



BGEF

Bright Green Energy Foundation

With a vision to make Bangladesh the First Solar Nation



BGEF

Bright Green Energy Foundation

With the vision of **Mr. Dipal C. Barua**, Founder and Chairman, BGEF was founded in **January 2010** to face the energy crisis of Bangladesh with clean, environment friendly and efficient renewable energy source. BGEF has created opportunity for thousands of new jobs for both men and women of Bangladesh

Founder of BGEF
Dipal C. Barua
BGEF



First Zayed Future Energy Prize Winner 2009

Advisor (PSAG), Green Climate Fund
Ambassador, Zayed Future Energy Prize (ZFEP), Abu Dhabi
Ambassador, Global 100% RE
Councilor, World Future Council

President
Bangladesh Solar & Renewable Energy Association (BSREA)
President, South Asia Network for Clean Energy (StANCE)

IPCC : Lead Author (Chapter 16)

Founding Managing Director, Grameen Shakti, Bangladesh

Former Deputy Managing Director (DMD) & Co-Founder
Grameen Bank, Bangladesh

BGEF Programs:

Solar Home System (SHS)

Bio Gas Plant

Improve Cook Stove

Green Technology Center (GTC)

Charging Station (Women)

Solar Irrigation Pump (SIP)



History of Solar Home System in Bangladesh

In 1996, I have successfully started renewable energy technology specially Solar PV program in rural Bangladesh as the Founding Managing Director of Grameen Shakti. First I realized that, if the cost of Solar Home System (SHS) can be made affordable through a **innovative financial model** to the rural people and if brought near the price of **Kerosene**, only then the benefit of SHS will be possible to take the technology to the off-grid energy starved rural people of Bangladesh.

1. A monthly installment-based payment method which reduced the cost of a solar home system close to the equivalent of monthly kerosene costs.
2. A strong effective after sales, repair and maintenance network, involving local technicians and especially women technicians / entrepreneurs who repair and assemble solar accessories in their communities.
3. It was shown that Solar PV technology can be successfully implemented on a mass scale to provide rural people with environment friendly energy, Clean lights, more income with extended working hours and hazard free healthy living.

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I have successfully demonstrated that renewable energy is a viable option for the rural people and the myth that this energy technology is too expensive and high-tech for the rural people has been broken. The challenges we initially faced were huge but, I derived and implemented effective integrated market-based strategy that considers the following :

- Costs should be within reach of the rural people. If the costs are perceived too high and the technology is not cost-effective compared to traditional energy alternatives, the rural people will not be interested.
- Efficient and effective after-sales service should be available so that clients are assured of prompt responses to their problems.
- Quality needs to be ensured to earn the good will and trust of the rural people.
- The technologies should be linked to income generation local market forces should be deployed through capacity through capacity development and local stake hold.

Integrated Sustainable entrepreneur based business model to bring clean and affordable energy, income, health, and economic development to rural Bangladesh

In response to the special needs of the rural people, I developed a **sustainable integrated model** that facilitates income generation instead of reliance on subsidies, creates local community support and capacity development allowing the people to solve their own problems instead of creating dependence on others.

This is a model which brings technology to the people by coupling innovative financing with technology transfer through effective community involvement. The key elements of the integrated sustainable entrepreneur based business model are:

- Providing no direct subsidies but innovative financing schemes based on installments that make the technology affordable and cost effective compared to traditional energy alternatives and it creates ownership.
- Creating awareness for renewable energy technologies through motivational programs and social activities that involve the community.

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- Gaining the trust and confidence of the rural people by focusing on consumer needs and providing high quality services including consumer friendly product design, installation, training, of clients on proper use of technology, free monthly after sales support, and strict quality control. Our consumer friendly approach also includes a buyback system allowing customers to return solar home systems at depreciated prices if there area is connected to the grid.
- Linking the technology to income generating activities and creating opportunities for entrepreneur development. I encourage micro-utility initiatives allowing the technology owner to generate an additional incomes, and encourage community based manufacturing by purchasing and assembling accessories locally.
- Focusing on women as the main actors and entrepreneurs of change and set up Green technology centers (GTC) and trained & empowered rural women who are working independently as renewable energy technicians and entrepreneurs.



GTC work

Solar Home System was introduced in Bangladesh back in 1996

Solar Home System (SHS) was introduced in rural Bangladesh back in 1996 by overcoming the followings:

1. Created awareness about the use of **Solar Energy** and saving **kerosene** among the rural people of Bangladesh.
2. Made the SHS affordable at the price of Kerosene through a **innovative financial model**.
3. Created rural base Green Technology Center (GTC) to take the after sales service at client's door step.
4. A new renewable energy sector was developed and thousands of employment opportunity was created.



Solar Home System

Innovative Financial Model

To promote renewable energy in rural areas on a commercial basis it was important to develop a successful financial mechanism. An innovative financing model has made it easier for its customers to afford the RE technology at the cost of kerosene.

At the Beginning

50% down payment to install the system and remaining **50%** in **6** monthly installments.

After few years of Experience

25% down payment to install the system and remaining **75%** in **24** monthly installments.

Present Situation

15% down payment to install the system and remaining **85%** in **12/24/36** monthly installments.

Initial challenges faced for Expansion of SHS :

- Lack of access to sufficient and sustainable supplies of energy
- Lack of infrastructure
- Limited or no Access to finance
- Lack of skilled Manpower
- Lack of proper financial model design to make SHS affordable
- Lack of Awareness about the clean and environment friendly energy sources which will eventually protect the climate for further damage.
- Lack of National energy policy
- Lack of private public partnership in energy sector

Installing 7.5 million Solar Home Systems (SHS) in rural areas of Bangladesh by the year 2020.



**Solar Home System (SHS) &
Women Involvement**

Solar Home System :

Until March 2016: Over 4 million Solar Home System (SHS) has been Installed in rural Off-Grid Areas of Bangladesh.

1. It's the fastest expansion of solar energy anywhere in the world.
2. More than 50,000 SHS's are being installed in off-grid areas of Bangladesh every month with almost 20 million rural beneficiary.
3. Rural businesses are booming with the support from Solar energy.
4. Supporting National Grid Power generation capacity.
5. Job opportunity created for both men & women.

With Solar Power Rural People Can use



Children can Study better by Solar Light



Can use mobile phone charger



Watching solar powered TV

IDCOL

Infrastructure development Company Limited

Infrastructure Development Company Limited (IDCOL) was established on 14 May 1997 by the Government of Bangladesh. The Company was licensed by the 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 financing gap for developing medium to 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 started the SHS program in 2003 to ensure access to clean electricity for the energy starved off-grid rural areas of Bangladesh.

In June 2011, Bright Green Energy Foundation (BGEF) has become IDCOL's Solar home System (SHS) partner organization (PO) after complying with IDCOL's requirements and quality. Before that BGEF was enlisted as SPO of IDCOL in **October 2010**.

Within last **4 years** BGEF has become **4th (forth) among 48 partner** organization in overall performance and standing in **3rd (third)** place for last 6 months in monthly sell category.

At present BGEF is installing over 2000 SHS per month in off-Grid rural areas of Bangladesh.

Overall Collection efficiency is over 95%.

Bright Green Energy Foundation

Inception	:	28 January, 2010
IDCOL SPO	:	Oct 2010
Became IDCOL's full Partner organization	:	June, 2011
District Covered	:	52 out of 64
Total Zone	:	11
Total Area Offices	:	54
Total Branch	:	307
Number of Employee	:	1393
Number of active Women Employee	:	14
Solar Home System (SHS) (installed)	:	140193
Solar Irrigation Pump (SIP) (installed)	:	16
Bio Gas Plant (Installed)	:	140
ICS (Improve Cook stove) Installed	:	3965
Beneficiary of SHS (People)	:	Over 1 Million

BGEF Activities

- Create Awareness in rural Bangladesh about Clean and efficient Energy source.
- SHS, Bio-Gas Plant, Solar Irrigation Pump and ICS installation
- Provide after Sell Service
- Customer Training for maximum output
- Staff Training
- Ensuring the quality of the installed products.
- Ensuring maximum numbers of beneficiary from installed renewable energy product.



Quality Control

- ▶ Ensuring Required Specification of every materials before purchasing.
- ▶ Ensuring Warranty Period
- ▶ Observing Sample Testing at the Field for any accessories before procumbent.
- ▶ Ensuring the warranty claim and replacements

Procurement Process

- Obtain Quotation from the Suppliers (minimum 3)
 - With detail Specifications
 - Sample of the quoted product
 - Ensuring Warranty Period as per IDCOL approval

After obtaining the Field test report a work order is issued and quality of the delivered product is strictly maintained.



Where we are in Solar PV

- **Over 4 million Solar Home System (SHS)**
- **Over 200 Solar Irrigation Pump (SIP)**
- **1 MW of solar hybrid solution**
- **20 MW Solar Rooftop Grid Tie installation**
- **200+ solar powered BTS**
- **200 MW of solar PV installation**
- **100,000 + Green jobs**
- **USD 10 million per year equivalent carbon credit**



New Initiative : Solar Irrigation Pump (SIP)



Installed pump in : July, 2015

Place : Village – Teghoria

Union : Poradoho

District : Kushtia

Pump Specification:

Pump: 13 Kwt

Solar Panel: 19.20 kwt

Facts for solar irrigation

- 36% of GDP and 64% of employment comes from agriculture
- 120 million acres of rice field is irrigated by 1.75 Million pumps
- 1600MW of electricity & 900,000 tons of diesel consumed
- Solar irrigation can save up to USD 100 million of government subsidy in diesel



*BGEF installed Solar Irrigation
Pump at Kustia District,
Bangladesh*

Solar Irrigation Pump

- Replacing traditional hazardous diesel pumps with innovative and environment friendly Solar powered pumps.
- Reduce carbon emission and air pollution caused by Diesel run traditional pumps.
- High efficient design and module (Pump, Motor, Controller box and Solar PV) used for optimum output.
- Farmers can get the benefit of irrigation water by only paying $\frac{2}{3}$ of the price they are currently pay now.



**Water Discharge by a Solar
Irrigation Pump installed in Kustia
by BGEF**

Potential of SIP in Bangladesh



The country has about **1.71 million irrigation pumps**, of which 83% run on diesel. The remaining 17% are electricity-operated. During the peak irrigation period 2500 MW of power demand is solely required for running the electric pumps.

The diesel-run irrigation pumps consume more than **half a million tons of diesel** each year.

There is a potential to install over 300,000 Solar Irrigation Pump in Bangladesh

Initial Challenges faced for SIP :

- ▶ Lack of awareness among the farmers:
 - ▶ Cost of water from Solar Irrigation Pumps
 - ▶ Environmental damage caused by Diesel Run pumps
 - ▶ Year round Efficiency about Solar Irrigation Pumps
- ▶ To identify the proper SIP site which would benefit both Sponsors and Farmers.
- ▶ Lack of skilled labor and pump operator.
- ▶ Lack of awareness about the benefit of SIP in local administration in rural level.
- ▶ Lack of online **Banking facilities (Mobile Banking)** in rural areas of the country to collect online payments directly from SIP beneficiaries.

To make SIP sustainable in Bangladesh:

- ▶ To show the financial benefits to farmers (savings)
- ▶ To provide the Information required for SIP to Local Administration for support and co-operation.
- ▶ Environmental Benefits
- ▶ Technical skill development and create awareness among farmers for Crop Patterns
- ▶ Provide agricultural support for better cultivation and more productions
- ▶ Ensure better income generation for farmers
- ▶ Arranging regular meeting and workshop with farmers





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My Experience with SIP

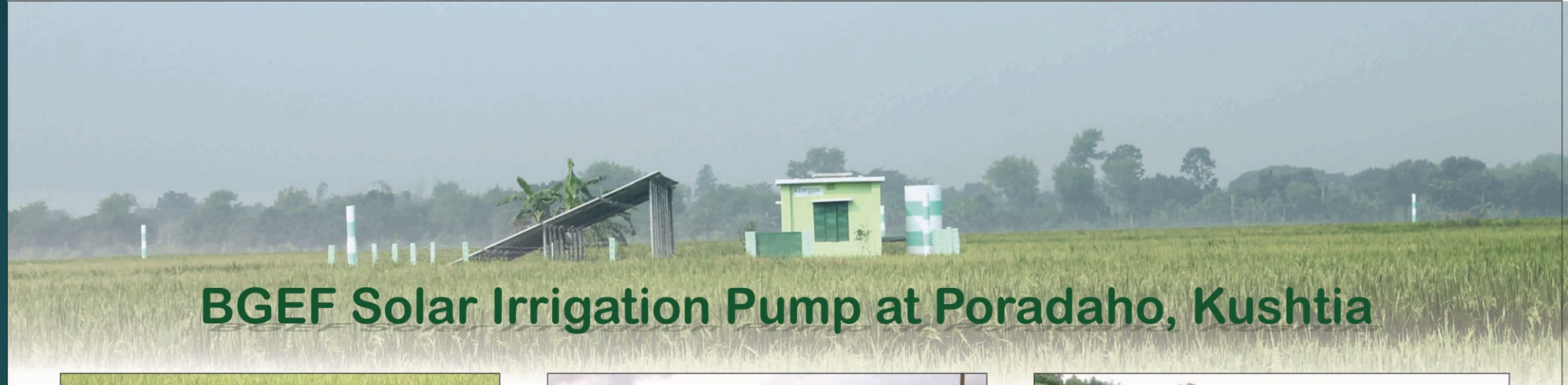
BGEF has started SIP installation

July 2015

9 SIP Successfully Installed

14 SIP are under construction

9 SIP new irrigation sites are selected for March 2016



BGEF Solar Irrigation Pump at Poradaho, Kushtia



Installing of SIP



Pipe boring process



Inspecting water reservoir tank



Interacting with farmers



Solar PV installed for irrigation pump

Solar Irrigation Pump:

Bangladesh as visited by Mr. Dipal Chandra Barua in October 2015



Meeting with farmers



Solar PV for Irrigation pump



Pump room

Mr. Dipal C. Barua is encouraging farmers to move forward with SIP for AMON season



Pump Inspection



First-Ever Zayed Future Energy Prize 2009



HH Sheikh Mohammed bin Zayed, Crown Prince of Abu Dhabi and Deputy Supreme Commander of the UAE Armed Forces, presents the first Zayed Future Energy Prize to Dipal Chandra Barua, in honour of innovation and commitment in alternative energy, at the Abu Dhabi National Exhibition Centre, January 19, 2009.

Thank you for your kind
attention
&
Your valuable presentence at
BGEF Head Office