarator			109250
Block Making Machine			1039850
Sundry Assets			2249
Total Tangible Fixed Assets		**23086584**	**36044633**
B) Preliminary Expenses		**146594**	**146594**
C) Current Expenses			
Adances and deposits		276132	952 515
Accounts receivabl/ Outstanding	**2**	45670894	125 671 443
Stocks and Stores	**3**	25384490	41 339 480
Current Account with ASA		355500	325 500
Current Account with Projects	**4**		(23 581 181)
Cash and Bank Balances	**5**	4093268	13 282 768
Total Current Expenses		**75780284**	**157990525**
		99013462	**194181751**
A) Share Capital			
ASA		200000	0
DR. Mostaq Ahmmed		500000	5800000
ICMSE		300000	300000
Ms. Rafiza Rahman			200000
Total Share Capital		**1000000**	**6300000**
B) Land Revaluation		**10963516**	**10963516**
C) Profit and Loss Account		**18188392**	**12329567**

D) Liabilities for goods/Bills Payable	**6**	**37718632**	**45606375**
E) Liabilities for expenses		**3488755**	**2249448**
F) Loan Loss Provision			**1256715**
G) Liabilities for Finance			
Loan from Mercantile Bank Ltd		10018977	25901605
Loan from MD			5314131
Loan Interest Payable			953335
Loan from IDCOL		17228460	82629899
Security Deposit		406730	677161
Liabilities for Finance		**27654167**	**115476131**
		99013462	**194181751**

Annexure 2: Profit & Loss Statement

Green Housing and Energy Ltd.

Profit and Loss Account

	As at June 30, 2011	As at June 30, 2012
Revenue		
System Sales	89 636 494	103 703 082
System service charge	8 565 989	3 314 384
A) Total Revenue	**98 202 483**	**107 017 466**
Less : Cost of Goods Sold		
Purchased durig the period	94 351 787	125 718 680
Less : Closing Stock	25 384 490	41 339 480
System available for sales	68 967 297	84 379 201
Less : Grant - IDCOL	4 151 690	4 974 440
B) Cost of Goods Sold	**64 815 607**	**79 404 761**
C) Gross Profit (A - B)	**33 386 876**	**27 612 706**
Others Income		
Bank Interest	96 429	16 365
Loan Interest /Margin Mercantile Bank	15 408	50 000
Try Cycle rent	3 000	
Carrying Cost (ASA)	47 200	
Battery Repairs & Maintenance		24 500
Othrs		35 750
D) Total Others Income	**162 037**	**126 615**
Total Income (C+D)	**33 548 913**	**27 739 321**
A) Office and administrative Expenses	**13 597 552**	**31 570 099**
B) Other Expenses	**1 092 554**	
Loan Losse Expenses		1 256 714
	1 092 554	**1 256 714**
C) Depreciation	**554 042**	**887 705**

Total Expenses (A+B+C)	**15 244 148**	**33 714 519**
Net Profit for the period	**18 304 765**	**(5 975 198)**
Cumulative Profit /Loss Account	**18 304 765**	**12 329 567**

Office and administrative Expenses

Particular	HO	Branch	Total
Advertisement	139887		139887
Audit Fee	17000		17000
Bank Charge	204492		204492
BM Meeting TA/DA	23677		23677
Board of Investment	38230		38230
Carring inword	12997		12997
Carring Outword	772661	285824	1058485
Conveyance	50901		50901
Contengency/ Miscellinius	76710		76710
Curiar Bill	63759	89400	153159
Consultant Fee	122798		122798
Entertainment	53789	235824	289613
Fuel & Octane	56452		56452
Gurage rent	22000		22000
Incentive	81500		81500
Internet Bill	61957		61957
ISP Charge	3989		3989
International Roaming Bill	15638		15638
Idcol Workshop	23400		23400
Insurance Premium	1184		1184
Joint stock Expenditure	46452		46452
Legal Expenses	66000		66000
Labour Bill	2000		2000
Licence Fee	20000		20000
Loan Interest	1803946		1803946
RM Meeting Expense	106009		106009
Mobile Bill	101098		101098
Money transfer bill	207111	463080	670191

Office maintenance	100604	237648	338252
Office Rent	907200		907200
Service Charge (Office Rent)	72000		72000
Over Time	2000		2000
Packing Materials	13700		13700
Paper & Periodicals	3090	76776	79866
Photocopy	12365	285360	297725
Postage & Stamp	18054	149532	167586
Professional Rating fee	60000		60000
Car/Truck Repair & maintenance	35474		35474
Office Repair & maintenance	60345	252804	313149
Recruitment Expenses	582		582
Remuneraion	900000		900000
Registration & Renew	25915		25915
Salary	3056187		3056187
Staitionary	330101	218560	548661
System Repair & maintenance	1168459		1168459
T&T Bill	14831		14831
TA/DA	138742		138742
Tax / Income Tax	333063		333063
Training Expense	5755	37465	43220
Vehicle Rent	180000		180000
Vat	10033		10033
Water, Gas & Electric Bills	138598	227376	365974
Branch, Office Rent	1347400		1347400
Branch, Salary	9328605		9328605
Branch, Mobile Bill	144999		144999
Branch, TA / DA	2518481		2518481
Branch Petty Cash	639380		639380
Cost for Bio-Gas		3230935	3230935
Branch Bank Charge	6193		6193
Money transfer bill (Br)	11722		11722
Total	**25779515**	**5790584**	**31570099**

Annexure 3: Note – Fixed Assets

Green Housing and Energy Ltd

Fixed Assets as on June 2012

Note - 1

Particulars	COST			Rate	Depreciation			Written down Value
	Balance As on 01.07.2011	Addition During the Period	Total As on 30.06.2012		Balance As on 01.07.2011	For the Period	Total As on 30.06.2012	As on 30.06.2012
Land	19 600 000	1 406 000	21 006 000	-	-	-	-	21 006 000
Land Development	23 501	9 049 880	9 073 381		-	-	-	9 073 381
Furniture & Fixture	462 655	81 300	543 955	10 %	46 265	49 769	96 034	447 921
Furniture & Fixture (Branch)	600 440		600 440	10 %	60 044	54 040	114 084	486 356
	1 063 095	81 300	1 144 395		106 309	103 809	210 117	934 278
Office Equipment	382 185	394 030	776 215	15 %	57 327	107 833	165 160	611 055
Vehicle	1 851 128	1 700 000	3 551 128	20 %	370 226	636 180	1 006 406	2 544 722
Mobile	3 000	-	3 000	25 %	750	563	1 313	1 688
Demo House	709 217	-	709 217	2,50 %	17 730	17 287	35 017	674 200
Water Pump	8 500	-	8 500	20 %	1 700	1 360	3 060	5 440
Air Conditioner	-	50 794	50 794	25 %	-	12 699	12 699	38 096
Bi- Cycle	-	5 900	5 900	25 %	-	1 475	1 475	4 425
Genarator		115 000	115 000	20 %	-	5 750	5 750	109 250
Block Making Machine		1 039 850	1 039 850	20 %				1 039 850
Sundry Assets	-	3 000	3 000	25 %	-	750	750	2 249
Total	**23 640 626**	**13 845 754**	**37 486 380**		**554 042**	**887 705**	**1 441 747**	**36 044 632**

More Information on:

www.ghel.org

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