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ASSESSMENT OF PV OPERATION IN BANGLADESH

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ABSTRACT: *National shortage of rural electrification and rural development is a fundamental improvement in solar home systems (SHS) in the form (PV) PV technology has been widely used to generate electricity in rural areas in this article foreseeable limitations and diesel Bangladesh. Photovoltaic (PV) market in explaining the distribution and abundance of renewable energy sources can be combined. Success has recognized the potential of solar energy. It is a supplier of high quality private companies to improve Limited communications (IDCOL), state agencies and nongovernmental organizations (NGOs) to bring together a number of basic energy in rural Bangladesh to bring the technology of solar PV to direct sunlight to function effectively. Rural electrification, including the lives of the rural poor in general will increase the earnings are presented in seven sections: Part 1 and Part 2, and Bangladesh is the purpose of resource potential and current conditions. The development of engineering design three market segments, the use of solar cells as IDCOL SHS, followed by an analysis of photovoltaic solar energy in Bangladesh Part 4: Case Studies and Projects stories receiver recognizes student achievement. The higher the quality of life in Palestine Section 5 and 6, and the value of investment properties of manufactured goods, including configuring and PV SHS July 8 shows. Performance is financial aid. It helps future financial plan will reduce the need to reduce the problem to demonstrate the conclusions drawn in section 9 installed. Solar energy at home with the principles of volatile paper increased from $ 200 million PV market experienced a case study of a class of Bangladesh in other parts of Asia began to take shape and photovoltaic market*

KEYWORDS: *Photovoltaic; Bangladesh; rural electrification; SHS; zeroing subsidy*

INTRODUCTION

Bangladesh to develop sustainable energy and food security with the risk of tragedy is the 160 million populations of the developing countries of South Asia, in fact, 70 % of housing in rural areas and rural areas in the country, only 30 % of the power grid resolution list is not closing. Network of solar home systems are in rural areas, the local network settings of rural solar hybrid system tables for the area. The market is for financial applications. Mounted on the press is the most important role. In cooperation Basic use of solar PV solar home systems in rural Bangladesh (SHS) and the performance of micro (electrification of rural markets) in response. Solar electricity customers are customers that have been set , which indicates that the overall system IDCOL business model providing public and private sector are ready for private development organizations , government ownership , and operation . Check the selected companies. Solar projects, it is a condition that is access to electricity in rural areas. Much of his career has brought positive changes to the U.S. Senate. Foreign Relations Committee was on November 19, 2009

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speech, John Kerry, chairman of the World Bank, the World Bank headquarters project literally. IDCOL SHS project is both life changing facilities IDCOL Bank. World Environment (GEF) KfW (German Development Bank), GIZ (German Technical Corporation with support. Financial Agenda solar energy , solar home systems in remote rural areas (SHS) promotion , distribution) , the Asian Development Bank, USAID and the main objective of Islamic Development Bank of this program is to IDCOL in January 2003 and the end . June 2008 there were 50,000 SHS financial objectives schedule three years and cost $ 2.0 million dollars in this project was obtained in September 2005 in 2012, 1 million IDCOL then revised its target of getting caught. Introduction During the last decade is the demand for space. Rural Electrification basic operators determined by public and private organizations that have been met through the development of demand for Solar Home System (SHS) in the medium-term program implementation and is expected to supply electricity to the power grid. In rural areas, bringing together the world's most difficult to be one winner.

OBJECTIVE

The purpose of this article IS e to see how the management. Different monitoring and institutional, technical, marketing and financial point of use solar power in rural areas is to identify best practice examples of how different education and business. Holistic development framework IS for rural electrification and / or friends to form a combination of methods that facilitate consistent policy appropriate and reasonable in accordance with the purpose of the current study. Such as: Participation in rural development through a wide range of award-winning legend and PV devices to operate. Affect the way Construction and operation of the market for PV in rural Bangladesh. In improving the investment tools available in a variety of praise. Learn about the inspiration and financial plan for the process. Praise and financial support to curb the market will decline.

Bangladesh

Location: Between latitudes 20 ° and 27 °, there is no Bangladesh is a country in South Asia, and longitudes 88 ° and 93 ° E and Bangladesh Climate construction of solar power is a very good quality to have. Benefits as tropical amount of radiation in December- January and March- April at least month can now are accessed at.

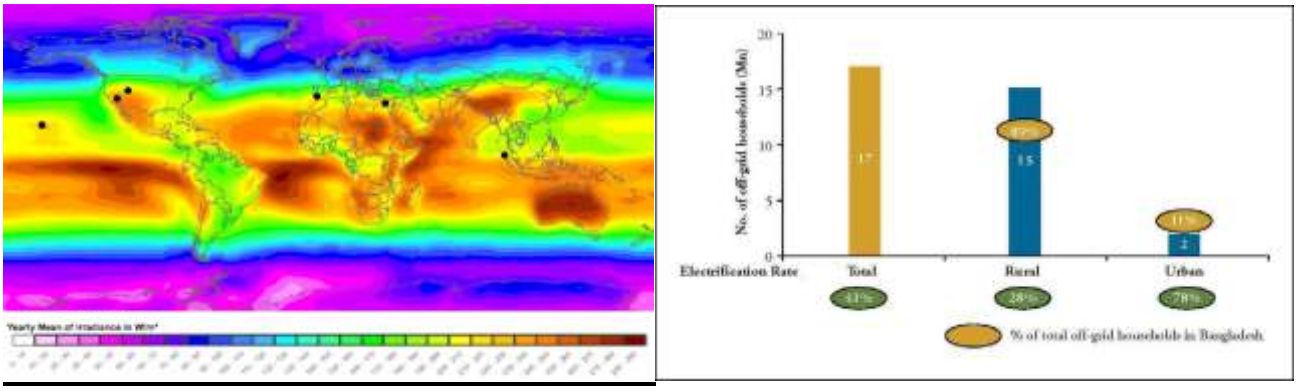

Fig1: Average solar radiation showing land area

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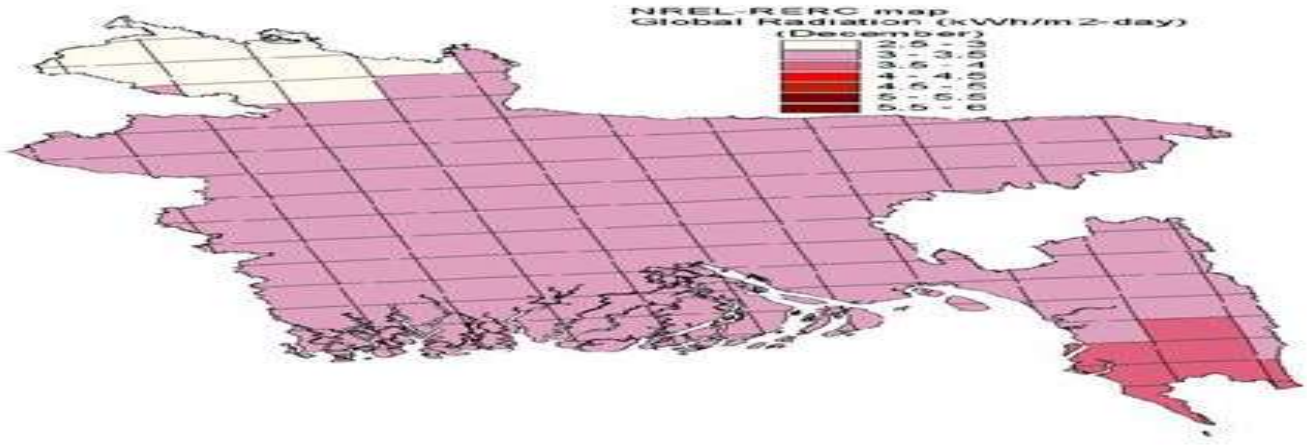

Fig2:solar Radiation Map of Bangladesh

Contemporary circumstances: Bangladesh 163000000 (or 29 million households) and 17 million households in power consumption, turn off the grid from 41% to burly important part of the life of the grid (89% or 15 million households) in rural Bangladesh. State will be set at 28% (Figure 2) the level of electricity consumption fell from the face of the most significant power outages every day in the table below - Electro is.

Fig 3.Rural-urban Distribution of Off-grid households in Bangladesh. Source: International Finance Corporation (IFC) on February, 2012

Distributed Solar Energy in Rural Committee (REB) was held for the first time in 1998, Local Government Engineering Department (LGED) and the Infrastructure Development Company Limited (IDCOL), in 2003 the market (Figure 3), only 20 MW. electricity from renewable energy in Bangladesh for three years from now SHSS alone compared with 70 MW of electricity makes up about 98% of the state total SHSS IDCOL has donated IDCOL SHS to go through the agenda. Current total number 1655832 in 2012, the year 2003 is 11.745.

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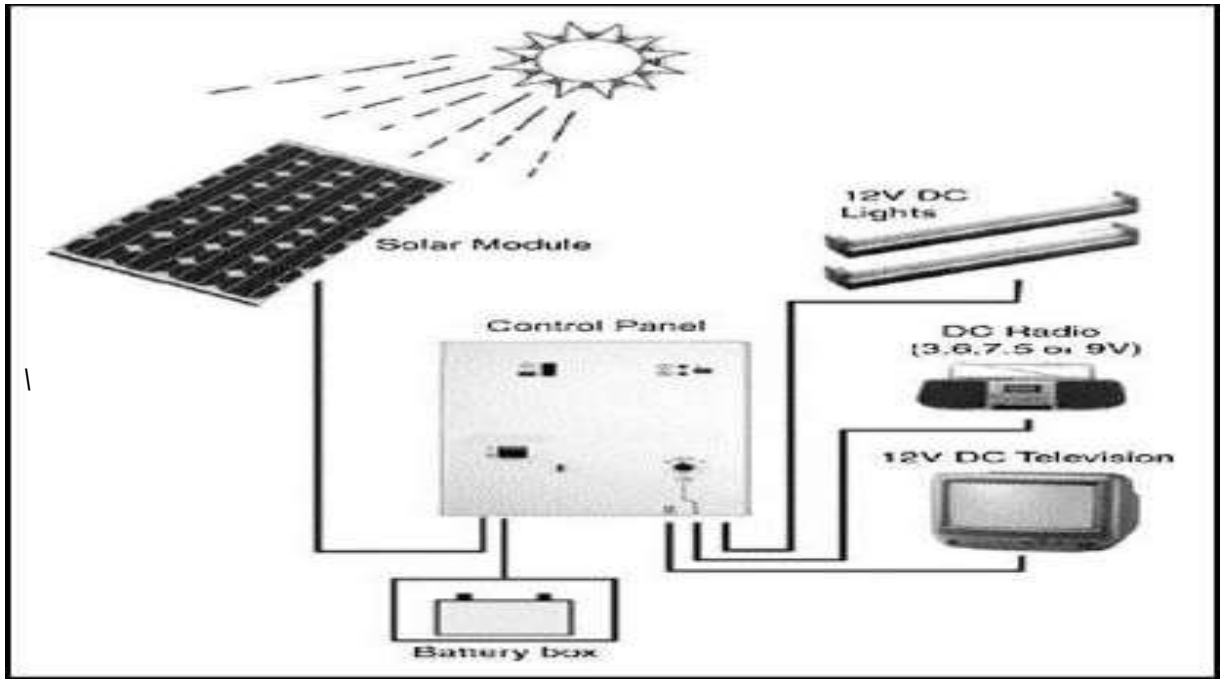
Analysis of solar PV program in Bangladesh

Technical design and sizing: Komatsu observes that household income and kerosene consumption to be the essential factors behind the selection of particular SHS size by households in Bangladesh. Most SHS disseminated in the region are in the capacity range of 37-75 W_p, the most common being 50 W_p systems. The solar PV program appears to have better success rate (in terms of system functionality) in Bangladesh, where quality standards have been ensured for PV panels, batteries and other components as approved by the technical standards committees

Common PV use in Bangladesh: The commonly used solar PV in rural areas is:

- ✓ Solar home systems (SHSs)
- ✓ Solar lanterns
- ✓ Street lighting systems
- ✓ Solar PV water pumping system
  Solar mini grids etc.

- A typical SHS model: Solar panel, battery, charge controller, CFL (Compact Fluorescent Light) etc



IDCOL is comparable to the analysis of energy projects: Infrastructure Development Company Ltd (IDCOL) and infrastructure to promote private sector funding has been approved for the establishment of state-owned economy. Necessary to achieve SHS in rural Bangladesh, as well as basic power guarantees access to electricity by 2021 is to increase the government's vision. Preparation of solar home systems in 2003 ,1.655.832 (SHS) has been established in all grades in August 2012 of 200 MW power generation by 2015 is expected to IDCOL off the grid in rural areas of the country with the goal SHS 4 million in monetary.

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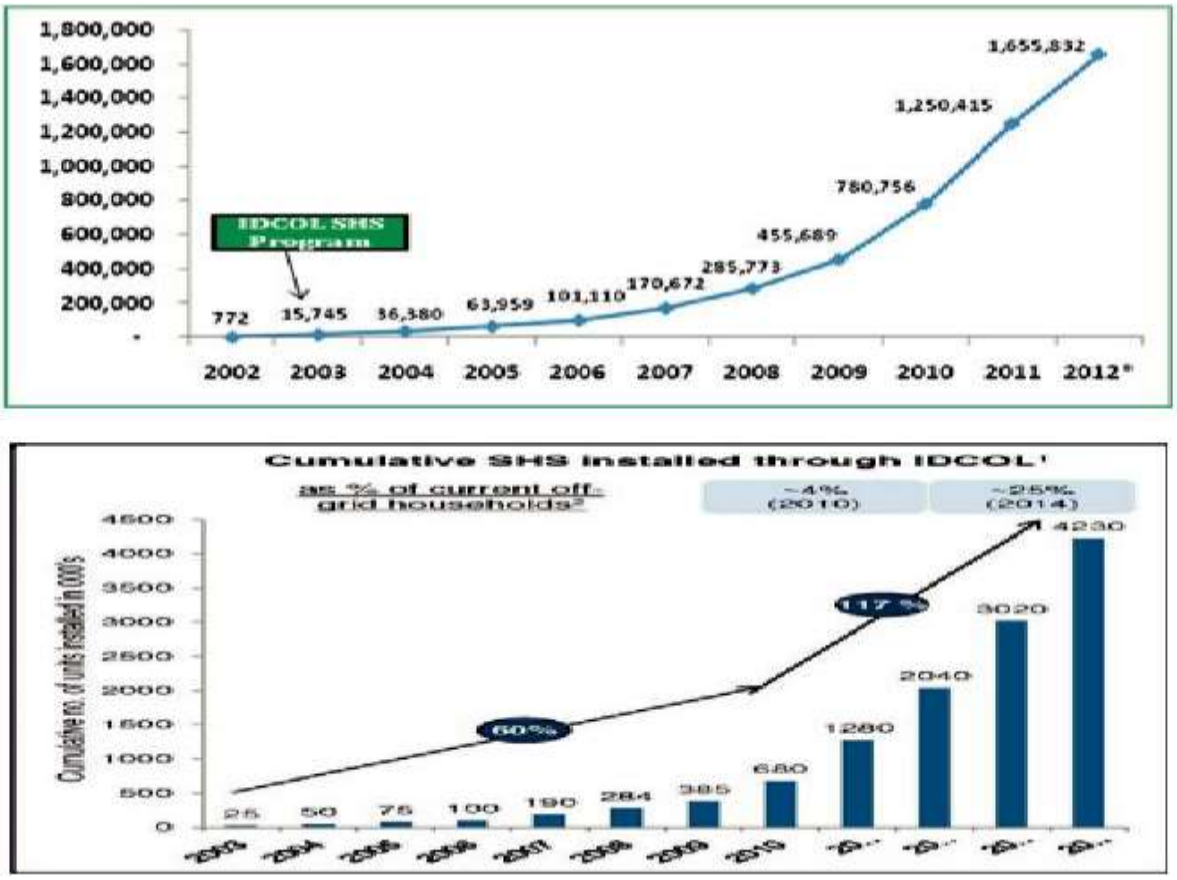

Fig 4: (Top) SHS installations from 2003 to 2012, IDCOL; (Bottom) Cumulative number of targeted SHS installations till 2014 [4].

IDCOL performance: Organizations Partner Number (POS) goes up 5-30 from 2002-2012 All Grameen Shakti (GS) SHS accounted for 64% of one of the most prominent.

Significant facial appearance of IDCOL SHS

Commencement: January 2003
Unit price range: BDT 18,000-65,000
Average price: BDT 28,771
Construction Time: 2 hours
Grant/unit: BDT 3,500
Refinancing/unit: Up to EUR 176
Retention/unit: No retention
Loan Tenor: 10 years
Grace period: 2 years
Payment Frequency: Semi-annually
IDCOL Fee/unit: EUR 9.85
Interest/service charge: 12% 15%

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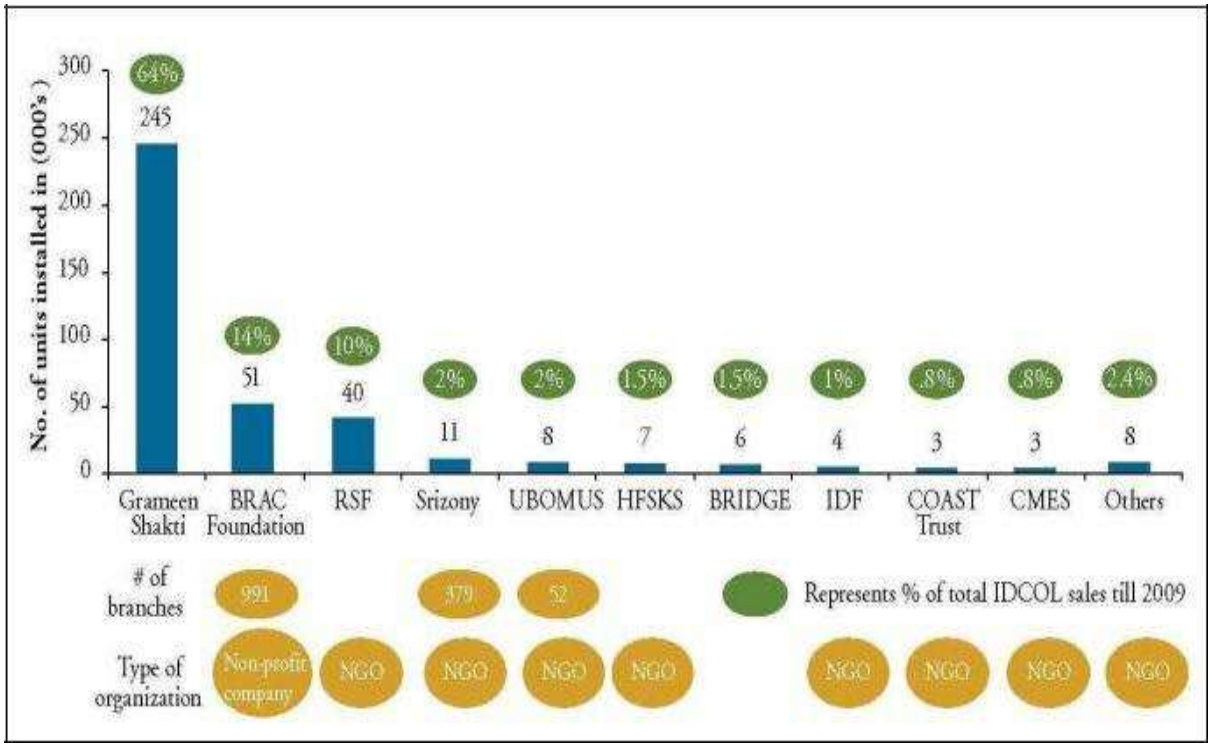

Fig5 . Cumulative Sales of Selective POs of IDCOL
Source: Overview of the policies - Bangladesh (RENDEV), IDCOL SHS model,financial model design- Bangladesh (RENDEV), Intellecap analysis.

SHS Family Academy Program (POS) affects the ability of the economy and loans from development partners on different treatments through IDCOL illustration of 50 Wp system capital structure (Figure 8) is shown here.

Cash donations are now down only credit sales: Now grants and financing back down.

SHS cost	USD 380	**Financing terms of loans from PO to household**	
System buy-down Grant A:EU 30	USD 38.40	Loan (BDT)	USD 290.36
Remaining Cost	USD 341.6	Loan duration	3 years
Household Down payment (15%)	USD 51.24	Total Interest charge (12% p.a. flat)	USD 104.53
Credit to customer (BDT)	USD 290.36	Total household payment	USD 394.89
IDCOL refinance (80%)	USD 232.29	**Monthly household Instalments**	**USD 10.97**
PO Contribution (20% of loan amount)	USD 58.07		

Fig.6. Financing Structure of a 50 W_p SHS System (*Source: IDCOL).*

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Victory legend of Bangladesh: Panchua village of Bangladesh Centre for Advanced Studies (frost) professional researcher Panchua g Kapasia Upazila, Gazipur district to conduct in-depth interviews with entrepreneurs, 100 were randomly selected using a survey of sixty families. SHS author interviews; If the remaining 40 households, 1,042 families and 1,267 villages spread across 4,959 acres Panchua (BBS 2006) population average household size was 4.76 and 4.9, respectively, and a literacy rate of 54% 37.24%, lower than the national average in rural small. Measure SHS 2003-2008 village interviews Panchua of family-owned businesses. Rural Electrification and Renewable Energy Development (RERED) sold with similar projects. Details of this study Panchua 320,000 SHS measured in grams and household SHS national average in Bangladesh to explore the similarities that make the analysis shows a good start.

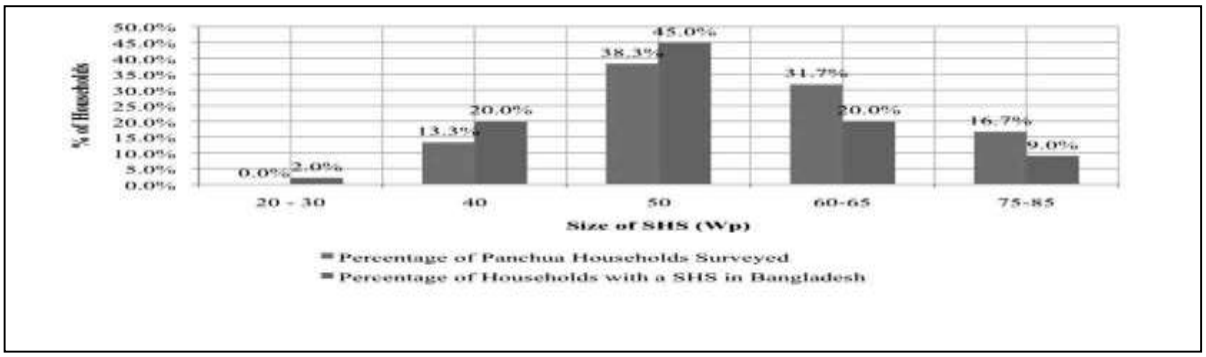

Fig.7. Comparative breakdown of SHS size in Panchua Village and across Bangladesh.
SHS product

Mujib, a 32 year old shopkeeper, has seen his income increased by 1,000 Tk/month andhisevening business grows since his system was installed two years ago. Customers enjoy the TV and the music from the CD player powered by the SHS. Previously, he used candles and kerosene for lighting. The price of kerosene kept rising, he suffered from bouts of bronchitis because of the fumes, and suppliers would sometimes adulterate the kerosene with petrol. The SHS eliminated those problems for him.

Mustafa, who owns a barber shop, used to borrow power from his neighbou r' s si de co nn ec ti on . He paid 200Tk/month but had no control over how much power he would receive, for how long, or when. The SHS, installed 13 months ago, has changed his quality of life and his business for the better. His hours are flexible, and he can close the shop as late as 9 pm.

Features and prices

SHS is shown in Figure 12 floor plans to sell about 80-85% 50 Wp in Bangladesh, accounting for 35% of all sales will be approximately 20-85 Wp, is within reach.

Capacity	**Total Load**	**Operating Hour**	**Cost (USD)**
$20W_p$	Lamp: 2 (5W each) Mobile Charger: 1	4-5 hours	140
$50W_p$	Lamp: 4 (7W	4-5	380

Fig. 8. SHS package in market

Cost profit ratio

Explore the use of kerosene lamps Pirojpur50 W - peak of Rs 20,000 for the cost of installing solar energy systems, which in 20 years, the RS 150, RS. 36,000 per month, Rs 1,800 is spent per year

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	each) Black & White TV: 1 Mobile Charger: 1	hours	
$85W_p$	Lamp: 9 (7W each) Black & White TV: 1 Mobile Charger: 1	4-5 hours	580
$130W_p$	Lamp: 11 (7W each) Black & White TV: 1 Mobile Charger: 1	4-5 hours	940

to meet the needs of the system introduced. Cost savings and lights at night to prevent the emission of smoke, it is impossible to run user acceptance behavior economical Kerosene lamp (Ref: IDCOL).

Subsidy Issue

Subsidy costs through economies of scale. Volume growth to turn down the volume on the principle that the market needed to assemble the neck injury, IDCOL is the main research areas of 1 million U.S. dollars in monthly payments will increase, as well as a specific orientation step completely out of the subsidy and the cost will be involved in the development of recommendations for funding. Private investment in new markets, businesses can weaken the private sector and the market conditions of the pot that can be applied in IDCOL in U.S. dollars per unit of 25 SHS subsidy has been reduced from U.S. $. 90, and is suitable for a short time (Figure 13) IDCOL plans to take the total market value of 144 million U.S. dollars per year in total market value, including the installation of SHS. Other manufacturers expressed interest to users, about 200 million dollars per year.

Fig.9. Subsidies provided and the cumulative growth of SHS installed.Source: Primary research, IDCOL, Intellecap analysis

PV market in Bangladesh

PV market in the future will be to buy under the state and capital will be placed on the market with no ongoing SHS program will consist of. Commercial use of this model IDCOL SHS is experiencing domestic victory. Goal is to reduce the energy crisis on private companies to provide trade credit with a partner manufacturer / supplier and technical in urban areas by integrating both the table and the design of the SHS and commercial development.

Solar energy potentials of Bangladesh

Bangladesh lies between 20.308 ° and 26.388 ° North latitude and 88.048 ° and 92.448 ° east longitude with an area of 147,500 km 2, which is an ideal location for solar energy to estimate the potential of solar energy. In Bangladesh performed using. GIS -based spatial Kit (GST) and

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NASA's Surface (SSE) of data, solar radiation, solar radiation due to limited information Meteorology and Solar Energy. In Bangladesh NASA SSE data set for Period July 1983 June 1993 were used and compared with measured data. Renewable Energy Research Center (RERC) , University of Dhaka for six different stations in Bangladesh , different data from 0.66 % to 4.52 % , up from NASA SSE set in the same place Solar Geospatial mapping tool . Bangladesh and it shows. Radiation from the sun is in the range of 4-5 kWh/m^2/day approximately 94 % of the surface area of Bangladesh and hours of sunshine per day on average of 6.5 and an average solar radiation is 0.2 kW/m^2 annual events. theory suggests that Bangladesh has received around 69 751 TWh of solar energy each year more than 3000 times higher than the current (2006) electricity in the average energy density of solar radiation is usually in the range of 100 annual - . 300 W/m^2, so the efficiency of solar cells 10 % of the area of 3-10 km^2 required. Making electricity produced an average of 100 MW, about 10 % of coal plants or nuclear power is great. The study showed that 6.8 % (10,000 km^2) of total area of Bangladesh. It is essential for the production of photovoltaic solar energy to meet the electricity demand of 3000 kWh / capita / year, another study found that the roof, including approximately 4670 km ^{2}. , Which is 3.2 % of the total area of the country? In urban areas (Dhaka) 7.86% of the total area . Is it appropriate for the production of Solar PV. Consider the availability of the table with only 1.7 % of the land in Bangladesh is assumed to be technically suitable for. Generate electricity from solar energy capacity of grid-connected solar PV obtained using solar radiation annual average (200 W/m^2) and 10 % of the solar system. Solar energy, therefore, the technical potential of solar grid-connected PV in Bangladesh is calculated as about 50 174 MW.

Commercial perspective of solar PV in Bangladesh

Of the approximately 25 million households in the country, only about 5.5 million have been raised under the general power to date .Because of the network in rural areas is relatively low consumer density, often becomes difficult and ineffective in expanding access to some remote place in the Palli Bidyut Samity sequence (government organizations in the management of the transmission and distribution of electricity for . settlements in rural areas) , and outlying areas . Some might Network Grid Does not protected by consumer inaccessibility and low-density renewable energy technologies are viable options for remote areas such techniques in particular. To ensure that construction is the equality of all the different parts and across socio-economic groups.

There is no doubt that renewable energy technologies will play an important role in the future development of the country in particular. In the capital costs of these technologies to become more competitive with grid electricity is expected to take place around the world in the next decade with the historical pattern of reducing the cost of capital for technology. Photovoltaic solar energy around the world , but until such time as a developing country like Bangladesh should take the effort to build credibility . Technical and social acceptance of such technologies through demonstration and pilot projects, it is prominent in other developing countries of the project. Currently is supported through grants from the federal government involved.

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Potential uses of solar PV in Bangladesh

Solar home system (SHS)

.This system consists of 20-100 watts peak (Wp) PV array, battery and charge controller. The size is the array and the sunset and the amount of electricity used in everyday life. With sunshine regime system has proved to be competitive with the operator to remotely SHS applied in many developing countries. In Bangladesh by the end of 2010, including about 645 033 SHSS has been installed.

Hybrid system

A recent study by Mondal and Denich and shows the location was chosen very pleased with radiation annual average global solar (3.81 to 6.47 kWh/m^2/day) are candidates expected to use the results - diesel - battery PV hybrid power systems. The location chosen for the simulations they showed that the most economical in rural areas, 50 households from the table, which consists of 6 kW PV array with a diesel generator, 10 kW and 10 numbers of batteries, each of which has a voltage and a storage capacity of 800 Ah and solar PV penetration is 43 % because of the high cost of diesel electric just not economically feasible. This study also shows that debt lies deep in Bangladesh is expected to candidates offered the use of hybrid power generation - battery PV - diesel due to radiation every day as well. Average sunlight, which varies between 3.8 and 6.5 kWh/m2 and diesel prices are almost the same across the country to use this system to generate electricity than diesel generators. Only reduce operating hours of diesel generators and thus will reduce diesel consumption and will lead to the reduction of greenhouse gas emissions.

Grid connected PV

Various types of interactive systems table being tested in grid PV arrays are widely available and are connected directly to the electricity grid using the appropriate subsystem DC power converter for alternating current (AC) power directly. to the power grid , so that the increase in stored energy is required tables themselves as the storage medium for such interactive grid that provides power to the table , as long as sufficient sunlight is available , the system will typically include direct structural elements of the building (. rooftop facade) , so system has the following advantages .

- Reduces both energy and capacity losses in utility distribution network as a generator placed at or near the location of the electrical load.
- It avoids or delays in upgrading the transmission network. And distribution (T & D) outputs the average daily PV system meets the highest demands Utility (peak demand during the summer as a result of cooling load).
- It is cost competitive due to saving for building materials roof tile is not considered necessary when installing solar panels.

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Recent status of solar PV application in Bangladesh

Cumulative generation and future plan

Data obtained from the database of the Ministry of Power, Energy and Mineral Resources (MPEMR) associated with Bangladesh net generation of electricity. Solar PV will be maintained until the bottom.

- The current production of solar power: 15-20 MW.
- Developments Energy Board (PDB) Rural Electrification Board (REB) and infrastructure development company limited (IDCOL) to be distributed to the public SHS . Live in an area away from the table IDCOL SHS is distributed to 450,000 nationwide via different. NGO
- GDP has installed nearly 11 kilowatts of solar power in the Chittagong Hill Tracts (CHT) of nearly 230 W solar Dahagram Chitmahal Angorpot and office space and 115 W in WAPDA .
- Solar panels capacity of 21.2 kW has been installed in the office of the Prime Minister.
- Nearly 10 MW solar power plant will be installed by GDP in Sarishabari (2-4 MW) Rajshahi Regional Office Training (1 MW) , Rajabarihat , Godagari (2-4 MW) power plant Kaptai (4-5 . MW) following an independent power producer (IPP) model, preparation of tender documents is underway .
- Proposed development of early (PDPP) has been prepared to cover the four isolated islands under solar power and wind .
- REB in 20 irrigation systems , irrigation pumps will be powered by solar . This solar project

Recent energy initiatives by the government

To improve access to electricity among the people living in the off grid is isolated and remote areas accessed by solar home systems (SHS) and to achieve. The purpose of the government it has set a goal of developing renewable energy sources 5 % of the demand. The amount of energy in 2015 and 10 % in 2020, the Government has taken a number of initiatives for energy efficiency and reducing energy consumption.

- Steps taken to correct the building code relating to the issues involved . Energy efficiency and solar energy potential .
- To raise awareness among the children processes to incorporate energy efficiency and solar energy issues in the school curriculum / madrasa / college.
- Installation of solar panels in the government, semi- government and free enterprise within three years.
- Use CFL bulbs in all government ministries and powers.
- Traditional street lights replaced with LED lights and solar power later.
- Public awareness to conserve energy.
- Cancellation incandescent lamp and electrical heaters gradually.

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- Limited use of air temperature of 25 ° C.
- The business community in promoting the use of solar energy.
- Introduction to Rating System, Energy Star appliances through the Bangladesh Institute of Standards and Testing (BSTI) .
- Discouraging the use of neon signs in malls, markets / shopping in the evening.
- Closing markets and shopping centers in 08:00.
- The steps taken to bring the prepaid metering system across the country to reduce the loss of the system and reduce power consumption .

Financial incentives through REP

Alternative Energy Policy (REP) was completed and finalized by the Ministry of Power, Energy and Mineral Resources (MPEMR) 2008. , REP In 2008, the Bangladeshi government decided to establish an independent , sustainable energy Authority (SEDA.) instead of alternative energy development authority (REDA) to accelerate the use of renewable energy . In electric Seda joined MPEMR will be responsible for determining priorities . In the use of renewable energy technology (RET) for the development and deployment of SEDA will support capacity building , technology development and market development are sufficient to increase the share of electricity from rets REP in 2008 , the government has proposed . financial incentives to invest in the following : .

- Facilities available o financing of renewable energy will be expanded to provide them with the ability to access public, private donations trade carbon emissions and provide funds for investment in renewable energy.

- To promote the use of renewable energy in the total energy of renewable energy equipment and materials involved in the manufacture of renewable energy equipment are exempt from VAT charged 15 % (VAT) .

- In addition, a small loan commercial loan support will be established.

- SEDA will consider providing subsidies for utilities to install. Solar, wind , biomass or other renewable energy or clean .

- Investors renewable energy projects will be exempt from corporate income tax for a period of 5 years ago .

- Tax incentives may be considered . For electricity generated from renewable energy sources That probably 10 % higher than the maximum purchase price of electricity to the utility of the private generators.

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- For the successful implementation of renewable energy projects. And initiatives to simplify loan procedures and strengthened.

Unmediated barriers for solar PV diffusion

There are many obstacles. Disruptive Widespread use of solar PV is kind of different barriers With past experience described below.

policy barriers

Lack of legislative framework, regulations and policies to market -oriented programs, solar PV, solar PV mostly in Bangladesh, especially technology - driven and focused on research and development, rather than focusing on the promotion and encouragement of commercial and private sector participation

Institutional barriers

Supply of renewable energy used to modern energy services is involved with various ministries, agencies and institutions for better coordination. Between them Required Efficient utilize human and financial resources are limited in this area. Long and difficult process allowed. Dependence on the federal budget for the implementation is activities that create uncertainty in the allocation of funds and project delays decisions relating to the time. Access to technology is limited spatial distribution of solar PV limited suppliers.

Technical barriers

Lack of standardization and quality is control for solar equipment. The lack of domestic production is difficulties in shipping operations. Utilitynetwork Procurement is a group of solar PV technology is limited due to the small moment. Solar PV by modern energy services, so that the (technical)infrastructure. To support the development of Solar PV is Domestic production and / or assembly of parts. Solar cells are very limited, despite the knowledge skills. Expertise and facilities available in the country .Limited technical capacity in management and treatment design Installation of Solar PV to modern energy services, primarily as a result of the lack of past activities in this new field.

Market barriers

Limited knowledge about the viability of solar PV market .Prepaid expenses at a high -level user. End - Photovoltaic solar energy is a major obstacle to increased use of resources. Solar energy for modern energy services .Market distorting subsidies or funds using mounting hardware.

Financing barriers

There is no financing, especially for activities. Photovoltaic solar energy is available to financial institutions in the capacity of financial institutions and public officials in evaluating solar PV offers and demand for loans is limited or not available. Government budget

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issubsidizing a limited demand for RE projects. National priority (health, education. Disaster re life etc.)is very large in financing. The size is now smaller and distributed solar PV market. Bangladesh does not include benefits such as economies of scale. The availability of solar resources is very specific needs detailed analysis. Specific local conditions are Economic and financial barriers to funding. High initial capital costs. Prejudice is experience with financial institutions and financing solar power projects .Lack of access to credit and financing mechanisms. Suitable for Solar Photovoltaic

Information barriers

Lack of information is about solar resources, technical information / economical, equipment suppliers and financial potential .Lack of awareness of the solar PV industry, public utilities and financial institutions. Policymakers The availability of and access to information , resources , solar power is not centralized , but distributed among various sectors such as public aid to development , R & D centers and educational institutions .Little empirical knowledge about . Costs and benefits of the various technologies that exist in the solar PV by modern energy services are available .Inhibit the development of human resources Co. , Ltd. specializes in business management and marketing skills .Restrictions on the ability of the state to collect solar energy analysis Lack of expertise and service system design , installation and operation . Maintenance of renewable energy technologies incountries limited capacity for the development of renewable energy projects.

Discussion: promotion of solar PV

The availability of new technologies or innovations is not justified. Adoption of the same, so it is important to understand the factors are that influence potential adopters during the various stages of the decision-making process.

PV related commercial processes. Closely with the basic elements of the theory of the adoption process, adoption of classical as well as the next step in the decision to buy or reject a new product (technology) . , Awareness, interest, evaluation, trial and adoption. / Rejection form existing technology adoption suggests that potential adopters of development interest in the product has been adapted and knowledge about it , this knowledge will help them in perspective and development . attitudes , persuading them to adopt or reject a product in the form of Roger his subtle innovation decision described knowledge as a set of " conditions " such as feelings of past practice problems / requests . Innovation and norms of a social system that serves as stateless persons knowledgeable Rogers also identified socioeconomic variables and personality measures of behavior, communication is the nature of the decision, all of this leads to the acquisition. Knowledge Characteristics or attributes of innovations that influence adoption included. The ability to compare is Compatibility complex trainability and noted advantages when compared to the rate at which innovation is felt by accepting to be better than previously thought , compatibility is the extent to which innovation is regarded as a consistent experience . the value and complexity of potential requirements is that innovation is regarded

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as difficult to understand and use the trainability is an innovation can be experimented with or used daily observations limited capability is the result . innovation is seeing someone else

Government can play a major role through policies and practices that demonstrate a commitment to raise awareness of the potential of solar cells in all walks of life, often times, people mostly market. Not recognize the existence and potential capabilities of the systems ' solar technology, the lack of information about benefits. Renewable energy and the economic cost of finance is a significant barrier to adoption, so it's important. Appropriate and targeted to certain key groups of potential users. Dissemination of information is a major factor in the distribution of the solar system; the government will build a financial system that favors tax breaks for PV infection. PV equipment purchases and facilitate in reducing the distorted energy prices, the government has to offer. Financial support and access to affordable credit plan to turn potential into actual users also allows duty free import of equipment and solar power. Equipment and components is that will help to reduce the initial cost of the solar system. It can also Play a key role in shaping cooperation in technology transfer. And provide institutional support for national and international research institutes, government can economic and Political Climate facilitate appropriate . Attract investment from overseas in manufacturing photovoltaic system , the government will ensure that the market is healthy by limiting monopoly to promote the development of standards and codes of practice , the government should encourage . Promotion of public awareness and environmental benefits and other industrial diesel . This can be done through advertising campaigns to reach out to others through PV programs , documents , newspapers , radio , television , billboards , highways and create demonstration sites , government intervention is needed in many ways to promote . The government should consider subsidies for solar PV technology to market stimulation PV .

There is no institutional framework and legal structure to create an atmosphere. Suitable for investment in solar energy is major constraints in Bangladesh are not necessary. To develop standards for all primary system components should also set standards for qualification or certification for the design and installation of PV system costs ranging from high and hence adoption . Solar cells will depend on the financial feasibility of investing in a PV system adjustments so that the financial plan and financial support. It is essential for the development of these technologies is the lack of funds for long -term obstacles.

Traditional accounting process does not take into account the cost, pollution and shortage of diesel, if these things are included in the calculation of the cost of the system which is widely used normal diesel decentralized (SPV) power technology . The sun solar power may be the ideal alternative to oil as the energy sector contributes to the power dissipation.

CONCLUSION

Solar project, IDCOL has been attached to each of the participating institutions to harness the power of collaborative efforts to complete a total capacity of nearly 12.5 percent of the SHS 163 million inhabitants of the country, which is fully 20 million homes, enough to provide 225 megawatts into the gap. Between demand and supply of electricity is the grid

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in an attempt to. Plan to build 500 megawatts of green energy. Several important developments in the market, reducing subsidies, and corporate governance structure, as in this case, the technical specifications, including the belief that the effectiveness of sanctions on the environment will be emphasized as we know. Bangladesh SHS installed already experienced. Volatility of growth and shape of the market at $ 200 million PV, so that the case could be replicated in other parts of Asia have begun to support PV.

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