Aide-Memoire
Scaling-up Renewable Energy Program in Low Income Countries (SREP)
Joint MDB Mission to Bangladesh
July 27-30, 2015

I. Introduction

1. A joint Multilateral Development Bank (MDB) team (including representatives from the International Development Association (IDA), the International Finance Corporation (IFC), and the Asian Development Bank (ADB))[1] visited Bangladesh in the period July 27-30, 2015 to conduct a Joint Mission for the Scaling-up Renewable Energy Program in Low Income Countries (SREP). The main objectives were to: (a) discuss progress on the preparation of the SREP Investment Plan (IP) with the Government and the main stakeholders; (b) discuss with the Government and agree on the prioritization of renewable energy projects to be supported under the SREP; and (c) agree on the next steps and the timetable to finalize the investment plan and to submit it to the SREP Sub-Committee for approval in November 2015. A list of officials met during the mission appears in Annex 1. The team wishes to express its deep appreciation to the Economic Relations Division (ERD), Power Division, Sustainable and Renewable Energy Development Agency (SREDA), Infrastructure Development Company Limited (IDCOL) and others for the productive discussions, access to information and excellent cooperation during the review mission. This Aide Memoire was agreed to be classified as Public document under World Bank's Access to Information Policy.

2. Prior to this mission, an advanced preparation grant request in the amount of $300,000 for IP preparation activities was processed and a consulting firm, DH Infrastructure, in association with Black and Veatch and Prokaushali Sangsad Ltd, was appointed to assist the Government of Bangladesh in preparing the IP.

3. On June 8, 2015, SREDA organized a stakeholder consultation to solicit feedback on the comprehensive assessment of various renewable energy technologies in Bangladesh. The list of invitees is provided in Annex 2. Feedback received from the consultation was incorporated into the draft IP which was the basis for discussion during this Joint Mission.

II. Mission Activities

4. The MDB team held discussions with the ERD, Power Division, SREDA, IDCOL, Bangladesh Energy Regulatory Commission (BERC), Bangladesh Power Development Board (BPDB), and development partners including the UK Department of International Development (DfID), the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), the KfW Development Bank, United Nations Development Program (UNDP), and the United States Agency for International Development (USAID), as well as the Bangladesh Solar and Renewable Energy Association (BSREA), private sector companies, research institutions and civil society organizations (CSOs). The mission meeting schedule is provided in Annex 3.

[1] The MDB Mission Team comprised: Gevorg Sargsyan (Program Manager, World Bank), Zubair Sadeque (Senior Energy Specialist, World Bank), Joonkyung Seong (Energy Specialist, World Bank), Ashish Shrestha (Energy Specialist, World Bank), Joyita Mukherjee (Senior Operations Officer, IFC), Chandrasekar Govindarajalu (Senior Energy Specialist, IFC), Gaetan Tiberghien (Principal Investment Officer, IFC), Jiwan Acharya (Senior Climate Change Specialist, Clean Energy, ADB), and Hongwei Zhang (Finance Specialist, ADB)

III. Summary of Mission Findings and Agreements

5. **Comprehensive assessment of renewable energy technologies**: The Government conducted a comprehensive assessment of renewable energy technologies in consultation with the relevant stakeholders, including MDBs. Those technologies included: utility-scale solar PV; grid-connected solar rooftop; solar home system; solar irrigation; solar mini-grid; wind; biomass; biogas; waste-to-energy; small hydro; geothermal; hydrokinetic; tidal; and improved cookstoves.

6. The analysis suggested that of the above renewable energy technologies, the following were not technically viable: (a) hydrokinetic and tidal due to immature technologies, weak commercial viability, and lack of adequate resource assessment; and (b) geothermal due to lack of adequate resource assessment.

7. **Stakeholder consultations**: During the Joint Mission, the Government conducted stakeholder consultations to discuss the main findings of the comprehensive analysis of various renewable energy technologies and the proposed priority renewable energy technologies to be supported under the SREP, incorporating feedback from the previous consultation on June 8, 2015. Key stakeholders in the sector, including IDCOL, BERC, BPDB and development partners, agreed with the analyses results and the proposed options for renewable energy technologies. During the mission (July 29), the Government also conducted broader public consultations with representatives of private sector, civil society organizations (CSOs), research institutions and academia. The participants were overall supportive of the main findings, conclusions and recommendations regarding priority renewable energy technologies to be supported in Bangladesh. The consultation meeting suggested to include in the priority list some other options such as improved cookstoves and biogas for domestic cooking. Considering the fact that the ongoing programs for these technologies are adequately funded for the near to medium term, the Government decided not to consider these technologies for SREP funding, but these would be considered for subsequent climate finance like the Green Climate Fund (GCF).

8. **Final list of priority renewable energy technologies to be supported in Bangladesh**: From the list of technically viable renewable energy technologies, the Government determined the priority renewable energy technologies using the following criteria agreed with the key stakeholders and MDBs, as well as taking into account the suggestions during stakeholder consultations: (a) scalability to promote transformational impact, measured by resource potential; (b) availability of sites to take into account the country-specific constraints on land availability and the longer-term effects of climate change; (c) unexploited market potential; (d) readiness for implementation; and (e) economic and financial viability with competitive levelized energy costs (LECs).

9. Based on prioritization analysis, the Government identified the following priority renewable energy technologies to be supported with a combination of SREP funds (subject to approval of SREP IP), public financing, and private sector investments- i) utility-scale solar PV and wind; ii) grid-connected solar rooftop; iii) solar irrigation; iv) solar/hybrid mini-grids (both grid connected and off-grid), and v) waste-to-energy development support[2]. These

[2] The successful solar home systems (SHS) program implemented by IDCOL was not considered for SREP funding because the program has reached sufficient scale (over 3.5 million installed) with a large number of partner organizations involved in the business of selling SHS, which makes the program a good candidate for leveraging commercial financing. A commercial financing study is currently underway under the World Bank

technologies were selected based on the above criteria. While the wind resource potential is still not fully established, an assessment is currently underway with support from USAID. Subject to a favorable assessment of the wind resources, utility-scale wind development will be considered for SREP funding. These selections are also aligned with the current national policy and strategy, including the National Renewable Energy Policy 2008 and the 500MW Solar Power Programme.

10. The Government also agreed to include in the IP a broader set of renewable energy priorities to help access other sources of climate finance, such as the Green Climate Fund (GCF). These included utility-scale wind and other renewable energy, scaling up solar irrigation, biogas for household and commercial use, scaling up improved cookstoves, waste-to-energy investment, and grid integration of renewable energy. All these options were identified as a priority for renewable energy development in Bangladesh in the medium to long term to be supported by subsequent climate funds.

11. **Business models of priority renewable energy technologies**: Although concrete business models will be determined at a later stage, subject to further project preparation and feasibility studies, potential options to achieve transformational impact and scaling-up of the technologies were discussed during the mission. It was agreed that reverse auctions/tenders for utility-scale solar PV and wind will be the right approach for Bangladesh to follow that would allow for price discovery and enable taking advantage of the continuous technology evolution and cost reduction around the world. Such auctions/tenders can be carried out in both cases where projects are on public land under public-private partnership or on private land where site identification and development are the responsibility of the private bidders. Selection of technologies between solar PV and wind will be subject to implementation readiness and feasibility at the time of project development. Grid-connected rooftop solar PV would allow for both private sector aggregators to bid for blocks of smaller rooftop areas and large-scale industrial customers who own or lease industrial rooftop areas[3]. There are existing business models for solar irrigation and mini-grids that IDCOL is promoting. Building on the success of the solar home systems program, the current model is based on private operators installing and operating irrigation pumps and mini-grids with concessional credit financing and capital buy-down grants channeled through IDCOL. The business models for scaling up solar irrigation and mini-grids as well as appropriate institutional arrangement will be developed based on the experiences of existing programs, and harmonize with existing successful business models in the market. Technical assistance would be provided in the case of waste-to-energy to conduct feasibility studies and help structure a proper public-private partnership model that would lead to investment in the next phase.

12. **MDB support for development of identified priority renewable energy technologies**: The MDB team discussed with the Government the potential support from MDBs in developing priority options in the country with a mix of SREP funds, MDB financing and private/public investments. Specifically, the MDB team agreed with the Government on

funded RERED II project to explore the options for transitioning the program towards commercial financing while ensuring that the SHS remain affordable to the relatively poorer segments of the population. As a complement to the SHS program, the recently initiated GIZ-IFC Lighting Bangladesh program is supporting dissemination of solar lanterns and pico-PV products through a market-based approach.

[3] An important policy barrier is the lack of a Feed-in-Tariff (FiT) policy providing for sufficient incentives for the rooftop program. BERC is currently drafting a FiT incentive mechanism, however this is considered rather a general guideline setting the ceiling for the tariff for rooftop program, and not a mandatory policy. For the rooftop program to be successful, a mandatory FiT policy will be needed that would send a clear signal to the market about the incentives.

the following potential engagement of MDBs in scaling up priority renewable energy technologies.

13. The IDA will support the Government to develop: i) utility-scale solar PV and wind (the latter, subject to viability of the wind resource potential); and ii) grid-connected rooftop solar PV. Complementing US$30-35 million of SREP funding tentatively allocated to these two options, IDA co-financing of around US$100-150 million will be considered (subject to availability of the IDA country allocation). In addition, an IDA partial risk guarantee of around US$100 million (again subject to IDA availability) could be made available to mitigate offtake risk that individual power producers may face subject to an assessment of the need for such risk facility. For the potential IDA financing, project preparation will need to be sufficiently advanced before Bank Board approval to ensure timely utilization of the commitment amount.

14. ADB confirmed its willingness to support the Government to scale up solar irrigation and mini-grids by mobilizing US$140 million of public sector financing along with US$30-35 million of the SREP allocation tentatively allocated to these options.

15. IFC confirmed its willingness to provide support for waste-to-energy development and transaction advisory support for auctions and public-private partnership structures for utility-scale solar PV and wind and grid-connected rooftop solar PV under consideration by the Government. Given the government's significant ambition to develop solar power and its commitment for the private sector to play a key role, IFC stressed its capacity to offer "blended finance" - a mix of concessional finance from SREP, commercial finance from IFC and other private sector investors for utility-scale renewable energy or rooftop solar PV. As an indicative example, roughly $15 million of SREP finds would be blended with $30 million of IFC financing and $100 million of other private sector investors for these projects. It should be noted that SREP financing channeled through IFC does not require sovereign guarantees.

IV. Timeline and Next Steps

16. The Government confirmed its intention to submit the SREP IP to the CIF Administrative Unit by September 30, 2015 to be included in the agenda for the next SREP Sub-committee meeting to be held on November 9-13, 2015. The Government and the MDB team agreed on the following timeline for completion of the SREP IP and submission for approval.

Task	Date
Revision of the draft IP	August 3-7, 2015
Public consultation (posted on the SREDA's website)	August 10-28, 2015
Independent expert review	August 10-28, 2015
MDB internal quality review	August 31-September 18, 2015
Finalization of the IP	August 31-September 18, 2015
Formal submission for SREP Sub-committee approval	September 30, 2015

LIST OF ANNEXES

Annex 1. List of Officials Met
Annex 2. List of Invitees to the Stakeholder Consultation on June 8
Annex 3. Meeting Schedule of the Joint Mission

Annex 1: List of Officials Met

Government Organizations		
Mr. Mohammad Mejbahuddin	ERD, Ministry of Finance	Senior Secretary
Ms. Rownaq Jahan	ERD, Ministry of Finance	Additional Secretary
Dr. Ahmad Kaikaus	Power Division, Ministry of Power, Energy and Mineral Resources	Additional Secretary
Mr. Md. Anwar Hossain	ERD, Ministry of Finance	Deputy Secretary
Mr. Md. Waliullah Mia	ERD, Ministry of Finance	Deputy Secretary
Mr. Tapos Kumar Roy	SREDA	Chairman
Mr. Siddique Zobair	SREDA	Member (EE&C)
Mr. Mahmood Malik	IDCOL	Executive Director & CEO
Mr. S. M. Monirul Islam	IDCOL	CFO and Head of Operations
Mr. Md. Enamul Karim Pavel	IDCOL	Head of Renewable Energy
Honorable Mr. A. R. Khan	BERC	Chairman
Mr. Rahman Murshed	BERC	Member
Dr. Salim Mahmud	BERC	Member
Engr. Md. Delwar Hossain	BERC	Member
Mr. K. M. Hassan	BPDB	Chairman
Development Partners		
Ms. Farzana Mustafa	DfID	Deputy Programme Manager
Mr. Al Mudabbir Bin Anam	GIZ	Senior Advisor, Sustainable Energy for Development (SED)
Mr. Tazmilur Rahman	KfW	Senior Sector Specialist, Energy
Mr. Sher Khan	USAID	Senior Energy Advisor
Mr. Md. Monwar Hasan Khan	UNDP	
Private Sectors and CSOs		
Mr. Dipal C. Barua	Bangladesh Solar and Renewable Energy Association	President
Mr. Md. Ataur Rahman Sarker	Filament Engineering Ltd.	CEO & Director
Mr. Nessar Maksud Khan	MAKS Renewable Energy Co. Ltd	Managing Director
Mr. Saiful Huque	Bangladesh Solar Energy Society	General Secretary
Mr. Quazi Ahmed Faruque	RahimAfrooz Renewable Energy	
Mr. Aruneem Mazumder	Energypac Green Solution	Manager – Green Division
Mr. Murrsalin Magfur	Maxtech Limited	
Mr. Md. Anisul Kabir	Dhaka Ahsania Mission Solar	
Ms. Ishrat Shebnam	Practical Action	
Mr. Mostafa Al-Mahmud		
Prof. Dr. M. Nurul Islam	BUET	
Dr. M. Shamsul Alam	Daffodil International University	

Annex 2: List of Invitees to the Stakeholder Consultation on June 8

Government Organizations		
Tapos Kumar Roy	SREDA	Chairman
Siddique Zobair	SREDA	Member (EE&C)
Shah Zulfiqur Haider	SREDA	Director
S.M. Sanzad Lumen	SREDA	Assistant Director (Solar)
Mohammad Bazlur Rahman	Power Division, Ministry of Power, Energy and Mineral Resources	Project Director (Joint Secretary), Wind Resources Mapping Project
Md. Abdur Rouf Miah	Power Cell, Ministry of Power, Energy and Mineral Resources	Director (Sustainable Energy)
Mr. Mahmud Malik	IDCOL	Executive Director & CEO
Mr. Formanul Islam	IDCOL	Deputy CEO
Dipta Majumdar	IDCOL	Officer, Technical
Ahmed Jahir Khan	BPDB	Executive Engineer
Sm. Zafar Sadeque	Bangladesh Rural Electrification Board	Director, Renewable Energy
S. M. Moniruzzaman	The Bangladesh Bank	Executive Director
Partho Pradip Sarkar	Local Government Engineering Department	Director, Sustainable Rural Energy
Md.Raisul Alam Mondal	Ministry of Environment and Forest- Energy Division	Director General
Brig. Gen. (Retd.) Md. Nazrul Hasan	Dhaka Power Distribution Company Limited	Managing Director
Brig General Md Shahid Sarwar (Retd)	Dhaka Electricity Supply Company Ltd	Managing Director
Ibrahim Ahmed Shafi Al Mohtad	Electricity Generation Company of Bangladesh	Project Director
Engr. Md. Kamrul Islam	North West Power Generation Company Ltd	Executive Engineer, P&D
Engr. Md. Salim Bhuiyan	Rural Power Company Ltd.	Chief Engineer
Md. Towfique Islam	Rural Power Company Ltd.	SE (P&D) and PD (Renewable)
Engr. Md. Shafique Uddin	West Zone Power Distribution Company Ltd.	Managing Director
Md. Seraj Uddin	Dhaka Water Supply and Sewage Authority	Deputy Managing Director (RP&D)
Mahfuza Khanam	Bangladesh Council of Scientific & Industrial Research	Director, IFRD
Mr. B M Enamul Haque	Dhaka North City Corporation	Chief Executive Officer
Mohammad Ansar Ali khan	Dhaka South City Corporation	Chief Executive Officer
Development Partners		
Zubair Sadeque	The World Bank	Senior Energy Specialist
Chandrasekar Govindarajalu	IFC	Senior Energy Specialist
Paul Hattle	ADB	Senior Climate Change and Clean Energy Specialist
David Hancock	GIZ	Program Coordinator
Dr. Khalequzzaman	GIZ	Specialist, Renewable Energy
ANM Zubayer	GIZ	Specialist, Renewable Energy
Tazmilur Rahman	KfW	Program Manager, Energy

Mr. Alamgir Hossain	UNDP	Programme Analyst, Environment & Energy
A.K.D. Sher Mohammad Khan	USAID	Sr. Energy Advisor
Zaki Md. Ziaul Islam	JICA	Associate Program Manager
Asna Towfiq	SNV	Senior Advisor, Renewable energy
Private Sectors and CSOs		
Md. Gofran	Grameen Shakti	Consultant, Biogas
Faruk-Ul-Islam	Practical Action Bangladesh	Head of Policy, Practice & Program Development
Taif Hossain Rocky	Practical Action Bangladesh	Project Officer
Shahid Khan	Bangladesh Biogas Development Foundation	Secretary
Dipal C. Barua	Bangladesh Solar and Renewable Energy Association	President
Academia		
Dr. Md. Ziaur Rahman Khan	Centre for Energy Studies (CES), Bangladesh University of Engineering and Technology	Director (CES)
Dr. Ijaz Hussain	Bangladesh University of Engineering and Technology	Professor
Dr. Mohammad Tamim	Bangladesh University of Engineering and Technology	Professor
Dr. Saiful Huque	Institute of Energy, DU	Professor
Dr. Rezwan Khan	United International University	Vice-Chancellor
Dr. Sayeed Salam	BRAC University	Chairperson, School of Engineering and Computer Science

Annex 3: Meeting Schedule of the Joint Mission

Time	Meeting
Monday, July 27, 2015	
9:30 - 10:30	Mission kick-off meeting
10:30 - 11:15	Check-in meeting with Acting Country Director, World Bank
11:30 - 12:00	Mr. Md. Anwar Hossain, Deputy Secretary, ERD
1:00 - 2:00	Dr. Ahmad Kaikaus, Additional Secretary, Power Division
2:30 - 4:00	Mr. Tasposh Kumar Roy, Chairman and Mr. Siddique Zobair, Member, SREDA
Tuesday, July 28, 2015	
10:00 - 12:00	Briefing for Development Partners
2:00 - 3:30	Mr. Mahmood Malik, Executive Director and CEO, IDCOL
4:00 - 5:00	Mr. A. R. Khan, Chairman, Bangladesh Energy Regulatory Commission
Wednesday, July 29, 2015	
10:30 - 12:30	Bangladesh Solar and Renewable Energy Association and CSOs
2:30 - 4:00	Targeted Private Sector Players
Thursday, July 30, 2015	
10:30 - 11:15	Mr. Mohammad Mejbahuddin, Senior Secretary, ERD
12:00 - 1:00	Chairman, Bangladesh Power Development Board