

Energy Scenario in Bangladesh and the Role of Renewable Energy

S. M. Formanul Islam
Director, Legal and Company Secretary, IDCOL



27 April 2008

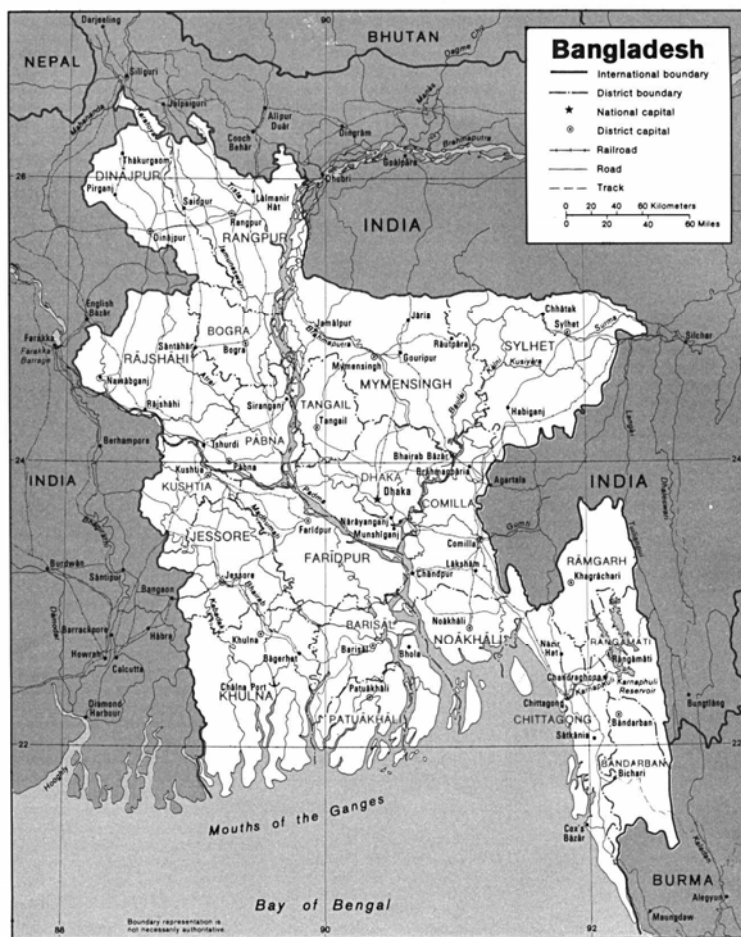


Country Profile of Bangladesh

Geographical Location	Between 20 ⁰ 34' and 26 ⁰ 38' North latitude, 88 ⁰ 01' and 92 ⁰ 41' East longitude
Area	147,570 sq. km
Land Type	Consists mostly of flat fertile alluvial land
Population (2006)	138.8 million
Population Density	941 per km ²
Number of Household (2001)	25.40 million
Average Household (2001)	4.8 persons
Per capita GDP (2003)	\$389
Per capita GDP (2006)	\$456



Map of Bangladesh





Conventional Electricity Supply and Resources

Per capita energy consumption (kgoe, 2003)

Country/Region	Energy Consumption	Country/Region	Energy Consumption
1. Bangladesh	157	5. India	520
2. Nepal	355	6. China	1094
3. Sri Lanka	422	7. World	1688
4. Pakistan	467	8. OECD	4588

- Energy consumption per capita in Bangladesh is extremely low compare to neighboring countries.
- The consumption per capita is half of even Nepal and 1/10th of the world.



Sources of Energy: Biomass Energy

Estimates of Energy Supplied by Traditional Biomass Fuels ('000 tons of coal equivalent)

Fuels	2000-01	2001-02	2002-03	2003-04
Cow-dung	2471	2471	2471	2502
Jute stick	966	1010	966	922
Rice straw	1429	1409	1418	1218
Rice hulls	2810	2854	2898	2854
Bagasse	340	366	366	392
Fire wood	1166	1219	1219	1272
Twigs and leaves	1378	1431	1484	1537
Other wastes	1230	1273	11317	1361
Total	11790	12033	12139	12258

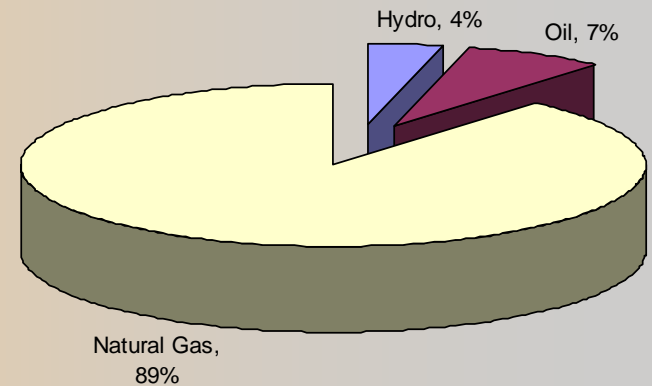
- 68% of total energy consumed comes from biomass which is used mostly for cooking in rural areas and for rural industries.
- Consumption of biomass has remained stagnant over the years and there is little chance to produce a larger amount of biomass.



Sources of Energy: Electrical Energy

Electricity Generation and Consumption in Bangladesh, 2005-2006

Item	Quantity
Installed capacity	5,275 MW
Average Demand	4,300-4,500 MW
Average generation	3,200-3,300 MW
Per capita generation	167 kWh
Per capita consumption	136 kWh



- Consumption per capita is one of the lowest on earth – around 1/18th of world average (2429 kWh).
- In 2006, maximum load shedding was about 2,000 MW.
- Average annual demand growth is 8%.



Sources of Energy: Indigenous Fossil Fuels

Production and Consumption of Natural Gas

Category/Year	2004-2005
Gas Production (10 ⁹ cft)	486.75
Consumption (10 ⁹ cft)	-
Electricity	211.02
Captive	37.87
Fertilizer	93.97
Industrial	51.68
Tea-garden	0.80
Brick field	0
Commercial	4.85
Domestic	52.49
C.N.G	3.62
Total Consumption	456.30

Fossil Fuel Reserves

Country	Gas Trillion cft	Oil Million Barrels	Coal Million tons
Bangladesh	20	5.5	2295

Coal Deposits discovered in Bangladesh

Coal Fields	Depth of Coal Seams in meter	Reserves in million tons
Jamalganj, Bogra	640-1158	1053
Barapukuria, Dinajpur	118-506	303
Khalaspir, Rangpur	257-451	147
Dighipara, Dinajpur	250	200
Phulbari, Dinajpur	152-546	572



Sources of Energy: Imported Fossil Fuels

Import of Petroleum Products and Crude Oil

Year	Crude Oil		Petroleum Products	
	Qty Thousand tons	Value Million US\$	Qty Thousand tons	Value Million US\$
2001-02	1225	220	2072	2536
2002-03	1331	289	2214	3319
2003-04	1252	314	2262	4015
2004-05	1063	364	2692	7214

- **Transport system depends almost totally on imported liquid fuels.**
- **Kerosene is used widely for lighting in villages.**
- **Use of less polluting local CNG is becoming popular.**



Sources of Energy: Renewable Energy

- **Government has a vision to make electricity available for all by 2020.**
- **Current share of Renewable Energy Technologies (RET) in electricity production is very low. Conventional hydro produces 4% of electricity.**
- **Solar and wind contribute only 0.2% at the time.**
- **Target proposed is to generate power utilizing new renewable technologies to share 5% of total electricity demand by 2010 and 10% by 2020.**
- **A draft Renewable Energy Policy has already been prepared.**



Sources of Energy: Renewable Energy (cont.)

RETs which have found wide scale use in Bangladesh are shown below:

Technology	Number of units
Solar Home System	Above 180,000
Improved biomass cooker	Around 300,000
Biogas Plants	Around 25,000

A number of organizations are involved including LGED, BUET, REB, BPDB, BRAC, GS, CMES, Rahimafrooz Ltd in development of technologies such as:

- Solar water heaters
- Solar dryers
- Solar cookers
- Water lifting wind turbine
- Wind electricity generators
- Hybrid generators
- Grid connected wind turbine
- Micro hydro generator
- LED lamps



Barriers of Greater Utilization of RETs

Information Barriers	Lack of information among the public and policy makers about renewable energy resources, technical/ economic information about RETs.
Policy Barriers	Absence of nationwide renewable energy policy, programs, and goals although a draft policy has been prepared by the Power Cell, Ministry of Energy and Mineral Resources.
Technical Barriers	Local manufacturing and/or assembly of renewable energy technology components and equipment are currently limited.
Market Barriers	The high upfront cost at the end user level for renewable energy is a major barrier.
Economic, Financial and Financing Barriers	Lack of appropriate financing mechanisms for renewable energy except for SHS.
Human Resource Barriers	Limited expertise on system design, installation, operation and maintenance of renewable energy technologies and on project development.



Major R&D Activities for RETs

Technology	Major Organizations	Remarks
Solar Photovoltaic/ Balance of system	LGED, RERC, GS, CMES, BAU, BUET, Rahimafrooz, Micro Electronics, Energy Systems	Manufacture of all the balance of system components (like Charge controller, Cable, Battery, Inverter, Converter etc.) is made locally.
Solar Water Heaters	RERC, BCSIR	Local design, fabrication and installation have been done.
Improved Stoves	BCSIR, BRAC	Number of designs have been developed at BCSIR with three basic categories-(I) without chimney (II) with chimney (III) with waste heat utilization.
Solar Cooker-Parabolic	BCSIR	BCSIR has successfully field -tested its design which can quickly raise water to boiling point under clear sunny days.
Solar Cooker-Box Type	RERC, BCSIR, BRAC, CMES	The cooker is made of locally available raw materials.
Solar Dryer	RERC, BCSIR, BRRRI, BAU	Different types have been designed and tested with locally available materials.
Solar wood Seasoning	BFRI	A simple, inexpensive and effective solar kiln has been developed.
Briquetting Machine	KUET, BRRRI	Under the "RET in Asia" program, BIT Khulna is developing better machines with longer life.
Biogas	BCSIR, LGED,BAU,BRAC,GS,IDCOL	Fixed-dome type plants are indigenously designed and constructed.





Major Promoters of Renewable Energy Technologies

- Local Government Engineering Department (LGED)
- Rural Electrification Board (REB)
- Bangladesh Power Development Board (BPDB)
- Infrastructure Development Company Ltd. (IDCOL)
- Different NGOs/ MFIs



Thank You