

Green Housing & Energy Limited

Dedicated to Sustainable Social Business



GHEL Solar Home System

GHEL

Green Housing and Energy Ltd. (GHEL) is a social impact business dedicated to combating poverty through empowering low income people and making a better living environment available to them. GHEL is supporting underprivileged people to improve their living conditions through raising their levels of health, education, employment and income. By offering a wide range of customized products and services to an affordable price GHEL is targeting the socio-economic problems of green energy supply (solar/biogas), housing, water supply, enterprise development and capacity building. GHEL has established a platform where investors can participate in social impact business projects through equity investments and technology transfer for achieving real impact in community development.

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 for the energy need in rural and semi-urban areas. The GHEL Solar Home Systems are customized for low to medium income households 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

- Long-term health benefits of clean energy
- A cheaper long-term source of electricity
- Possibility to extend working hours and more time for children to do homework after dark
 - Increased productivity, income levels and level of education
- Warranties, free maintenance and technical assistance from skilled GHEL technicians for all components of the 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 supply have direct benefits on business productivity and education levels of rural households.

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COMPONENTS OF THE GHIEL SOLAR HOME SYSTEM

The GHIEL Solar Home System consists of a solar panel, solar battery, charge controller, inverter and low-energy lights. Depending on the electricity need of the client GHIEL 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. GHIEL 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 GHIEL Solar Home System.

Range of GHIEL Solar Home Systems:

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

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

WARRANTIES AND QUALITY CONTROL

GHIEL guarantees high quality of its Solar Home Systems with competitive warranties for all components. Maintenance for the GHIEL Solar Home System is provided free of charge by trained local GHIEL technicians for 3-5 years depending on the component. Solar panels have a life span of 20 years and are very durable and easily maintained. GHIEL offer a warranty for the solar panels for 20 years.

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

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SOLAR PANELS

Solar panels consist of arrays of photovoltaic (solar) cells that capture the solar energy and produce electricity. The GHIEL Solar Panels are made of mono crystalline panels. These panels are more expensive to produce than the alternative polycrystalline panels, however, they are of higher quality and more cost-efficient in the long run. To increase the power capacity of the solar panels an array is constructed by wiring several panels together. The voltage at which the electricity is available, fluctuates during the day as the sunlight varies.

Solar panels are durable and withstand erosion caused by different weathers for many years. GHIEL offer a warranty for the solar panels for 20 years. The output power of most panels slowly degrades at about 0.5% per year.



BATTERIES

Batteries are an important component of the GHIEL Solar Home System as it allows for storage of the generated power and use of electricity after daylight hours. The batteries provided by GHIEL support the power capacity of the solar panel. For larger power supply several batteries are wired together. These batteries should be stored in a dry, cool and well-ventilated place — preferably on a rack elevated from direct ground contact.



SOLAR CHARGE CONTROLLER

A charge controller is placed between the solar panels and the batteries to stabilize the fluctuating voltage of the panels and convert it into a suitable form for recharging the batteries. Charge controllers protect the batteries by preventing them from overcharging and they also protect the panels by preventing back-flow from the batteries.



INVERTER

The inverter converts the 12-volt DC power from the batteries into 110-volt AC house current. The inverter is installed as part of a solar control center. If the power generated exceeds the household need for electricity, the inverter can be connected to a power grid and programmed to sell some of the generated electricity to a third party.

SOLAR WATER PUMP

A solar water pump can easily be integrated in the GHIEL Solar Home System. The GHIEL Solar Water Pump uses solar energy to supply a household with purified drinking water. The water quality is tested by GHIEL 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).



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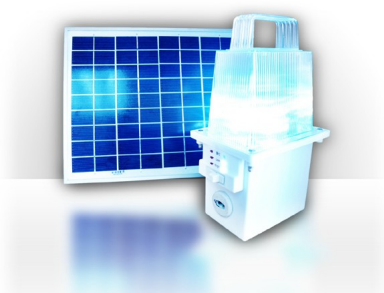


SOLAR LANTERN

The GHIEL solar lantern is a LED based solar lantern system. The lantern is charged through a rechargeable battery connected to the power generating PV module. The lantern itself is portable and designed for both indoor and outdoor use. The GHIEL solar lantern system includes a phone charger and has a duty cycle of minimum 5 hours per day.

BENEFITS OF THE GHIEL SOLAR LANTERN

Solar lanterns are a clean, cheap and reliable alternative to traditional lanterns (fuelled by e.g. kerosene or gas), candles and torch lights.



The GHIEL Solar Lantern has the following benefits:

- Extremely low environmental impact with no carbon emissions
- Safe for both the user and the environment
- No fire or other environmental hazard
- Guaranteed daily supply of energy
- In the long run the solar lantern is the cheapest source of electricity for lighting.
- People in rural Bangladesh spend an average of 12-15 BDT per day on kerosene while the GHIEL solar lantern has a total cost of 2500 BDT. Considering a service charge of 12% on the repayment plan offered in conjunction with the product, the client is able to pay for the lantern in full in 200 days solely by the savings on daily fuel expenses

GHIEL Solar Lantern System	<ul style="list-style-type: none">• 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