IRENA Innovation Week

The Age of Renewable Power

Topic: Business models

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Plenary II: Systemic Innovation

Founder & Chairman
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First Zayed Future Energy Prize Winner 2009

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Ambassador, Global 100% RE
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IPCC : Lead Author (Chapter 16)

Founding Managing Director, Grameen Shakti, Bangladesh

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

Bangladesh Experience

- **Back in 1996**, I have introduced an **innovative monthly installment based financial business model** at the price of kerosene which has opened the door for a Business model for Solar Home System (SHS). By following the path of **financial business model,** over 4 million SHS has been installed all over Bangladesh. The business model is designed:

  - 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.

Installment based financial Business Model

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.

Bangladesh Energy Sector-at a Glance

Installed National Capacity: 12,229 MW (March 2016)

Access to Electricity: Over 60% (March 2016)

From Renewables:

Hydro	230 MW
Solar PV	200 MW
Wind Energy	2 MW
Bio Gas & Mass	3 MW

Where we are in Renewable Energy

Hydro Power : 230 MW

Wind Energy: 2 MW

Solar PV: 200 MW

Biogas & Biomass based Electricity: 3MW

RE Installed in Bangladesh

Solar PV		
Solar Home System	Over 4 Million	185 MW
Solar Irrigation Pump	314 Pumps	10 MW
Solar Micro & Mini Grids	18 Approx.	5 MW
Rooftop Urban PV		5 MW
Street Lighting and other		5 MW

Other Renewables:	
Bio Gas Plant Installed	Over 35,000
Biogas based power plants	5 Plants
Bio Mass & Bio Gas power Generation	6 MW
Wind Power	1.9 MW
Hydro Power	230 MW

In the pipeline :

- Another 3.5 million SHS under IDCOL financing
- Six (6) solar module PV manufacturing facility of 80MW
- Install 500+ Solar Mini-grid in different off-grid areas of Bangladesh
- 2500 Solar Irrigation System
- Around 20 MW of roof-top solar solution is planned in Govt. & private sector
- The renewable energy share will be increased to 10%, which will be 2000 MW by 2020 and 4000 MW by 2030
- The energy saving will be 10% by 2020 and 15% by 2030 of total energy consumption

Benefit of Renewable Energy (RE)

- RE is Reducing dependency on conventional Fossil Fuel use.
- Protecting the environmental from pollution by the hazardous Kerosene & Diesel fume.
- Usage of Bio gas and improved cook stove is protecting environment form cutting trees & forests for the use of conventional burning wood.
- Utilizing and generating electricity through Roof Top Solar PV panels installation in the urban areas from unused rooftops.
- Mini grid is reducing huge electricity distribution cost (grid connection).

Roof Top Solution

Factors of Rapid Expansion of RE in Bangladesh

- Monthly Installment Based **affordable payment** method.
- **Quality products & services** to earn trust and acceptance from the rural customers.
- A vast network of dedicated, trained, committed and efficient **work force** .
- Profound understanding of the **market demand**.
- **Adaptive research** to effectively respond to customer needs.
- Constant **monitoring and evaluation** of clean technology.
- Reliable **after-sales maintenance and support**.
- Regular **customer training program** to create awareness and basic maintenance of systems installed.
- **Energy Efficiency:** Conventional utilities to be converted to efficient technology.

Solar Home System (SHS)

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 **over 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.

SHS Beneficiaries

With Solar Power Rural People Can use

Children can Study better by Solar Light

Can use mobile phone charger

Watching solar powered TV

Initiatives need to be taken for Future

- Properly implement a **sustainable financial business model** to expand RE technology.
- Implement a **strong RE national policy** and feed in tariff.
- Proper **investment policy guideline** to the private and public sector investors.
- Ensure **Technological standardization** for best quality products.
- Ensure the technologies affordable to the rural people through a **innovative financial package.**
- Develop a **strong Research and Development** sector to find out the positive demand area to deploy the technology.
- **Diversification** of RE uses.
- **Gradually transforming** community users to 100%RE for better livelihood such as
  - Household water for Drinking, sanitation & other daily uses through Solar Run Pumps
  - House hold Cooking needs through installing Bio-Gas Plant
  - Electricity through Solar PV

Customer Training

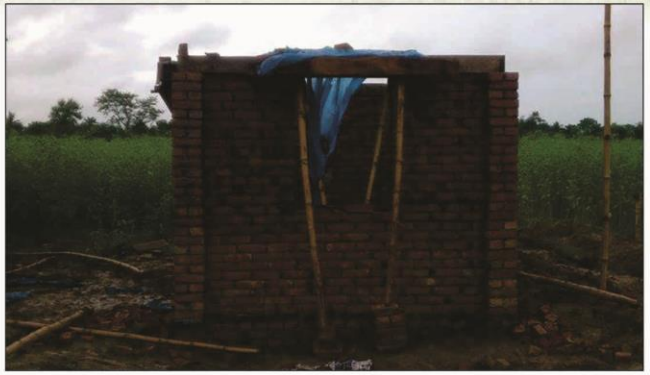
Recently visited customer training session (organized by BGEF) at Faridpur, Bangladesh with the visiting team from Tanzania, WFC, Brot

Local trained women technician Instructing customers Basic Maintenance of the system installed

Solar Irrigation Pump Capacity:

Motor	13.5 KW
PV Panel	20 KW or More
Water Discharge	1.75 Million Liters/Day
Cultivation Land	30 to 35 Acre
Replaces	6 or more Traditional Diesel Run Pumps
Economic Benefits	40% Less than diesel Run Pumps

BGEF Solar Irrigation Pump at Poradaho, Kushtia



Solar Irrigation Pump (SIP)

Water Discharge by a Solar Irrigation Pump installed by BGEF

- Replacing numerous (minimum 6) conventional hazardous diesel pumps with innovative, efficient 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 paying **2/3** of the cost diesel run pump by using Solar Pumps.

WFC & Tanzanian Team in Field Visit

Installing process

Pipe boring process

Interacting with farmers

Solar PV installed for irrigation pump

Inspecting water reserver tank

Solar & Renewable Energy has proven its potential success in rural Bangladesh.

Bangladesh has experienced an rapid expansion of decentralized Renewable Energy instead of conventional utilities and by installing over 4 million SHS in the rural off-grid areas of the country with over 24 million beneficiaries.

I believe proper implementation of RE policy, financial approach & sustainable business model may also provide a great Future to Renewable Energy in the developing world.

My dream is to make Bangladesh the First Solar Nation by 2021

First-Ever Zayed Future Energy Prize

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