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Abstract: Bangladesh will achieve considerable success in acceleration of economic growth of course need for sustainable renewable energy for development. At the present Government of Bangladesh takes the different financing models that have been developed and tested for renewable energy projects, especially *solar energy,* in urban and rural communities and energy efficiency improvement projects. Logistic regressions have been presented with the dependent variable as an indicator of the probability generates daily solar energy performance. In analysis, primary data and found that all the explanatory variables have a significant impact on the log of daily generates solar energy performance, whose *p-value* is statistically significant. When successful with these new approaches, the government should also be providing support for the thriving solar energy and energy efficiency technology projects for sustainable renewable energy development in Bangladesh.

Keywords: Renewable Energy, Energy Efficiency, Sustainable Development, Solar Energy

1. Introduction

Bangladesh is facing serious energy crisis with adverse impact on its growth potential and livelihood of people. The country is far behind to realize 8% annual growth in energy supply which is needed even to maintain the current level of annual Gross Domestic Product (GDP) growth rate of 6% (BBS, 2013). Because of the severity of the power crisis, the Government has been forced to enter into contractual agreements for high-cost and temporary solutions. To scale up the use of renewable energy and energy efficient (RE and EE) technologies and develop this commercially, the need for greater involvement of stakeholders and financial institutions has become essential for rapid growth of renewable energy and energy efficient technologies (Kotchen and Moore, 2007).

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Under the Companies Act, 1994, the Government of Bangladesh (GoB), is establishing an institution named "Sustainable Energy Development Authority" (SEDA). This will be a focal point for 'Sustainable Energy' development and promotion which are RE and EE. The longer term strategy embedded in the Sixth Five Year Plan (SFYP) of Bangladesh aims to promote low-cost, sustainable expansion of power generation, transmission, and distribution capacity. Government of Bangladesh as part of its energy policy is forging ahead in developing structures and policies which facilitate Private Public Partnership (PPP) in the development of RE and EE services across the country.

Energy efficiency and renewable energy are said to be the twin pillars of any sustainable energy policy. It has a national security benefit as it reduces energy imports (i.e. increase government reserves) and gradually diminishing the rate at which domestic energy resources are depleted. Energy savings will reduce Bangladesh's energy demand-supply gap and mitigate adverse effects on climate change. Efficient use of energy should be seen as a moral issue - to use available energy resources in consideration of future generations (Farhar, 1999; Nyborg, Howarth, and Brekke, 2006).). Since the energy system plays a vital role in interrelated economic, financial, social, and environmental aims of sustainable human development, energy efficiency improvements is crucial to climate change and sustainable energy development (Hordeski and Michael, 2003).

Therefore, the objective of the study is to: How could be empirically test the economic analysis of explanatory variables impact on daily generates solar energy performance by using multiple logistic regression model analysis techniques. And investigate gaps between policy makers, regulators', financial institutions and potential borrowers to consideration of future generations demand for sustainable renewable energy for development in Bangladesh?

This paper is organized into six sections- following introduction, and literature review in section-ii. Analysis of the renewable energy and energy efficiency technologies of Bangladesh in section-iii, and section-iv includes data and methodology framework for the analytical analysis and it also identifies and defines the variable considered. Section-v examines and the empirical results, and finally, summary finding and concluding remarks of the paper in section-vi.

2. Review of the Literature

The expanding of renewable energy across the world is not sufficient (Jefferson, 2006). Market barriers, economic and financial barriers, institutional barriers, and technical barriers prevent penetration of renewable energy into energy markets (Painuly, 2001). The effect of these barriers may vary across technologies and countries. Policies are considered to play important roles in development of renewable energy in various countries (Jacobsson & Lauber, 2006; Winkler, 2005; Tan *et al.*, 2008; Peidong *et al.*, 2009). Mitchell *et al.* (2004) argued that a feed-in tariff system is more effective to increase the share of renewable energy because it provides different kinds of risk reduction in terms of price, volume and balancing risk. The drivers of development of renewable energy such as Renewable Portfolio Standards (PRS), financial incentives, consumer demand for green power, and wholesale market rules are identified (Bird *et al.*, 2005).

Measuring the economic value of benefits from using renewable electricity could provide information of the location and slope of the demand curve for renewable energy. The concept of consumers' Willingness to Pay (WTP) is the cornerstone principle in measuring the benefits

(Brent, 2007). Although different methods are used, positive WTP values for renewable electricity are usually concluded. Economics rely on the concept of preferences and the utility maximization model. Bird *et al.* (2002) review international green power marketing activities by 2002 and the market penetration rates have been typically been in the order of 1%. A successful market example is Netherlands where 13% of residential customers had chosen green power.

Kobos *et al.* (2006) suggest that suggested that if without sustained federal research and development (R&D) and commercial marketplace, it may take a longer time to achieve cost reductions and further market adoption. Market deployment policies are found to have significant impact on per capita supply of renewable energy (Gan & Smith, 2011), and the effect of other policies (e.g. R&D and market-based policies) are not significant. The effectiveness of Renewable Portfolio Standard (RPS) is found to increase the total amount of renewable energy generation, but it is not a predictor of the share of renewable energy in the total energy mix Wiser and Pickle, 1997). Shrimali and Kniefel (2011) investigate the effectiveness of policies on the penetration of various emerging renewable electricity sources. Except a study that examines the effect of individual policy measures on technology innovation (Johnstone *et al.*, 2010), other studies examine effectiveness of R&D, feed-in tariffs, and quota obligations all at once. Popp *et al.* (2011) indicate that investment in renewable energy capacity across 26 OECD countries owns much too technological innovation, rather than individual policies.

Actual adopters of green electricity have been profiled by a few studies. A range of studies focused on the role of moral norms and beliefs about environmental conditions and personal responsibility which are based on the norm-activation theory (Schwartz, 1977; Schwartz & Howard, 1981). The number of environmental associations an individual participates in, economic factors (including WTP), knowledge, and environmental concern are correlated with adoption (Arkesteijn & Oerlemans, 2005). One may argue that people could make simultaneous decisions on membership and adoption in order to aid the understanding of motivations for households to switch to renewable electricity.

3. Renewable Energy and Energy Efficiency Technologies of Bangladesh

Renewable or 'green' energy is now at forefront of the country's priorities for environmentally sustainable economic progress. We urgently need much more energy for our households, manufacturing units and commercial establishments; and we need this energy produced in ways that minimize carbon emission and climate change effects. Although Bangladesh contributes very little to the renewable energy for power generation (more than 2 percent), the government has a vision of enhancing this to 10 percent by 2020 (BBS, 2013).

Being an agro based economy, the potential and scope for the development of renewable energy and energy efficiency is tremendous in Bangladesh. It has now become essential to rapidly expand the use of technology in diverse products. To scale up the use of RE and EE technology and develop this commercially, the need for greater involvement of financial institutions has become essential for rapid growth of RE and EE technologies. And identified the barriers to accessing financing for RE and EE technologies and gaps between policy makers, regulators', financial institutions and potential borrowers.

Once the above are ascertained then a strategy and an action plan would be prepared for removal of the identified financing barriers. At present Bangladesh takes the different economic and financial models that will be developed and tested for renewable energy projects in urban and rural communities and energy efficiency improvement projects. Although there have been few channel financing of NGO undertaking of RE and EE projects by banks, but this has had very little impact. The reason for this is the relative absence of a focused approach by banks and other financial institutions to provide commercial loans to RE and EE technologies based projects to the small, medium or large enterprises.

Considerable *green energy* for economic growth is important variable, the carbon trading under the Clean Development Mechanism (CDM) which provides a trading window for carbon credits, easing the typically higher cost burdens of renewable energy projects (Martinot and McDoom, 2000). The government is also providing support, including tax/duty waivers for the projects (Menanteau, Finon, and Lamy, 2003). Bangladesh Bank is promoting financing for solar energy, biomass and other renewable energy projects with refinance support lines for the lenders. The central purpose of these schemes is channeling funds through scheduled banks to specific sectors to accelerate economic activities in those sectors. Bangladesh Bank through its circulars issued at different times, has offered various refinance schemes, for accommodating special facilities to scheduled banks at concessional rates under the following terms and conditions, *shown in appendix-1.*

4. Methodology and Data

4.1 Data

To analysis primary data collected for used cross sectional study to be considered about allied factors for renewable energy, especially *solar energy*. Quantitative technique is used in the existence of the causes and effects of influencing factors- access to finance on solar energy and energy efficiency technology at the *individual, or micro*, level. The survey was conducted in urban area, Mohakhali and Niketan, ward no. 20, Zone-3 (Gulshan) at Dhaka North City Corporation (DNCC) in Bangladesh, on nos. of household 4,062, and 1.729 square kilometer area in Bangladesh. Given the sample size and distribution, it is clear that the survey is not intended to provide results representative of the whole household and business centre Mohakhali and Niketan area in Dhaka but to provide a quick diagnostic of solar energy and energy efficiency technologies determinants in Bangladesh.

The systematic sampling design that is used in the study is appropriately performed based on the geographical location and also determined the size of sample by using the appropriate formula. The most practical way of a 4% sample is desired, the first item would be selected randomly from the first twenty-five and thereafter every 25^{th} item would automatically be included in the sample. Thus, in systematic sampling only the first unit is selected randomly and remaining units of the sample are selected at fixed intervals. Moreover, it is an easier and less costly method of sampling and can be conveniently used even in the case of large populations (Kothari, 1990). The primary data were collected from the respondents during the period of time May, 2014. The survey was conducted over two hundred respondents from a particular area Mohakhali and Niketan at DNCC.

According to what is suggested by previous literature, economic policy factors are used as explanatory variables. This research is to prepare a strategy and action plan for removal of barriers to accessing economic and financial for solar energy and energy efficiency technologies, lack of familiarity of commercial banks and such institutions with these technologies, communication gap between financing institutions and potential borrowers of this sector namely, households and businessman. A structured questionnaire was prepared in the light of the objectives of the study that was filled up by direct interview.

4.2 Analytical Framework

4.2.1 Logistic Regression Model

The advanced econometrics models such as multinomial logistic regression model will be used and fit them to identify the inputs significant for sustainable renewable energy for development. The multivariate techniques viz., multiple logistic regression models, will be used to identify the determinants of daily generates solar energy performance in Bangladesh that is accelerating economic growth of a nation. The logistic regression model can be used not only to identify risk factors but also to predict the probability of success (Gujarati, 2004).

Let Y_i denote the dichotomous endogenous variable for the i^{th} observation.

Where Y_i = 1, if daily generate solar energy performance is maximum,
= 0, otherwise moderate or minimum

The linear probability model (LPM) was

$$P_i = E(Y=1 | Xi) = \beta_1 + \beta_2 X_i \quad (1)$$

Where, X_i is an exogenous variables and β_i 's the regression coefficients. The method is to model the response using the logistic function given by

$$P_i = E(Y = 1lXi) = \frac{1}{1+e^{-(\beta_1+\beta_2 X_i)}} \quad (2)$$

$$P_i = \frac{1}{1+e^{-z_i}} = \frac{e^{z_i}}{1+e^{z_i}} \quad (3)$$

Where $Z_i = \beta_1 + \beta_2 X_i$ and Equation (3) represents what is known as the, cumulative, logistic distribution function (Kramer, 1991). It is easy to verify that as Z_i ranges from $-\alpha$ to $+\alpha$, P_i ranges between 0 and 1 and that P_i is nonlinearly related to Z_i (i.e.,X_i), thus satisfying the two requirements. If P_i, the probability of daily generate solar energy performance is maximum, is given by (3) then (1-P_i), the probability of daily generate solar energy performance is minimum;

$$1 - P_i = \frac{1}{1+e^{z_i}} \quad (4)$$

Therefore, we can write

$$\frac{P_i}{1-P_i} = \frac{1+e^{z}}{1+e^{-z_i}} = e^{z} \quad (5)$$

Now $P_i / 1-P_i$ is simply the odd ratio in favor of daily generates solar energy performance – the ratio of the probability of daily maximum generate solar energy to the probability of daily minimum generate solar energy. If we take the natural log of (5), we obtain a very interesting result, namely,

$$L_i = In\left(\frac{P_i}{1-P_i}\right) = Z_i$$
$$= \beta_1 + \beta_2 X_i \qquad (6)$$

That is, L, the log of the odds ratio, is not only linear in X, but also linear in parameters. L is called the logit, and hence the name logit model.

$$L_i = In\left(\frac{P_i}{1-P_i}\right) = \beta_1 + \beta_2 X_i + u_i \qquad (7)$$

To estimate (7), the values of the regressand, or logit, L_i. If we have data on individual families, OLS estimation of (7) is infeasible. $P_i = 1$, if daily generate solar energy is maximum and $P_i = 0$, if daily generate solar energy is minimum. These values directly into logit, $L_{i,}$ we obtain:

$$L_i = In\left(\frac{1}{0}\right) \quad \text{if daily generate solar energy is maximum}$$

$$L_i = In\left(\frac{0}{1}\right) \quad \text{if daily generate solar energy is minimum}$$

Obviously, these expressions are meaningless. Therefore, if we have data at the *individual, or micro, level*, we cannot estimate (7) by the standard OLS routine. In this situation we may have to resort to the maximum likelihood (ML) method to estimate the parameters. Software packages *Eviews - 5.1* have built-in routines to estimate the logit model at the individual level.

4.2.2 Determinants of Solar Energy Performance

To estimate the model, a widely used multiple logistic regression frameworks are taken to separate out the effects of key inadequate access to finance on solar energy and energy efficiency technologies variables impact on daily generates solar energy performance. Using the survey data a logistic regression model has been estimated to examine how to determinants of daily generates solar energy performance based on explanatory variables, shown in below.

Dependent Variable:

Log of daily generate solar energy power	= 1, if daily generate solar energy power 520 watt (max), otherwise 130 - 170 watt or 10 watt (min)

Explanatory variables:

Year of uses of solar energy	‘1-2 years’, ‘3-5 years’, ‘5-10 years’, and ‘above’
Stakeholders of solar energy	‘household’, ‘business’, and ‘others’
No. of household members	‘<4 members’, ‘4-6 members’, ‘6-8 members’, and ‘above’
Provider of solar energy technology	‘government’, ‘NGO’, ‘IDA’ & ‘association’

Skills of solar energy dummy	= 1, if skill on solar energy, otherwise
Cost of solar energy technology	= 1, if high up-front costs of solar energy, otherwise
Amount of loan	‘nothing’, ‘< tk. 100,000’, ‘tk. 100,001 to 300,000’, & ‘> tk. 300,000’
Sources of borrowing	‘relative/ neighbour/ friends’, ‘mahajan’, ‘ngo’ & ‘banks’
Rate of interest annually	‘< 10%’, ‘10% to 15%’, 16% to 20%’ & ‘> 20%’
Collateral for loan	‘nothing’, ‘land and building’, ‘machinery and equipment’, and ‘personal assets of owner’
Operational risks on solar energy technology dummy	= 1, operational risks and regulatory certainty, otherwise
Market information on solar energy dummy	= 1, market information is still largely available, otherwise
Insurance on solar energy dummy	= 1, if have any insurance on solar energy, otherwise

The expected sign of explanatory variables coefficients are positive and or negative respectively. The error term is assumed to be random and serially independent having zero mean with finite variance. In order to determine the appropriate technique of estimation, the empirical model is estimated by logistic regression method. The direction and the strength of between the explanatory variables and log of daily generate solar energy power variability are determined from the sign of the coefficient and significance of *t-statistic*. To verify the validity of the model, two major evaluation criteria were used: (i) the a–priori expectation criteria which is based on the signs and magnitudes of the coefficients of the variables under investigation, (ii) Statistical criteria which is based on statistical theory, which in other words is referred to as the Least Square (LS) consisting of McFadden R-squared (R^2_{MCF}), LR statistic (df) and Probability (LR stat).

5. Analysis of the Empirical Results

5.1 Results of Logistic Regression

The empirical analysis is to explore the causes and effects of influencing factors on generate renewable energy and energy efficiency. Now let us interpret the regression results using the data. Since most modern statistical packages have routines to estimate logit models on the basis of ungrouped data. The regression results calculated by *E-views 5.1* are given in table-1.

Table-1: Results of Logistic Regression
Determinants of daily generate solar energy power
Method: ML - Binary Logit (total observations: 170)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	23.973	7.708	3.110	0.00

Amount of loan	0.849	0.264	3.212	0.00
Collateral for loan	-2.594	1.001	-2.578	0.01
Cost of solar energy technology	-3.185	1.027	-3.101	0.00
Insurance on solar energy technology	1.589	0.679	2.340	0.02
Market information on solar energy	1.211	0.447	2.709	0.00
No. of household members	-0.782	0.295	-2.651	0.01
Operational risks on solar energy	-1.565	0.471	-3.318	0.00
Provider of solar energy technology	1.301	0.268	4.854	0.00
Rate of interest annually	2.403	0.401	5.992	0.00
Skills of solar energy dummy	0.643	0.258	2.49	0.02
Sources of borrowing	0.818	0.245	3.029	0.00
Stakeholders of solar energy	0.575	0.211	2.725	0.01
Year of uses of solar energy	0.371	0.185	2.005	0.05
McFadden R-squared	0.668			
LR statistic (13 df)	93.575			
Probability(LR stat)	0.000			

Each slope coefficient in this equation is a *partial slope* coefficient and measures the change in the estimated logit for a unit change in the value of the given regressor, holding other regressors constant. The constant coefficient of 23.973 suggesting a relationship between the two variables show statistically highly significant with other variables constant but positive sign means if an individual has no amount of loan, sources of borrowing, collateral for loan, market information solar energy, provider of solar energy technology, skills of solar energy dummy and others. Among the sources of borrowing, collateral for loan, market information solar energy, and provider of solar energy technology have expected influences. To capture the effect of cost of solar energy technology (high =1) does have a significant impact because cost of solar energy technology is very high.

The coefficient of Stakeholders of solar energy is positive and highly significant. The positive coefficient reflects the relatively. Thus, the household stakeholder, with other variables held constant, that if household stakeholder increases by a unit, on average the estimated logit increases by about 0.575 units, suggesting a positive relationship between the two and statistically highly significant. Similarly, Year of uses of solar energy has a positive impact on daily generate solar energy power in our equation, if a year of uses of RE increases by a unit, on average the estimated logit increases by about 0.371units.

Solar energy and energy efficiency technology providers ('government', 'NGO', 'association' and 'IDA') and the coefficient of dummy form (yes=1) "Skills of solar energy" is positive and significant in the equation. As a consequence, solar energy technology drives up the returns to physical investment, ceteris paribus solar energy and energy efficiency technology flow, it will imply that the higher the share of solar energy performance devoted to investment and therefore the higher the growth rate associated with green energy. Moreover, cost of solar energy technology also appears as an important complement of solar energy growth process. The coefficient of amount of loan is statistically significant in the equations. Similarly the stakeholders may have sufficient scope for borrowing from 'relative/ neighbour/ friends', mahajan, NGOs and banks. Collateral for loan ('land and building', 'machinery and equipment', 'personal assets of owner') is not only obstacles most of the solar energy stakeholders and also highly significant rate of interest per annum is burden of solar energy stakeholders' borrower. The coefficient of sources of borrowing and collateral for loan is statistically moderate significant impact on daily generates solar energy performance.

As we can see regression, respect to all others regressors, results show that maximum or minimum daily generates solar energy performance have a higher probability of being minimum generate of solar energy than the maximum generate of solar energy. Amount of loan has a significant coefficient and thus has advantage over the maximum generate of solar energy technologies. Low cost solar energy technologies is better than high cost solar energy technologies, later has a significant positive impact on the logit, although statistically the effect of rate of interest is significant, but rate of interest is sensitivity to log of daily generate solar energy power in one hand and other hand coefficient of collateral is negative and significant but coefficient of borrowing is positive and highly significant. This positive coefficient reflects the relatively higher Log of daily generate solar energy power in Bangladesh. Thus, other things remaining same, if high cost solar energy technologies up to become low cost, each stakeholder will purchase solar energy technologies. The coefficient of market information on solar energy is statistically significant in the equations. Market information on solar energy is likely to have a positive effect through its positive impact on solar energy power productivity. This effect has been counterbalanced by a negative Operational risks effect on solar energy productivity. The coefficient of dummy form (yes=1) 'Insurance on solar energy technology' has positive impact and significant on solar energy productivity.

However, together all the regressors have a significant impact on the log of daily generate solar energy power, as the LR statistic is 93.57, whose *p-value* is about 0.00, which is statistically significant. A more meaningful interpretation is *in terms of odds*, which are obtained by taking the antilog of the various slope coefficients. Whereas the McFadden R^2 (R^2_{MCF}) value is 0.67, although, this value is overplaying the importance of goodness of fit in models, where the regressand is dichotomous and maximum generate solar energy technologies needs for power will increase substantially.

The reasons behind the relatively limited financing for renewable energy in Bangladesh, thus far are multiple, market information is still largely unavailable, operational risks and regulatory uncertainty, high up-front costs of solar energy technologies, inadequate access to finance for research and development, and perception of high investment risks by financiers. Overall, financial institutions will aim to create a package that includes the total finance amount and the repayment terms, the interest rate, the repayment schedule and any guarantees or securities. The government should be also providing support for the successful solar energy projects. The challenge to develop climate-friendly and socially acceptable methods for supplying the ever increasing demand for energy services in Bangladesh will be managed by developing energy efficient markets, simultaneously with the promotion and use of innovative technologies, and developing local energy efficiency expertise in the finance sector, expanding technical expertise, energy efficiency solutions and service providers.

6. Summary and Conclusion

The Bangladesh Government is actively promoting solar energy and energy efficiency in Bangladesh. According to Martinot, E. (2001), the Renewable Energy Policy of Bangladesh, which was drawn up with assistance from GIZ and UNDP and adopted in December 2008, sets a

target of satisfying 5% of total power demand from renewable energy by 2015 and 10% by 2020. This will be a focal point for 'Sustainable Energy' development and promotion which are renewable energy and energy efficiency. It has a national security benefit as it reduces energy imports (i.e. increase government reserves) and gradually diminishing the rate at which domestic energy resources are depleted. As these progresses, Bangladesh Bank could also be involved to review their concessional refinancing schemes to encompass more products as well as review existing ones.
To analysis primary data collected for used cross sectional study to be considered about allied factors for solar energy. The multiple logistic regression models will be used to identify the determinants of daily generate solar energy power in Bangladesh that is accelerating economic growth of a nation. Dependent variables dummy of solar energy (= 1, if daily generate solar energy performance is maximum, otherwise minimum) have been included. The expected sign of explanatory variables coefficients are positive and or negative respectively, whose *p-value* is statistically significant.

When successful, these new approaches could be capable of triggering the involvement of commercial banks. Point of view of banking and financing institutions and risks associated with solar energy and energy efficiency technologies. In recent years new financing models have been developed based on local capacity and higher involvement of consumers (Marques and Fuinhas, 2012). The rationale behind these deal structures is to prepare young enterprises for later growth capital from more commercial sources. It can be expected that in the near future these emerging and still perceived high risky sectors will continue to rely at least partly on non-commercial investment. Eventually though, solar energy and energy efficiency project development will have to be induced by market-based incentives, allowing them to attract conventional sources of finance. One may argue that people could make simultaneous decisions on adoption in order to aid the understanding of motivations for households to switch to renewable electricity.

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Appendix

A-1: Refinancing Scheme from Bangladesh Bank on Solar Energy, Biogas & Effluent Treatment Plant (ETP) under the following terms and conditions:

Letter No., Circular No, & Date	A. Solar Energy	Description for Urban Area	Description for Rural Area
➢ ACSPD Circular No: 06; October o3, 2009 ➢ ACD Letter No: 01 June 20,2010, and ACD Circular No: 09 April 08,2010 (Please follow ACSPD Circular No: 06 October o3,2009) ➢ SDP Circular No: 02 September11,2011 (Please follow ACSPD Circular No: 06 Octobero3,2009)	Solar Panel Capacity	170 watt (min.) & 520 watt (max.)	Residential: 10 watt (min.) & 130 watt (max.) Commercial: 520 watt (max.)
	Maximum Loan	BDT. 60,000/- (min.) & BDT. 1, 75,000/- (max.)	Residential: BDT. 10,000/- (min.) and 70,000/- (max.) Commercial: BDT. 1, 75,000/- (max.)
	Eligibility for loan approval	Individual/ collective households/ business institutions	Individual/ collective households/ business institutions
	Debt- Equity Ratio	Upon Bank-Customer relationship	Upon Bank-Customer relationship
	Interest rate at customer's end	Direct: current bank rate 5% + Maximum 4%	Direct: current bank rate 5% + Maximum 4%
		Credit wholesaling through NGO linkage: current bank rate 5% + Maximum 5%	Credit wholesaling through NGO linkage: current bank rate 5% + Maximum 5%
	Loan repayment duration for customer and interest calculation	Principal and interest payment by 3 years; quarterly interest payment	principal and interest payment by 3 years; quarterly interest payment
	Loan repayment duration under refinancing scheme	Principal and interest payment by 3 years; quarterly interest payment	principal and interest payment by 3 years; quarterly interest payment
	B. Bio gas Plant	**Establishment of plant within the existing farms**	**Integrated plant and cattle farm**
	Bio digester	Production: 1.2 m^3 (min.) & 4.8 m^3 (max.)	Production: 4 Cows (min.) & 4.8 m^3 (max.)
	Maximum Loan	BDT. 18,000/- (min) & BDT. 36,000/- (max.)	BDT. 3, 00,000/-(lacs) (max.)
	Eligibility for loan approval	Individual/ collective households/ business institutions	Individual/collective households/ business institutions
	Debt- Equity Ratio	Upon Bank-Customer relationship	Upon Bank-Customer relationship
	Interest rate at customer's end	Direct: current bank rate 5% + Maximum 4%	Direct: current bank rate 5% + Maximum 4%
		Credit wholesaling through NGO linkage: current bank rate 5% + Maximum 5%	if there is an agent/ intermediary working for bank then, current bank rate 5% + Maximum 5%
	Loan repayment duration for customer and interest calculation	Principal and interest payment by 3 years; quarterly interest payment	Principal and interest payment by 3 years; quarterly interest payment
	Loan repayment duration under refinancing scheme	Principal and interest payment by 3 years; quarterly interest payment	Principal and interest payment by 3 years; quarterly interest payment

	C. ETP & HHK Plant	**Production & ETP Treatment**	**Bricks Capacity**
	Effluent plant (Chemical and biological ETP with local and import expenditure) & Hybrid Hoffman Kiln (HHK) Plant must Settle	Production: Daily 5 tons (min.) & 20 tons (max.) ETP Treatment: Daily 500 m^3 (min.) & 2000 m^3 (max.)	Single/Double Kiln 15 million (min) & 30 million (max.)
		BDT.1,00,00,000/- (crore) (max.)	Total Refinance Scheme BDT. 30/- crore; Each Project 2/- crore (max.)
		Direct: current bank rate 5% + Maximum 4%	Direct: current bank rate 5% + Maximum 4%
		Principal and interest payment by 5 years; quarterly interest payment	Principal and interest payment by 5 years; quarterly interest payment

Source: BRPD (Banking Regulation and Policy Department) Circular, Bangladesh Bank