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Development of renewable energy financing in Bangladesh in response to the central bank's policy initiatives

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Abstract

The public concern of the state of energy and environment has been growing rapidly mainly due to growing energy use, increasing environmental degradation and declining non-renewable energy resources. Financial institutions hold a unique position in an economic system that can affect economic activities through their financing activities, and thus also can influence energy sustainability. Financial institutions of Bangladesh are undertaking energy sustainability initiatives mainly as part of their green banking and financing activities. In the financial sector, related development is taking place mainly in response to the initiatives undertaken by the central bank- Bangladesh Bank. Especially, the 'Green Banking Policy Framework' of the central bank requires banks to save energy resources and financing renewable energy sector. The central bank is also offering refinancing facilities to the commercial banks to finance renewable energy sector. There is no doubt that a sustainable energy planning and implementation is the need of the time and green financing might be a critical positive force not only to handle the growing energy demand but also to minimize environmental degradation. Alongside banks and other financial institutions, some of the stakeholders are responding positively to the initiatives of the central bank. On the above background, the paper is about examining the renewable energy initiatives of the central bank of Bangladesh and illustrating the responses of the financial sector to the sustainable energy initiatives. The paper, a case based study, identifies that renewable energy financing received tremendous momentum in the country in recent years that have already started offering noteworthy benefits to the low income rural people.

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1 Introduction

To sustain, policy makers of both developed and developing countries are focusing on environmental issues like reduction of greenhouse gas emission, minimization of pollution, access to energy, energy saving, and producing and using renewable energy. In this connection, the roles of a number of stakeholders are well-recognized. Banks and financial institutions hold a unique position in an economic system that can affect production, business, and other economic activities through their financing activities, and thus also can influence sustainable development strategies. The nexus between financial services and sustainable development through investment has become evident over the years and the evidences indicate that financial industry may have a major influence on who in the society gets access to financing; how financial services benefit the people; and how a financed project cause environmental destruction [1]. Today, an increasing number of banks are going green by providing innovative products to support activities that are not hazardous to environment and help conserve environment. Environmentally responsible banking services or green banking is conducted in such areas and in such manners that help overall reduction of carbon footprint and other pollutions; and help preserving scarce resources for future generation. Thus, green banking activities can contribute greatly in realizing the green growth by promoting green industry and green energy.

The Perspective Plan of Bangladesh 2010–2021 has provided the road map for materialization of the national goals of attaining the sustainable development agenda in the Vision 2021, and it is recognized in Bangladesh's development strategy that the goal of sustainable development would not be possible to attain if energy sustainability cannot be handled effectively. In a resource-constrained developing country like Bangladesh, finance is a powerful intervention that can contribute in the process. Of the different stakeholders, some environment related initiatives of the Bangladesh Bank is remarkable. Banks in Bangladesh have brought noticeable change in the area of green banking in response to the Central Bank's initiative. The paper is an attempt to examine the renewable energy initiatives of the central bank of Bangladesh and illustrating the responses of the financial sector to the sustainable energy initiatives. Both primary and secondary data are used to accomplish the objective of the paper. A few mini cases are accommodated in the paper to identify the implications of renewable energy financing in the country.

2 Energy sustainability and renewable energy: conceptual issues and global development

'Sustainable Energy', 'Renewable Energy', and 'Green Energy' are used interchangeably in the relevant literature, which is energy that can potentially be kept up well into the future without causing harm for future generations. Such

energy can be replenished that is essentially from inexhaustible sources of which include solar, wind, water, biomass and geothermal. By contrast, fossil fuels (oil, gas and coal) are not treated as sustainable because the Earth's supplies of crude oil will eventually run out. Moreover, the use of renewable energy is also helpful in restricting harmful green-house gas emission. According to IEA [3], currently the energy sector accounts for roughly two-thirds of all anthropogenic greenhouse-gas emissions, and it is the growing use of fossil fuel which is responsible. However, given the current demand for energy, investment, and technology available, only renewable energy cannot meet the need and demand of the Globe. Thus, practically it is the term 'energy sustainability' that is at the center. Conceptually the energy sustainability issues mainly include Energy Access, Energy Efficiency and Renewable Energy. These three issues are closely associated and the first SE4ALL Global Tracking Framework report concluded that it is more feasible to achieve the three objectives jointly than to pursue any one of them individually (as reported in the Guardian on September 10, 2014).

2.1 Renewable energy and environment

Policy-makers are becoming increasingly attentive to green energy heating in recent time, and renewable energy targets and other support policies, now in place in 164 countries, powered the growth of solar, wind and other renewable technologies to a record-breaking energy generation capacity: about 135 GW of added renewable energy power increasing total installed capacity to 1,712 GW, up 8.5% from the year before. Despite the world's average annual 1.5% increase in energy consumption in recent years and average 3% growth in Gross Domestic Product, carbon dioxide (CO_2) emissions in 2014 were unchanged from 2013 levels. For the first time in four decades, the world economy grew without a parallel rise in CO_2 emissions [7].

2.2 Energy sustainability in global context

According to REN21 [6], together, renewable energy sources meet almost one-fifth of global final energy consumption, including traditional biofuels, such as fuel wood. At the end of 2013, the total global power capacity generated from renewable energy had exceeded 1,560 GW, up 8% from 2012, supplying an estimated 22% of global electricity (16.4% in hydropower, 2.9% in wind power and 1.8% in biomass power). Today, at least 144 countries, two thirds of which are developing countries, have renewable energy targets in place, up from 138 countries one year before, and the rise of developing world support contrasts with slackening of policy support in some European countries and the United States. In China, new renewable capacity surpassed for the first time new fossil fuel and nuclear energy capacity in 2013. High levels of penetration of different forms of renewable energy meet e.g. 33.2% of electricity demand in Denmark and 20.9% in Spain from wind power, and 7.8% in Italy from PV in 2013. REN21 [6] noted, as of early 2014, at least 24 countries had adopted renewable heating (and cooling) targets and at least 19 countries had obligations at the national or state/provincial

level, and as of early 2014, at least 63 countries used regulatory policies to promote the production or consumption of biofuels for transport.

In connection with energy sustainability, some collective Global initiatives are inspiring. In December 2010, UNGA adopted a resolution designating 2012 as the 'International Year of Sustainable Energy for All' that also requested the UN Secretary-General, in consultation with relevant agencies in the UN system and UN-Energy, to organize and coordinate activities to be undertaken during the International Year of Sustainable Energy for All. In that resolution, the UNGA recognized that access to modern affordable energy services in developing countries was essential for the achievement of internationally agreed development goals, including the Millennium Development Goals, which would help reduce poverty and improve the conditions and standard of living for the majority of the world's population. In response to the resolution 'Sustainable Energy for All' initiative was undertaken to realize sustainable energy for all by 2030. The Secretary-General set three interlinked objectives to be achieved by 2030: providing universal access to modern energy services; doubling the global rate of improvement in energy efficiency; and doubling the share of renewable energy in the global energy mix [4].

In order to achieve the three objectives of Sustainable Energy for All (SE4ALL) by 2030, current annual investments need to be doubled in the areas of energy access, energy efficiency and renewable energy [9]. As of today, more than 100 countries (including 85 developing countries) have partnered with Sustainable Energy for All. In 2014, SE4ALL concentrated its efforts to promote the SE4ALL Country Action Process on 30 focus countries, in the first phase. Concrete progress has already been made in many more, through partners' support for developing action agendas, investment prospectuses, energy policies, rural electrification plans, and strategies for scaling up clean cooking solutions. The International Renewable Energy Agency (IRENA), as the SE4ALL renewable energy hub, has also launched the 'REmap 2030' report, a roadmap to double the share of renewable energy by 2030. Amongst the report notable findings is that, taking external costs into account, the transition to renewable can be cost-neutral. SE4ALL has been working built a strong network to support implementation [7].

2.3 Investment and financing requirements to attain energy sustainability

Financing and investing in renewable energy makes economic sense, apart from its contribution to emission reductions. According to the International Energy Agency [3], globally, projected investments of USD 630 billion in the renewable energy sector by 2030 would translate into at least 20 million additional jobs – 2.1 million in wind energy, 6.3 million in solar photovoltaic, and 12 million in biofuels-related agriculture and industry. Apart from its higher direct job creation potential, renewable energy is also expected to secure jobs in industries by reducing related emissions and by reducing the costs of production. The prospect of investing in the renewable sector at the country level is encouraging in some developing countries such as China and India. The Clean Development Mechanism (CDM) has helped expand the reach of renewable energy projects for power production to a number of low-income countries. Today, it is obvious that

the use of energy, the types of energy used and the lack of access to sufficient energy have far reaching implications for a city's economic development, its environmental health and for the poor. Economies which implement sustainable energy and climate action plans reduce their vulnerability to energy scarcity [5].

Banks and financial institutions (FIs) could be a critical stakeholder in the process of attaining energy sustainability. Banks can affect productions, businesses, and other economic activities through their financing activities. Green banks (GB) do not only improve their own standards but also affect socially responsible behavior of other businesses. Broadly, GB rest upon five pillars [1]. First one is related to the 'green vision' of a bank. It is the basic principle. Practically, activities and operations of banks cannot completely discard environmental harm. In most cases, it is about minimizing harm. Second and third pillars are connected with banks' in-house activities and operation and financing. These are connected with a bank's green efforts to minimize environmental risks and saving scarce resources. Fourth pillar is concerned with supporting other stakeholders and cooperation. Transparency of a green bank is a crucial component in its sustainable operation. It is concerned with providing relevant information and responses of the stakeholders on the activities of banks. All these pillars are integrated and crucial to ensure sustainable green banking. Generally, a section of the society directly and the entire society indirectly is the beneficiary of the 'external benefits' offered through green banking. By supporting renewable energy initiatives and uses, banks may also contribute in promoting lives of the marginalized.

3 Policy initiatives in Bangladesh to promote renewable energy financing

Bangladesh government formulated an Environmental Policy in 1992 and made commitments as a signatory of a number of Multilateral Environmental Agreements to protect environment. Environment Conservation Act (ECA) 1995 was adopted to conserve and improve the environmental standards and The Environmental Conservation Rules, 1997 was promulgated to broadly define management of toxic and hazardous substances for disposal of waste from different categories of industries. Under the Environmental Conservation Rules 1997, depending on the environmental impact of specific industries, the industries of the country are classified into green, orange-A, orange-B, red category. Depending on the specific industry category, the industries are required to provide environmental examination/assessment report to get environmental clearance of the industrial unit, and to obtain financing facilities. To promote sustainable energy in the country, a Renewable Energy Policy was prepared and various action plans were undertaken with the target to generate 5% and 10% of total power production by 2015 and 2020 respectively. The policy aimed to harness the potential of Renewable Energy (RE) resources and dissemination of RE technologies in rural, sub-urban and urban areas; facilitate both public and private sector investment in RE projects; develop sustainable energy supplies to ensure energy supply security and scale up contributions of RE to overall electricity and

heat production. In 2012, the government has set up Sustainable and Renewable Energy Development Authority (SREDA) and has finalized Sustainable Energy Development Act, 2011. To encourage private sector participation in the energy sector, the government has waived import duty from importation of all capital machinery relating to energy generation, energy efficiency, energy conservancy and renewable energy. Tax benefits and VAT waivers have also been offered to the RE equipment and related raw materials.

Green banking received significant emphasis mainly since 2010 when a comprehensive circular (BB BRPD Circular No-2, February 27, 2011) of BB titled 'Policy Guidelines for Green Banking' was circulated in February 2011. As per the circular, commercial most banks adopted a comprehensive GB policy as a part of the central bank's efforts to make banking practices more responsible to social and environmental causes (later the time circular was implemented for non-bank financial institutions or NBFIs). Besides introducing internal environment management, the FIs were expected to introduce environment friendly green financing to address the environmental challenges of the country.BB has also issued a circular on environmental risk management in 2011 to handle environmental risks in bank financing to different sectors (BB is in the process of updating the guideline). Recently, BB has undertaken 'Financial Sector Support Project' (Jointly funded by IDA and BB own Fund), under which a long term financing window was launched for greening the manufacturing firms and exports oriented industries. BB has also decided to come up with USD 200 million medium to long term green fund for supporting textile, leather sector and other products for ensuring efficiency in using resources.

To encourage FIs, BB switched over to solar-powered lighting by setting up a 20 kilowatt solar panel in 2010, and FIs were advised to finance in solar energy, bio-gas plant, Effluent Treatment Plant and Hybrid Hoffman Kiln in brick field under refinance program of BB. BB introduced three types of refinancing facility, BB Refinance Scheme, ADB supported Refinance Scheme and Refinance scheme funded by Shariah based banks and FIs. As of now, 50 products are placed under 11 categories (renewable energy, energy efficiency, solid waste management, liquid waste management, alternative energy, fire burnt brick, non-fire block brick, recycling and recyclable product, green industry, ensuring safety and work environment of factories and miscellaneous) under the refinancing scheme. As the FIs have capacity disincentive to reach the remote people, BB introduced a linkage model with MFI and intermediary agent and is giving special permission to some experienced suppliers and MFIs to act under the model in the Solar Home Systems (SHS).

4 Responses to the central bank's renewable energy initiatives and implications

Bangladesh Bank's initiatives have made significant changes in regard to the creation of green governance frameworks in the FIs. A recent BIBM survey [2] reveals that almost all FIs have formulated green banking policies and almost all FIs (banks and NBFIs) have Green Banking Cells. Most of the policy documents

are replications of Bangladesh Bank's policy guidelines. By the time, around half of the FIs have formulated one or more sector specific environmental policy guideline and in almost all FIs, an executive is responsible for heading the Green Cell. The BIBM study also found that around 70% FIs of the country are engaged in green financing activities either using own funds or availing refinancing facilities of BB.

Till date, of the total financing by the FIs, proportion of green financing is insignificant. However, it is a good staring and over the years the financing to the green projects/activities increased covering renewable energy, energy efficiency, fire burnt brick, solid and liquid waste management, recycling and recyclable products etc. that are categories as green finance by the BB. Segregated data on the issue has been made available only in recent time. BB's published data indicates that of the total green financing, over one-fifth portion were disbursed in the renewable energy projects in the year 2014, and the proportion increased to above 30% in the total disbursement for the January-March 2015 quarter. Of the other forms of green financing, fire burnt brick (energy efficient technology) and green industry (green building/construction) accounted for significant proportion of the total. BIBM Survey data reveal that three-quarters of the total clients of green financing belong to the rural Bangladesh. In terms of number of clients, most green financing facilities are availed to meet energy need of the people.

BIBM survey [2] illustrates significant market share of non-bank financial institutions (NBFIs) in the area of renewable energy financing (Figure 1). Others include State Controlled Banks (SCBs), Private Commercial Banks (PCBs), and Foreign Commercial Banks (FCBs). Of the contribution of individual institution, role of Infrastructure Development Company Limited (IDCOL) is remarkable. It has been playing a major role in bridging the financing gap for developing infrastructure and renewable energy projects in Bangladesh, and the company now stands as the market leader in renewable energy financing in Bangladesh. Alongside financing, financial intuitions are also engaged in awareness development and philanthropic activities using CSR funds. Some of these interventions are also connected with other areas of sustainability like agriculture, rural development, technology innovation etc. Of the outcome, financing to solar home systems offered noteworthy benefits to several households in the form of ensuring access to energy, better livelihood and rural development.

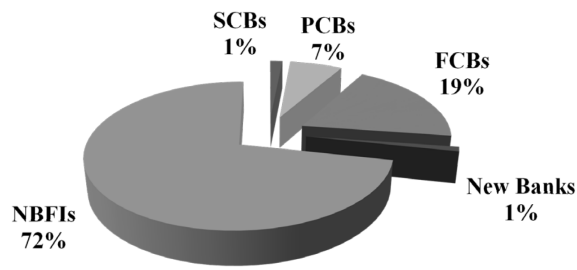
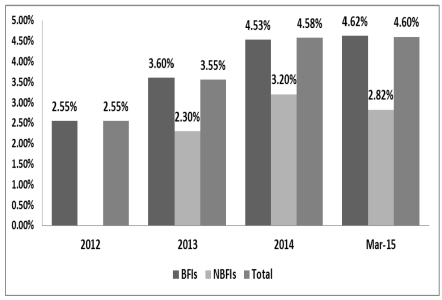
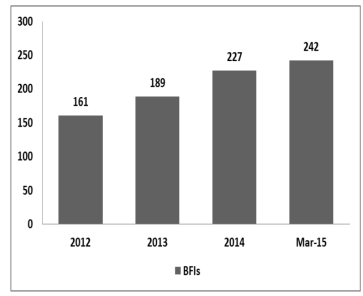


Figure 1: Market share of banks and NBFIs in Renewable Energy Finance Market (during January–March 2015).

It is well known that use of ICT and mobile technology brought notable positive changes in the area of channelling financial services. Currently a good number of banks are engaged in online and internet banking activities. Financial institutions use considerable volume of energy in their day to day activities. Any initiative to save electricity by the FIs would definitely contribute to the environmental and energy sustainability of the country. It is nice to observe that at least some branches and ATMs of FIs are run by the solar power (Figure 2). Some green banking activities can be directly linked with the sustainability of the agriculture sector like solar irrigation, green poultry and fishery intervention, bio-fertilizer and biogas. Some banks like Mutual Trust Bank Limited, Trust Bank Limited, Eastern Bank Limited, Islamic Bank Bangladesh Limited, etc. have been playing notable roles in these areas. Some of these have already accrued significant benefits to the rural people.



Number of solar powered branches of the total ranch.



Number of ATM/SME units powered by solar energy.

Figure 2: Use of solar power in branches and ATMs.

The following mini cases identify the implications of renewable energy financing for the demand side (Tables 1–5) and overall benefits of the BB's refinancing facilities (Table 6).

5 Concluding remarks

It is recognized that energy sustainability is a critical issue to address and sustainable energy or renewable energy must get required focus considering its remarkable economic, social and environmental impacts. It is probably the sector where most of the green banking intervention took place, and impacts were accrued. Contributions of a few FIs are already recognized locally and internationally. However, challenges are there. In some instances there are evidences of under-performance of renewable energy equipment, inadequate maintenance services, undue prices of equipment etc. These are critical success factors. In some instances local level bank management is not found adequately motivated to handle such financing. Moreover, future direction on grid connection is crucial to undertake different renewable projects in different areas. Currently, the country does not have any long term mapping on that. Handling of the issues by the policy makers would bring even better outcome.

Table 1: A poultry and fishery project obtaining benefits of BB refinancing.

Five members of a family of a village in the Comilla district in Bangladesh started a small poultry farm in 2007 which became a big project having about 15,000 adult poultry birds and 5,000 chicks over time. Being successful in poultry and fisheries, they felt responsible to people, society and environment and took initiative to set a biogas plant using litter of poultry birds. BRAC Bank Ltd. financed BDT 1.5 million to the project under refinancing scheme of BB. Two domes of the biogas plant burn 14,000 kg of litter a day to produce 150 cubic meters of gas. The gas generates 8 KV power which meets total electricity requirement of the plant. And the rest of gas is used to fire 40 burners in the surrounding households. A large number of people of the village work in foreign countries and sent remittances. Success of the project encouraged a number of expatriates to invest in different productive sectors in the area.

Table 2: End-users successfully using the benefits of BB refinancing.

Mr. Jamal of Jamalpur, availed a loan of BDT 2 lac at 9% rate of interest in 2013 under Bio-gas plant scheme from Uttara Bank Ltd, on monthly instalment basis and set up a bio-gas plant in his existing cattle farm. Currently bio-gas is produced from his bio-gas plant using cow dung and after that the cow dung is used as manure in the agricultural land. Gas is used for cooking and for producing 5000w electricity in addition with diesel for using generator. This is his second loan from the bank. He used the first loan of BDT 2 lac for biogas plant for cooking purpose and the second one is for fulfilling the electricity requirements in his 'Poultry Farm'. He took help from 'Grameen Shakti' for installation as well as after sales services for his plants.

Table 3: A composite considers bio-gas a viable business.

Mr. Sabbir established a composite set up at Gazipur district. The firm uses recycled plastic poultry cases; poultry wastes are used for bio gas generation for fuel and electricity; and other wastes are used for compost fertilizer. The firm uses manure of the poultry to produce biogas which is used for electricity generation and cooking for farm laborers. To build this eco-friendly poultry composite, Mr. Sabbir was awarded the best trophy in the year 1998 from the Directorate of Youth Development. The gas is currently used for household cooking and generating electricity for the poultry firm. The loan for bio-gas has already been repaid by the borrowers satisfactorily, as reported by the Mutual Trust Bank Limited in August 2015.

Table 4: Solar mini-grid under BB refinancing offering beneficial outcome.

SOLARIC, an NGO, installed a solar mini-grid in Kapasia Upazilla, a sub urban area near Dhaka. Industrial Development Leasing Company (IDLC) financed SOLARIC for installing the solar mini-grid under BB refinancing facility. The capacity of the mini-grid is 2.8 KW and the cost is BDT 0.4 million. One schedule bank branch is availing prepaid electricity produced by solar mini-grid installed by SOLARIC. The branch is in grid area but load shedding is very high. So it is convenient for them to use the power of mini-gird. There are also other clients that are using prepaid electricity from that mini-grid.

Table 5: Solar irrigation has huge potentials to support rural farmers.

A group of farmers of some villages in Panchagor, a northern district in Bangladesh availed financing for solar irrigation using cluster approach. The loan was provided for crops, pump for irrigation and drainage for ten years. Mutual Trust Bank Ltd helped to form the cluster. First of all, bank organized the farmers and conducted feasibility study in order to know the potentials of production. Then, farmers were asked to form a cooperative which usually consists of 30–35 farmers. Bank offered BDT 30 lac for irrigation pump, which was owned by the cooperative. For the loan, the cooperative offered guarantee to the bank. The Bank also helped in procuring pump by contracting suppliers and ensured service facility including installation of pumps. As these pump operated by solar, banks made arrangement to install solar panel and made expenditure to prepare water distribution system. Apart from this, bank took care of back-up facility which was diesel operated in order to ensure smooth flow of water. The project indicates huge potential of the project in rural Bangladesh. Note: Based on field level data.

Table 6: Beneficiaries under BB refinancing scheme (end 2015).

• Solar home system: BDT 233.05 million was refinanced against establishment of 5,954 SHS units; at least 5,954 families were getting benefit from the SHSs. • Solar irrigation pump: BDT 68.27 million was refinanced against 12 solar energy driven irrigation pumps; number of beneficiary farmers were 225 and land under irrigation were about 1,240 bighas. • Solar PV module assembly plant: BDT 569.28 million was refinanced against establishing 4 Solar PV modules that employed 100 people. • Bio-gas plant: BDT 597.95 million was refinanced against establishing 1,624 bio-gas plants. Source: Bangladesh Bank.

It is pleasant to observe that most of the clients of renewable energy financing are from rural areas. It is particularly noteworthy when very insignificant number of rural clients gets access to banks' credit as a whole. Thus, alongside affecting environmental concerns, the interventions are expected to bring notable positive changes in rural livelihood. It indicates that this is one of the crucial ways by which several goals of sustainable and green growth of the country can be attained by offering access to finance and other basic services through improving rural economy and the livelihood of the marginalized people. In many rural areas, there aren't many banks or institutions that provide microfinance to green ventures. Direct bank lending to the end users in the rural areas does not seem feasible in most instances and in a number of instances, using intermediary and partnering organizations are offering better outcome. Especially, integrated approach of some micro finance institutions in offering ground level renewable energy financing and other green services are really encouraging and related to the improvement of community livelihood.

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