

Grameen Shakti

A successful Renewable Energy Program in Bangladesh

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Bangladesh is an Energy Starved Country

Only 40% of population is connected to the national power-grid

- 85 % of this power is generated from natural gas - supply expected to be insufficient by 2016
- Electricity Production is only about 145 kWh per capita

Thus, 96 million people have no access to the national power grid

- □ Most (87 %) live in rural areas
- Majority of rural people depend on inefficient, primitive sources of energy
 such as kerosene for light



Development Requires Energy. Renewable Energy can be a cost-effective and pollution-free suitable for stimulating development.

Grid Map of Bangladesh



Journey Towards Green Energy Revolution

- Grameen Shakti (GS) was established in 1996 by Professor Yunus, Founder of Grameen Bank.
- Our Mission is to empower the rural people with access to Green Energy and Income Opportunities
- GS now operates all over Bangladesh with about 1100 field offices and about 8500 staff
- We foresee a future where all rural households of Bangladesh will have access to environment friendly energy at an affordable cost.



Successful Market-Based Approach for Bringing Renewable Energy to the Rural Population

GS Achieved this by Blending Technology with Social and Market Forces

Coupled with :

- Focus on income generation
- Local Technology Transfer
- Community participation & awareness development
- Dedicated and Committed Staff
- Engineers are trained as Social Engineers with high commitment & posted to remote areas.
- Flexible Management
- A Listening Culture
- Strong Internal Audit System



Covers all over Bangladesh

GRAMEEN SHAKTI UPDATE

Total Office	1134
Branch Office	948
Regional Office	127
Divisional Office	13
Technology Center	46
District Covered	64
Upazila Covered	508
Village Covered	40,000
Island Covered	16



Creating Rapport with the Community is another Key to Success



Grameen Shakti does this through Demonstrations, Science fairs, School Exposure Programs, etc

Now, Grameen Shakti is one of the largest rural based Renewable Energy Companies in the Country

3 Main Programs

- 1. <u>Solar PV:</u> Over 454,000 Solar Home Systems installed at a present rate of 20,000 units per month
- 2. <u>Biogas:</u> Over 13,500 biogas plants constructed
- 3. <u>ICS:</u> Over 150,000 Improved Cooking Stoves built
- Bioslurry organic fertilizer and Tree Plantation programs initiated.
- More than 6,795 women technicians & entrepreneurs trained through Grameen Technology Centers (GTCs)



Solar PV Program New Era of Renewable energy technologies

- Bangladesh has plenty of sunshine; a huge potential for Solar Energy.
- Rural electrification with Solar PV system is becoming very popular
- This technology is suitable for remote inaccessible areas-where there is no access of conventional electricity.
- GS provides financial model for SHS ownership



Solar Installation in a rural house

Reaching the Rural People The Need For Innovation

Hurdles Overcome

- High up-front costs of Solar Technology
- Lack of consumer financing
- Very limited investments in this sector due to perceived risks and uncertainty
- Knowledge and awareness gap
- Lack of efficient, cost–effective after sales service
- Lack of policy support

Financial Models

Option	Down payment	Installments	Service Charge (Flat rate)
Option-1	15%	36 months	6%
Option-2	25%	24 months	4%
Option-3	100% cash payment with 4% discount		
SSHS	Min 15%	24- 36 months	6%
People can own a SHS at the same cost of Kerosene			

The Clients have been rewarded with an umbrella and become proud owners of a system by paying back all their installments



Installation of SHS (Cum)





Over 464,000 Solar Home Systems Illuminating Rural Homes & Businesses with around 4 million beneficiaries



Extending business hours and boosting electronic businesses, agriculture, fish farm, poultry farm, etc
Facilitating education and health care in rural areas
Access to lights, televisions and mobile phones
Empowering women through training and income generation

Rural House Under Solar Light in the Hilly Area



Bandarban Region, Kanapara (Dark) Village

Rural House Under Solar Light in the Hilly Area



Bandarban Region, Kanapara (Dark) Village

Rural Tea Stall Under Solar Light in the Hilly Area

Bandarban Region, Kanapara (Dark) Village

Developing a Better Future Generation

School children can study better under solar light. A scholarship program has also been commenced by GS

Facilitating Income generation for Women

Many women are setting up cottage industries, others are rearing poultry or starting mobile phone businesses

- Less exposure to harmful kerosene fumes
- Save time not cleaning kerosene lamps
- Increased mobility
- Extended working hours

Illuminating Lives Bringing Care & Health to the Rural people

GS has brought dependable power supply to off-grid health clinics

Bringing Affordable Quality After Sales Service to the doorsteps GS creates a market by providing services close to the customers

- Training of local technicians & entrepreneurs
- Local production of accessories through entrepreneurs
- Free repair & maintenance during repayment period.
- Once a month visit
- Post warranty : annual maintenance agreement at low cost

Woman Technician working at her home

Blending Market Forces with Adaptive technology

- Micro-utility Model Sharing a Solar Home System to reduce cost and increase income
- Polli Phone : Mobile Phone centers with Solar powered mobile phones and chargers
- Small Solar Home Systems : Popular among low income household and helping to replace kerosene and generate additional income

Micro-Utility Model has become very popular in Market places

Grameen Technology Centers Creating Green Jobs For Women

- Over 6,795 women trained in sustainable energy technologies
- Some trainees set up their own energy businesses
- 46 GTC now set up to carry out training & manufacturing in rural areas to strengthen GS services
- Training beyond Solar PV

Mrs. Ambia, woman technician working at her home

Grameen Technology Centers

More than 150000 users have gained knowledge of RET and learned to take care of their systems

Grameen Technology Centers Creating Green Jobs For Women

Mrs. Nilufa, woman technician working at her home

A Young Woman Technician Installing a Solar Home System

Grameen Technology Centers Creating a Better Future Generation through Awareness development

More than 10000 School Children from rural areas have learned about Renewable Energy Technologies

The Challenges Ahead

- Financial and legal framework needs upgrading
- Attracting investment of financial institutions
- □ Higher prices of Solar PV system (Price of Battery
 - & other accessories are increasing)
- Increasing power efficiency of Solar PV system & decreasing production cost of PV including accessories
- Creation of new & skilled manpower
- Creating Green Entrepreneurship Opportunities
- Improvement of back up service
- Reaching Ultra/very poor households

Research and Development

- Solar Thermal Heater
- Wind Turbine
- Solar Irrigation Pump
- Solar in Big Cities
- **BTS Grameen Phone**
- Computer Center
- Refrigerators in Remote Areas

Solar Powered Irrigation Pump

Solar System Installed by Grameen Shakti in Distict Council Complex, Chittagong

Solar System Installed by Grameen Shakti in District Council Complex, Narsingdi

Urban Solar Home System installed by Grameen Shakti in Nando's Restaurant in Gulshan

Grameen Shakti Telecommunication

New Initiative

- Compared to diesel, solar electricity offers a sustainable, cost-effective and environment-friendly electricity supply for Bangladesh's growing telecommunication industry.
- Grameen Shakti has installed 6.5 KW solar plants for 4 BTS of Grameen Phone
- Following success with Grameen Phone, Grameen Shakti has received more offers from other mobile phone companies to install solar panel for BTS

Computer Center running by Solar

Solar panels on roof tops give power to computers

Computer Center, creating job opportunities for rural youth

Offices using solar powered computers in off-grid areas

Solar powered Refrigerators in Remote areas

30 Solar Powered refrigerators have been installed in Vet Clinics in remote areas and islands

These refrigerators are helping to store vital medicine for livestock vaccinations

Scope for International Cooperation

- Pilot testing & adaptive research for "2nd generation" solar pv in Bangladesh
- International cooperation and research could be developed on low cost solar pv module
- Piloting of mini solar grid entrepreneur programs with the financial assistance from international donors
- □ Adaptation of GS model in other countries
- □ Technology Transfer & Training
- Development & Research on other renewable energy technologies

Road Map to 2012

Solar program

- Set up 1000 Branch Offices in the next 2 years to install one million SHSs by 2012
- Setting up 100 GTCs in the next 2 years

Biogas plants

- Install of 50,000 biogas plant within 2012.
- Scale up linkages between biogas technology, live stock, agriculture and income generation to create a sustainable program

Improved Cooking Stoves

 500,000 stoves by 2012 through local entrepreneurship

National and International Achievements

International Microfinance Awards 2008 from PlaNet Finance (Paris)	2009
Ashden Outstanding Achievement Award (UK)	2008
National Environment Award (Bangladesh)	2008
Energy Globe Award (Brussels)	2008
Right Livelihood Award (Sweden)	2007
Tech Museum Award (USA)	2007
European Solar Prize (Germany) to	2006
Ashden Award (UK)	2006
IDCOL Award (for scaling up SHS)	2005
Solar Prize (for outstanding performance)	2004
USAID Best Theme Award	2003
European Solar Prize (Germany)	2003
Energy Globe Award (Austria)	2002
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Grameen Shakti's Other Programs

Improved Cooking Stove

Over 4 million BIOGAS PLANTS can be constructed : *Gas, Light , Electricity & Organic Fertilizers*

- Livestock owners can get rid of the waste and produce clean gas for cooking comfortably with no need for biomass fuels
- Can supply gas to neighbors for additional income
- Produce organic fertilizer
- Generate electricity
- Burden of women is reduced and their heath protected

Grameen Shakti's Biogas Program

Sustainable waste management & cooking gas production

A program designed to respond to client needs :

- Flexible loans
- On the spot trouble shooting
- Adaptive research
- Mason & User training

Initially a pilot project in 2005, GS Biogas has quickly become a popular program

Constructed more than 13,500 biogas plants, around 300 large sized biogas plants

Promoted Organic Fertilizer business and linkage between Poultry/Livestock, Agriculture & biogas technology

Slurry Processing at a biogas plant

Grameen Shakti has successfully introduced fiber glass bio-digester in Bangladesh

DEMONSTRATION PLOTS GS is promoting the use of organic fertilizers among farmers.

IMPROVED COOKING STOVES Cost-effective technology facilitating a pollution-free and healthy rural environment

- 2000 ICS technicians and entrepreneurs have been created
- 45 manufacturing units set up for smooth supply of grates, chimneys etc.
- Households and businesses save 50% on fuel costs
- Women can cook in smoke free kitchens

A Technician making an ICS with mud

Cooking with ICS made of cement

- Has a longer lifespan
- More visually appealing
- Easier and Quicker Installation

- Cement Stove was created just three months ago
- Already Established 66
 Production Centers

Year wise ICS Growth and Planning of 2010

More & more rural women are switching to Improved Cooking Stoves

- Smoke free kitchens, no soot, saves women's lives
- Face, chest protected from stove heat
- Swifter and better cooking
- More free time
- Saves 50% firewood & cooking expenses

A woman technician making a stove

Housewife cooking with Improved stoves

Behind the Success

- 1. Designing the Programs based on the End-Usurers requirement
- 2. Involvement of the **women** for managing and maintenance of the System at the house holds level
- 3. Market driven financial support for disseminating the products
- 4. Ensuring good quality products
- 5. Ensuring **Best Quality** after sell service
- 6. Given the **ownership** to the end users
- 7. Ensuring Buy-back the System when it requires

Thank you for your Kind Attention

