Renewable Energy in Bangladesh

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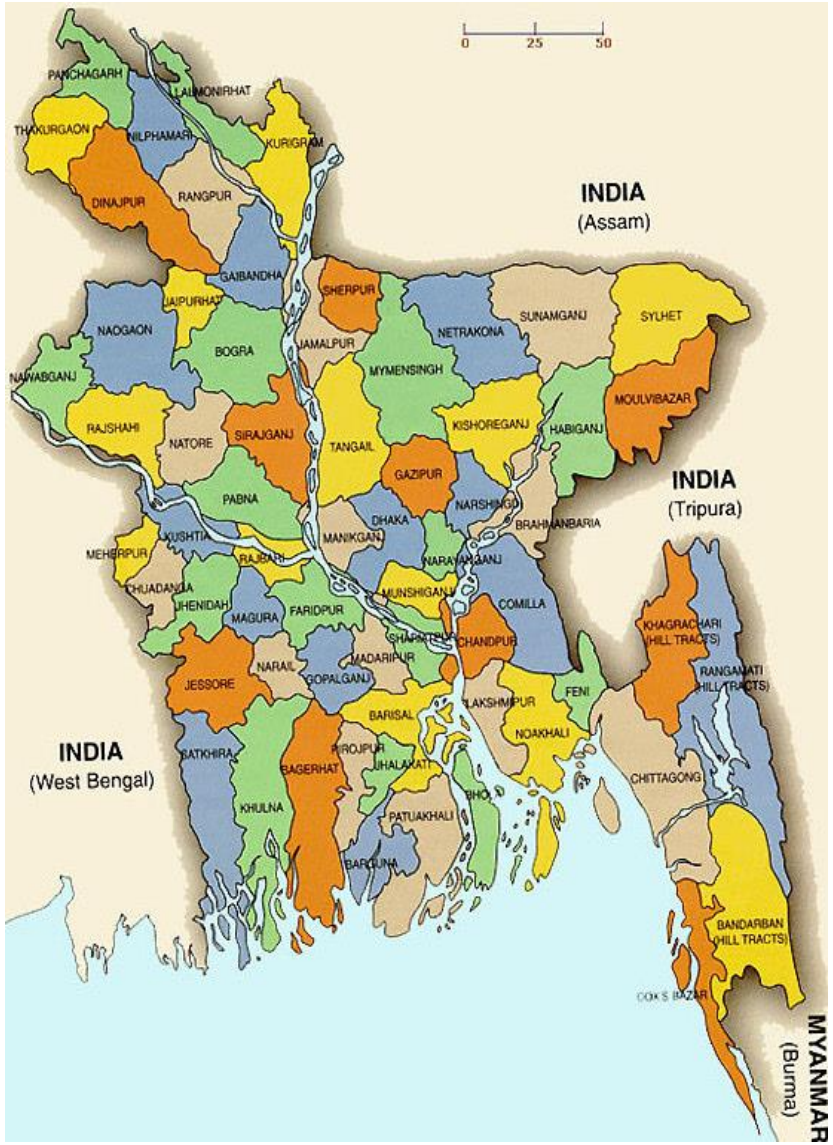
Bangladesh: Country Profile

- **Latitude: 20°34′ to 26°38′N** & **Longitude: 88°01′ to 92°41′E**
- **Total Area: 147,570** km²
- **Population** : **166.37**Million
- **Per Capita Income:$ 1610**
- **GDP Growth Rate 7.24%** (FY 2018–19)



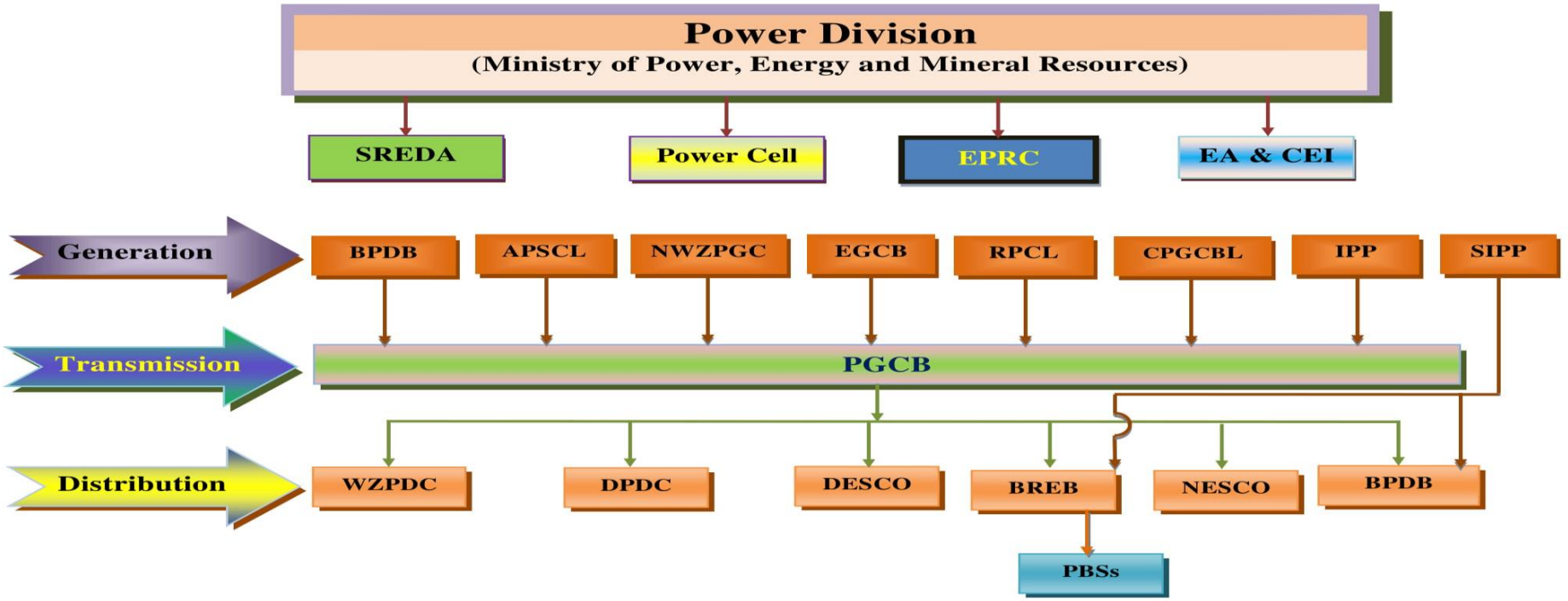
Sundarban :World's Largest Mangrove Forest

Cox's Bazar : World's Largest Sandy Sea Beach

Bangladesh's Power Sector: At a Glance

- Generation Growth : 10.2 % (Av.)
- Total Gen. Capacity : 17,576 MW
- Consumers : 28.7 Million
- Transmission Line : 10,680 Ckt. km
- Distribution Line : 4,40,000 km
- Distribution Loss : 9.98 %
- Per Capita Generation : 433 kWh
- Access to Electricity : 90%

Management Structure



Policy Landscape of RE in Bangladesh

"The State shall take endeavor to **protect and improve the environment** and to preserve and safeguard the natural resources, biodiversity, wetlands, forests and wild life for the present and future citizens".

[**ARTICLE 18A**, THE CONSTITUTION OF THE PEOPLE'S REPUBLIC OF BANGLADESH] [15th Amendment in 2011]

Policy Landscape of RE in Bangladesh

Renewable Energy Policy of Bangladesh 2008	Mandates 10 % of electricity to come from renewables by 2020.
Bangladesh Climate Change Strategy & Action Plan [BCCSAP] 2009	Mitigation & low carbon development- one of the six thematic areas
Bangladesh National Building Code[BNBC]	RE & EE options are included in the revised BNBC.

Policy Landscape of RE in Bangladesh

Quick Enhancement of Electricity and Energy Supply (Special Provisions) Act 2010	Provides for negotiating tariff of RETs on a case-by-case basis thereby overcoming inconvenience of a single tariff for a specific technology.
Sustainable & Renewable Energy Development Authority Act ,2012	To create SREDA for promotion of RE & demand-side EE&C in Bangladesh

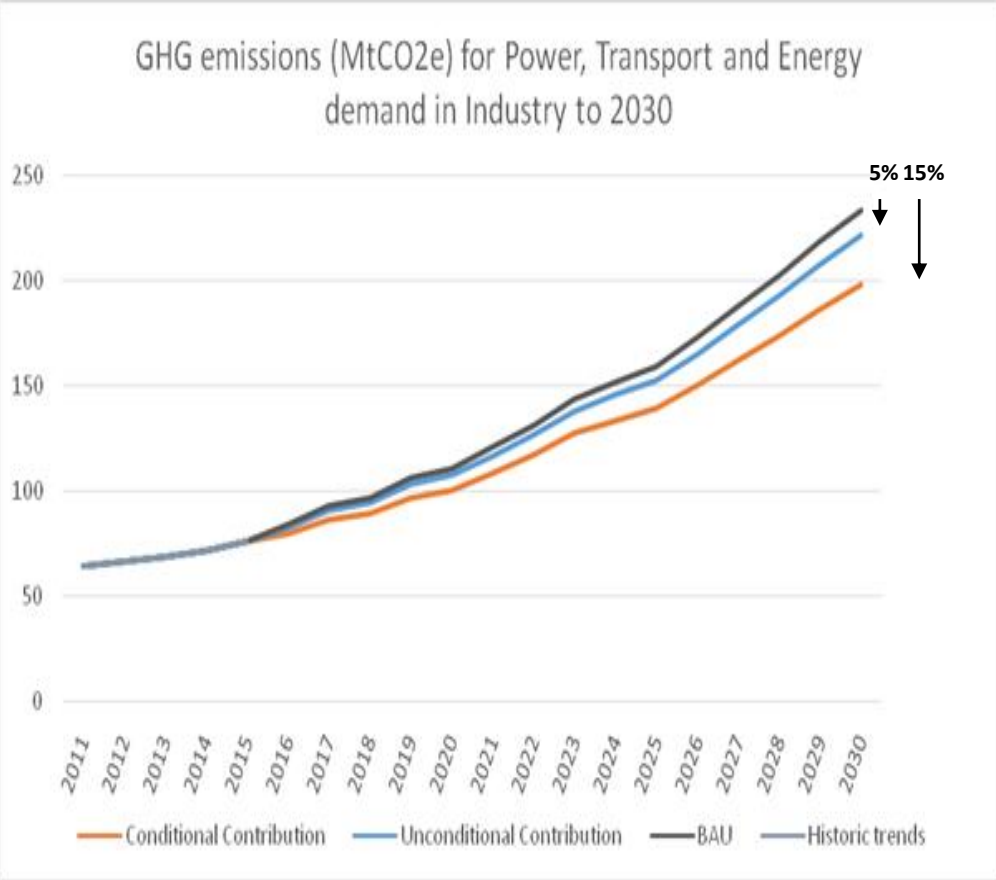
Policy Landscape of RE in Bangladesh

Guidelines for Implementation of Solar Power Development Programme 2013	Solar Park, Solar Mini Grid, Roof-top Solar System. **Two business models: Captive & IPP** **Identified IDCOL as potential lender**
7th FYP FY 2016-FY 2020	Scalable generation from solar & wind is emphasized.
Net Metering Guidelines 2018.	From 10kW up to 3MW may be exported to the grid.

Policy Landscape of RE in Bangladesh

Power System Master plan 2016 [up to 2041]	Guideline for power sector development [35(Coal) +35 (Gas) +10(RC) + 20(RE& Others)]
Bangladesh Energy Regulatory Commission Act 2003.	To establish BERC to act as regulator. Supply side EE&C .
SDG 7 aims to "ensure affordable reliable, sustainable and modern energy for all"	Three targets of SDG 7 are to (i)ensure universal access to affordable , reliable, sustainable and modern energy services, (ii) **increase substantially the share of RE in energy mix** (iii) double the rate of improvement in EE by 2030.

Nationally Determined Contributions



❖**Unconditional contribution**. GHG emissions in the power, transport, & industry sectors by 12 $MtCO_2e$ by 2030 or 5% below BAU emissions for those sectors.

❖**Conditional contribution**. GHG emissions in the power, transport, and industry sectors by 36 $MtCO_2e$ by 2030 or 15% below BAU emissions for those sectors.

International Cooperation on RE

- Member of International Renewable Energy Agency [IRENA]
- International Solar Alliance[ISA]

Institutional Architecture

SREDA
Sustainable and Renewable Energy Development Authority

Promote Renewable Energy

BERC

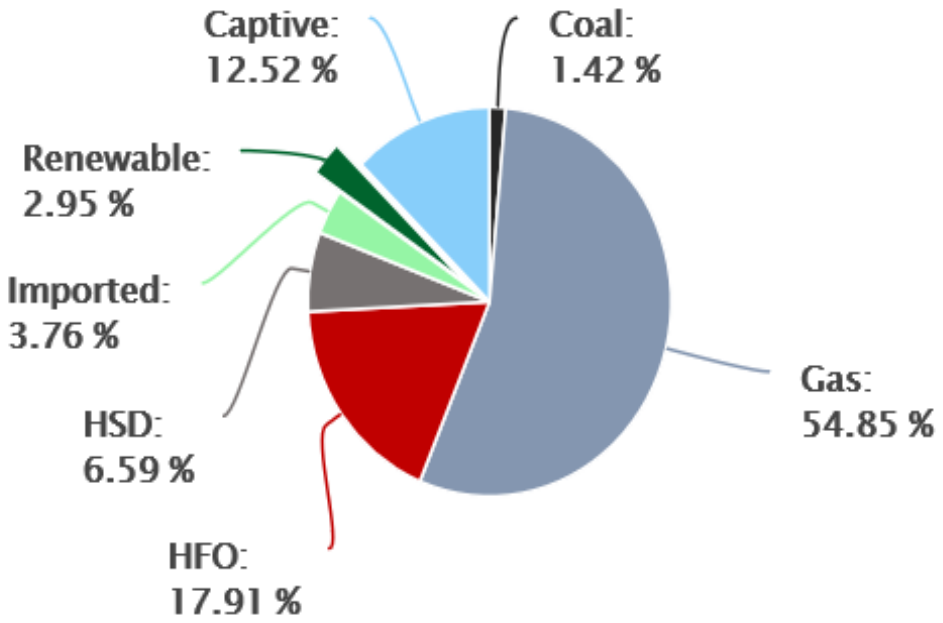
Mitigate Climate Change Issues

Adopt Energy Efficiency Measures

BSTI

Present Status of in RE in Bangladesh

Technology	Off-Grid	On-Grid	Total
Solar	267.27	17.35	284.62
Wind	2	0.90	2.90
Hydro	-	230	230
Biogas to Electricity	0.68	-	0.68
Biomass to Electricity	0.40	-	0.40
Total	270.35	248.25	518.60



Total Power Generation Capacity = 17,575.60 MW

(Including Off-Grid RE)

Renewable Energy Share = 2.95%

Source: Shttp://www.sreda.gov.bd/index.php/site accessed on 31-05-18

Incentives for RE in Bangladesh

- **Renewable electricity generators are entitled to an incentive tariff which may be 10% higher than the highest purchase price of electricity by the utility from private generators.**
- **PSPGP made provisions for payment guarantee through PPA & IA that ensure reasonable risk allocation.**
- **Payments under the PPA is ensured by Letter of Credit.**

Incentives for RE in Bangladesh

- **Payment to 'Escrow Account' ensures lenders repayment.**
- **Tariff structure consists of - capacity payment and energy payment- ensures sufficient cash flow to recover investment and return.**
- **Provisions are there in the PSPGP for making PPA & IA for RE, different from the conventional ones, to cater to specific requirements of RE.**

Incentives for RE in Bangladesh

- Private power generation **companies** are exempted from payment of **income tax** for **15** years from commencement of commercial operation.
- **Foreigners** employed in those companies are exempted from payment of income tax for **3** years since their arrival.
- Tax exemption on interest on foreign **loans**.
- Tax exemption on **Royalties**, **Technical know-how** & **Technical Assistance Fees**.
- Tax exemption on **capital gains** from **transfer** of **shares**.

Source: SRO NO.211-Law/Income-tax/2013, *the Bangladesh Gazette Extraordinary*, (July 1, 2013). (Amended vide SRO No. 254/Law/2013 dated November 18, 2013 & SRO No. 246/Law/2016 dated July 26, 2016)

Incentives for RE in Bangladesh

- **Private power companies are allowed to import plant & equipment imported on a permanent basis & erection materials, machinery and equipment on a temporary basis without payment of custom duties, VAT & supplementary duties[1].**
- **Spare parts up to 10% of the original value of total plant and equipment within 12 years of commercial operation without payment of customs duties, VAT, supplementary duties & any other surcharges.[2]**

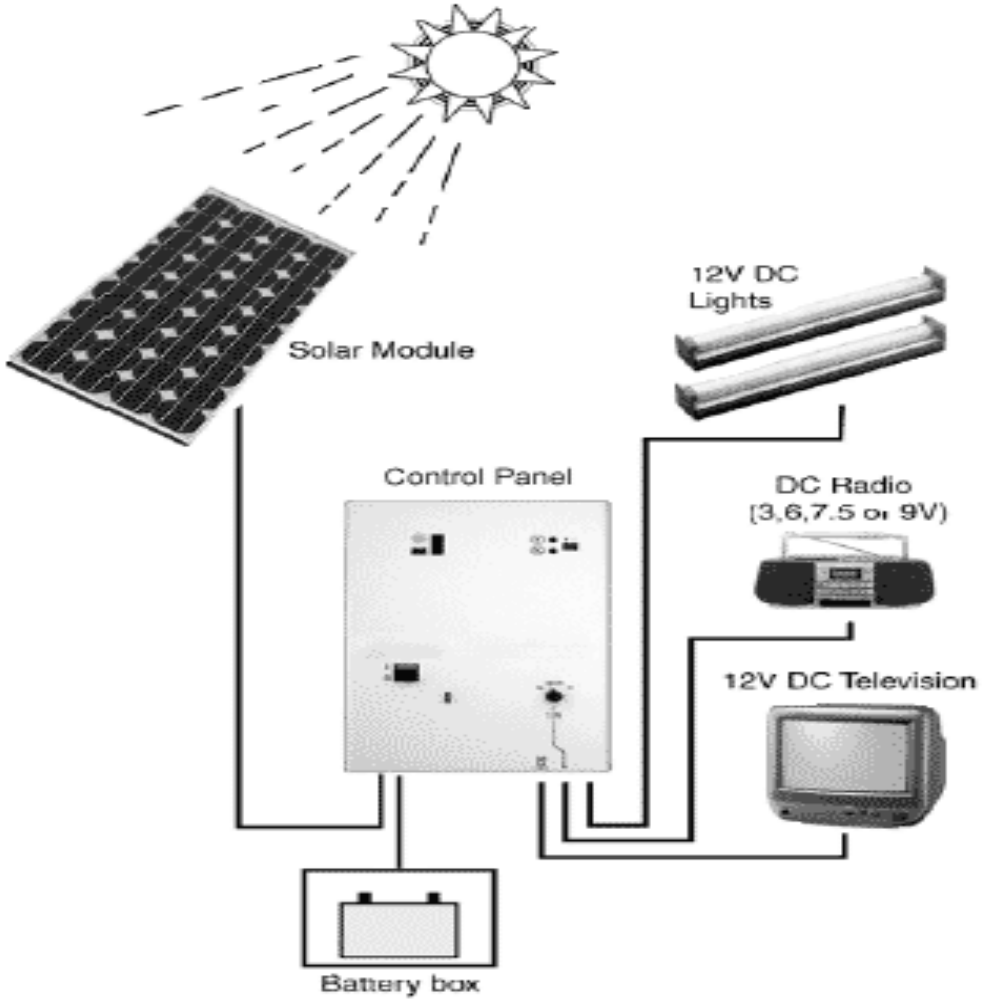
Source: [1] SRO NO.73-Law/1997/1700/Duty, Dated 19/03/1997, *the Bangladesh Gazette Extraordinary*, (March 20, 1997).
[2] SRO NO.100-Law/2000/1832/Duty, Dated 18/04/2000, *the Bangladesh Gazette Extraordinary*, (April 20, 2000).

Incentives for RE in Bangladesh

- **[1]Exemption of import tax, VAT & supplementary duties (if any) on 16 items (mentioning HS Code) of solar panel.**
- **Launching of Net Metering Guidelines 2018 is underway.**

Source: [1]SRO NO.155-Law/2004/2047/Duty, Dated 10/06/2004.

Solar Home System (SHS)



20Wp	3 W LED Lamp: 2 Mobile Charger: 1	4-5 hours
50Wp	3 W LED Lamp: 5 LED Color TV: 1 Mobile Charger: 1	4-5 hours
85Wp	3 W LED Lamp: 7 LED Color TV: 1 Mobile Charger: 1 12 W DC Table Fan: 1	4-5 hours

So far 5 million SHSs have been installed in Bangladesh providing access to electricity to 20 million people.

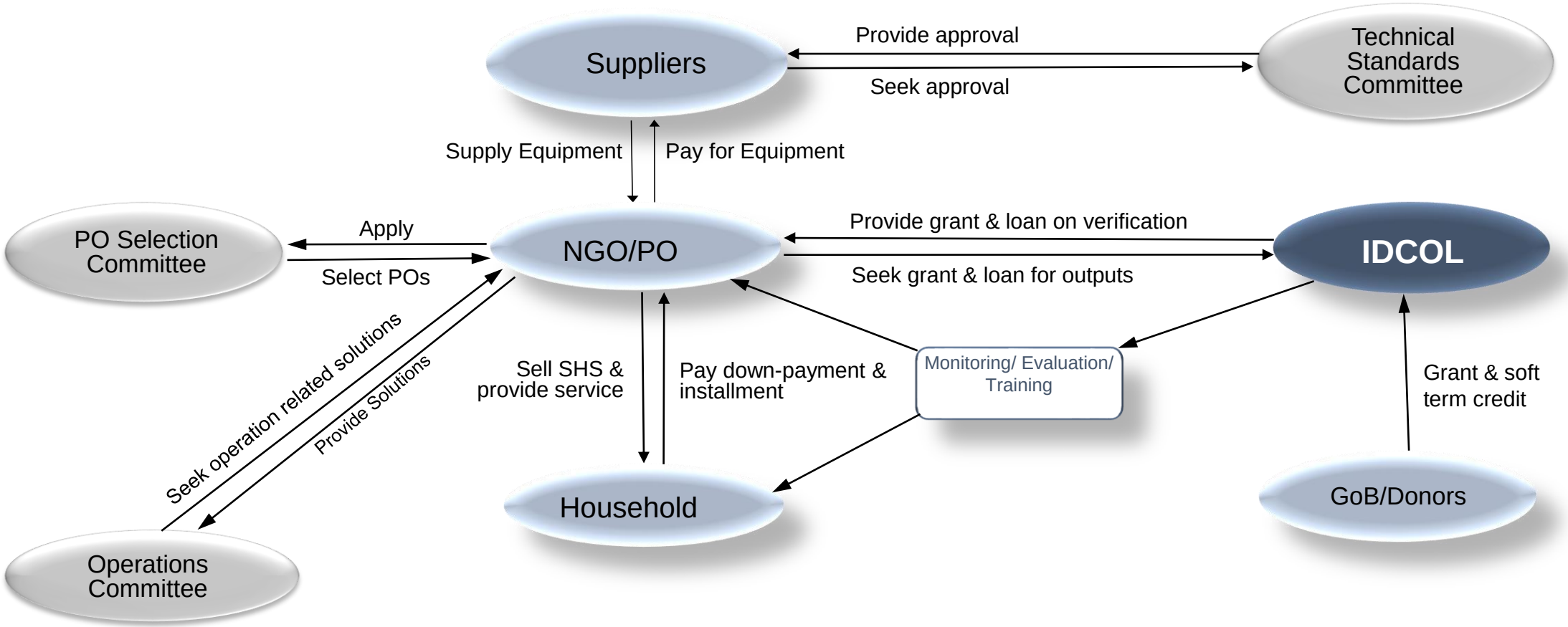
Financing SHS

(a) Market Price of 20 Wp SHS	USD 138
(b) Buy-down Grant (Grant A)	USD 20
(c) System Price for Household [(b)-(a)]	USD 118
(d) Down Payment from Household to PO [15% of (c)]	USD17.7
(e) Loan Payable from Household to PO [(c)-(d)]	USD 100.3
Loan Tenor	*3 years*
Interest Rate	*16% p.a.*
Monthly Installment Amount	*USD 4.4*
(f) IDCOL Refinance [70%~80% of (e)]	USD 70~80
Loan Tenor	*5~7 years*
Interest Rate	*6~7% p.a.*

Fund Flow and Role of Partners

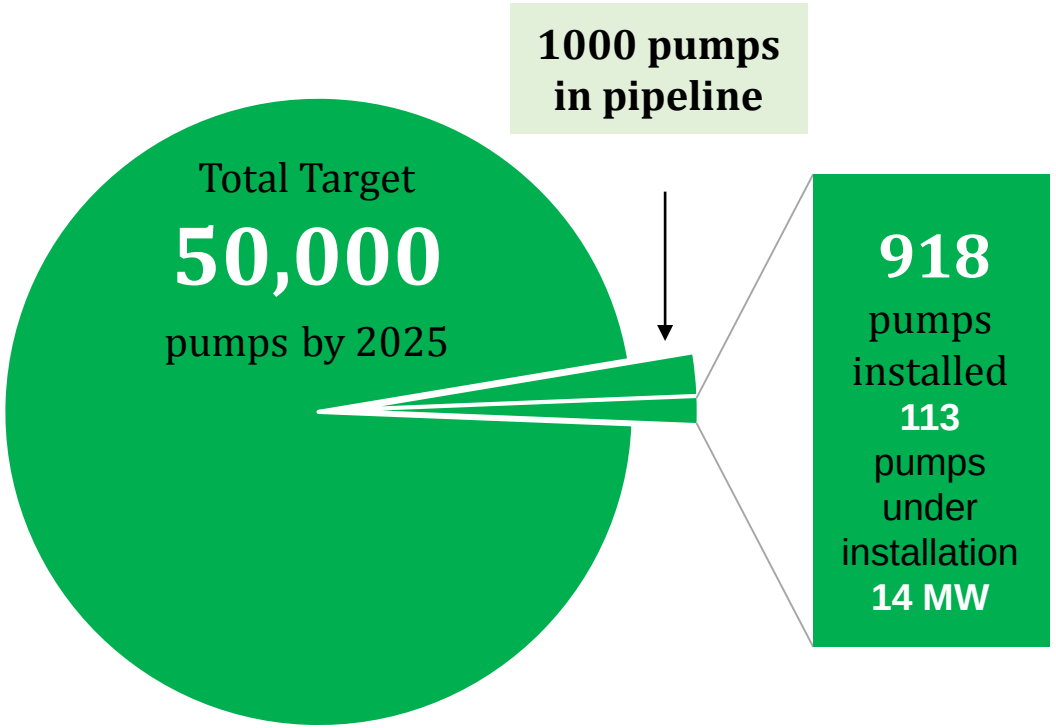
Multilateral Agencies	GoB	IDCOL	PO	Household
• Provides grant and soft loans • Provides technical assistance needed	• Provides grant and soft loan to IDCOL • Provides policy support	• Provides grants to reduce SHS cost and for capacity building • Provides soft loans • Provides training, promo support • Monitors and evaluates implementation	• Identify potential customers • Installs SHS • Extends micro-credit • Provides after sales services	• Maintain system • Repay loan in monthly installments

Result based Financing



Solar Irrigation

Solar Irrigation



Irrigation pumps run by electricity

- Total : 0.27 million pumps
- Area coverage : 1.7 million hectares
- Electricity Consumption : 1500 MW

Irrigation pumps run by diesel

- Total : 1.34 million pumps
- Area coverage : 3.4 million hectares
- Fuel Consumption : 1 million tons of diesel /year worth $ 90million
- Subsidy : USD 280 million

Source: IDCOL 2018.

Solar Irrigation

Financing structure:

Particulars	(%)
Equity	15
Debt	35
Grant	50
Total	100

Financing terms

Facility	Interest rate	Tenor	Grace	Repayment frequency	Security
Term loan	6% p.a.	10 years	24 months	29 quarterly installments	Bank guarantee/land mortgage/FDR

Source: IDCOL 2018.

Re Road Map

SL #	Program	2017	2020
1	Solar Park	3 MW	700 MW
2	Solar home system	205 MW	252 MW
3	Solar Mini-grid/micro-grid/nano-grid	2.69MW	7 MW
4	Solar irrigation	14 MW	46 MWMW
5	Roof-top [net metering]	0.360MW	600 MW
6	Roof-top solar –others [including new electricity connection]	30 MW	50 MW
7	Solar drinking water system	1.6 MW	6 MW
8	Solar powered telecom tower	8 MW	15 MW
9	Solar street light	2.3 MW	5 MW
10	Hydro	230 MW	230 MW
11	Wind	2.9 MW	30 MW
12	Biomas	0.5 MW	20 MW
13	Others [vehicle , boat, acquaculture etc.]	1 MW	10 MW
	Total	501.36 MW	1971MW

RE FOR SUSTAINABLE ENERGY FUTURE