

The Energy Policy of Bangladesh

Energy development appears to be a major constraint for continued development of a LDC such as Bangladesh. The major stumbling block is lack in terms of capital investment since energy development programmes are highly capital intensive. Traditionally these programmes have been implemented with support from the donors and/or multilateral banks. Since independence the government has given adequate priority and about 20% of total public sector investment has been allocated for the development of energy sector. Even then the achievements made in this sector have not been able to cope with the growing demand for energy services, in terms of both quality and quantity.

In response to non-cooperation for large-scale investment in energy development by the major donors, which was fuelled by unacceptably high level of 'system loss' by the major government managed energy utility companies, the government encouraged participation of the private sector in energy development and management programme. This was highlighted in the first ever National Energy Policy (NEP), completed and gazetted in 1996 (GOB, 1996). The NEP recognized that energy plays important roles for socio-economic development of the country and energy development and management should be brought under an integrated policy framework. The NEP set a number of objectives, which are outlined below:

1. To provide energy for sustainable economic growth so that the economic development activities of different sectors are not constrained due to shortage of energy.
2. To meet the energy needs of different zones of the country and socio-economic groups.
3. To ensure optimum development of all the indigenous energy sources.
4. To ensure sustainable operation of the energy utilities.
5. To ensure rational use of total energy sources.
6. To ensure environmentally sound sustainable energy development programmes causing minimum damage to environment.
7. To encourage public and private sector participation in the development and management of the energy sector.

► Demand Scenarios

Two economic growth scenarios (Low Scenario and Reference Scenario) were considered to forecast future energy demands, as presented in Table-3. Projected demands for commercial energy and electricity up to the year 2020 under both the scenarios are also presented in Tables 4 and 5, respectively.

Table-3: Economic Growth Rates Used in the NEP

Scenario definition	Time frame					
	1990-1995	1995-2000	2000-2005	2005-2010	2010-2015	2015-2020
Low	4.44	5.25	5.24	5.24	6.65	6.65
Reference	5.0	6.0	6.7	7.2	7.5	8.0

Note: Taken from NEP (GOB, 1996). Values are expressed in per cents.

**Table-4: Projected Demand for Energy (Commercial and Electricity)
under Low Economic Growth Scenario**

	1990	1995	2000	2005	2010	2015	2020
	Commercial energy						
Population (million)	107	118	130	141	153	165	177
GNP Growth Rate (%)	4.44	5.25	5.24	5.24	5.24	6.65	6.65
Per capita GNP (\$)	190	214	242	276	317	366	424
Energy Coefficient	1.62	1.37	1.37	1.37	1.08	1.08	1.08
Energy Growth Rate (%)	7.13	7.19	7.18	7.18	7.18	7.18	7.18
Per Capita use (kgOE)	56	68	92	127	157	219	272
Total Energy (MTOE)	6	8	12	18	24	36	48
Total Energy (PJ)	256	342	512	769	1025	1537	2050
Energy Productivity (MJ/\$ GNP)	12.59	13.54	16.27	19.76	21.13	25.45	27.32
	Electricity						
Status in energy mix (%)	35	37	39	37	33	33	33
Total GWh	8207	11584	18315	26063	30994	46491	61988
Per capita kWh	77	98	141	185	203	282	351
Load factor (%)	55	57	57	57	58	59	60
Peak Load (MW)	1703	2320	3668	5220	6100	8995	11794

**Table-5: Projected Demand for Energy (Commercial and Electricity)
under Reference Economic Growth Scenario**

	1990	1995	2000	2005	2010	2015	2020
	Commercial energy						
Population (million)	107	118	130	141	153	165	177
GNP Growth Rate (%)	4.5	5.4	6.4	7.2	7.7	8.2	8.7
Per capita GNP (\$)	190	214	254	318	416	560	774
Energy Coefficient	1.62	1.37	1.37	1.37	1.08	1.08	1.08
Energy Growth Rate (%)	7.34	7.4	8.77	9.86	8.32	8.86	9.40
Per Capita use (kgOE)	56	72	94	131	194	269	384
Total Energy (MTOE)	6	8	12	19	31	46	72
Total Energy (PJ)	256	362	531	827	1314	1979	3055
Energy Intensity (MJ/\$ GNP)	13	14	16	18	20	20	21
	Electricity						
Status in energy mix (%)	35	37	39	37	33	33	33
Total GWh	8207	12280	18971	28060	39750	59858	92402
Per capita kWh	77	104	146	199	260	363	523
Load factor (%)	55	57	57	57	58	59	60
Peak Load (MW)	1703	2459	3799	5620	7823	11581	17580

►Supply Scenarios / Options

Keeping a common set of strategies two supply options (Current Option considering business-as-usual practices to continue, while the Reference Option considering few issues which are additional to the Current Option) were considered to meet the projected energy demand in the future. The salient features of the two supply options are presented below.

Current Option

The basic principle of Current Option, as presented in the NEP, was that the then existing practices of energy development programme would continue in the future. The conditions under this option were the following:

- I. Development of known indigenous natural gas will continue.
- II. Development of indigenous coal at Barapukuria will continue.
- III. Development of known oil deposits and use of natural gas liquid will continue.
- IV. Development of peat will continue.
- V. Imported oil will meet the major energy needs of liquid fuels.
- VI. Imported coal will meet part of the energy need mainly for brick industries.
- VII. Indigenous natural gas, coal, hydropower and imported petroleum fuels will be used for power generation.
- VIII. There will be no effective programme on energy conservation.
- IX. Development and management of biomass fuels will be considered without having any linkages with commercial energy development programmes.

Under this supply option the policy clearly suggested that indigenous natural gas would continue to play a dominating role in meeting the non-renewable energy needs of the country. It was mentioned that by the year 2000 the daily supply of natural gas would reach its maximum level at 1000 MMCFD and it would remain so till 2020. Similarly it was hoped that development of indigenous coal from Barapukuria mines would ensure supply of 1 million tons since the year 2000 and continue well beyond the policy time frame.

The Current Option also anticipated that the dependence on imported liquid fuel would increase, even under the Low Scenario, and the gap between supply and demand would increase significantly past 2000. In order to reduce the gap between the projected demands and indigenous supply the NEP suggested that the country would have to implement a serious exploration programme and it mentioned that without this possibility it would be very difficult to meet the huge gap from imported sources.

Reference Option

The issues additional to those in the Current Option are the following: (a) enhancement of exploration, appraisal and extraction of indigenous non-renewable energy sources; (b) implementation of effective programmes on energy conservation; and (c) integration of commercial energy and biomass fuels programme to maintain sustainable supply of biomass fuels. Specific assumptions under the option were the following:

- I. Exploration and appraisal of oil and natural gas will be continued;
- II. Development of natural gas will continue;
- III. Development of coal will be continued;
- IV. Development of oil and natural gas liquid will continue;
- V. Development of peat resources will be enhanced;
- VI. Harnessing of new-renewable sources of energy will be undertaken;
- VII. Imported oil will meet the major energy demand of liquid fuels;
- VIII. Imported coal and gas will meet a part of total energy needs;
- IX. Indigenous natural gas, coal, hydropower and imported coal, petroleum fuels and nuclear power will be used for electricity generation;
- X. Effective programme will be undertaken for conservation of commercial energy and biomass fuels;

XI. Development of biomass fuels will be considered along with the development of commercial energy sources.

It was felt that implementation of the Current Option would (a) create strain on the macroeconomy by sharp increase in energy import bill, (b) require additional fuel due to absence of energy conservation measures, and (c) cause severe environmental degradation due to neglect of problems concerning biomass fuels under energy sector development programme. Considering such issues and for achieving sustainable energy development the policy recommended to follow the Reference Option.

The NEP also allocated the then and also the projected supply of natural gas (up to 1000 MMCFD) at the following ratios:

Power generation	45~50%
Fertiliser production (for local consumption only)	25~27%
Industry	13~18%
Commercial and domestic	8~10%

Table 6 gives primary energy mix for power generation and Table 7 provides demand supply balances of current option as presented in NEP (GOB, 1996).

Table-6: primary Energy Mix for Power Generation

Type	1990	1995	2000	2005	2010	2015	2020
Total Generation	(values given in GWh)						
Low scenario	8207	11584	18315	26063	30994	46491	61998
Reference scenario	8207	12280	18971	28060	39750	59858	92402
Gas	7285	10500	15000	15000	15000	15000	15000
Coal	0	0	1030	2000	2000	2000	2000
Hydro	800	800	1000	1000	1300	1300	1300
Total generation from indigenous fuel	8085	11300	17030	18000	18300	18300	18300
Deficit*							
Low scenario	122	284	1285	8063	12694	28191	43698
Reference scenario	122	980	1941	10060	21450	41558	74102

* **To be generated by imported fuel.**

Table-7: Demand Supply Balances of Current Option

Description	Time frame						
	1990	1995	2000	2005	2010	2015	2020
Demand	PJ						
Low scenario	256.0	342.0	512.0	769.0	1025.0	1537.0	2050.0
Reference scenario	256.0	362.0	531.0	827.0	1314.0	1979.0	3055
Indigenous supply	PJ						
Natural gas	168.84	262.31	366.83	366.83	366.83	366.83	366.83
NGL & LPG	1.56	2.97	7.27	7.27	7.27	7.27	7.27
Oil	1.0	0.0	0.0	0.0	0.0	0.0	0.0
Coal	0.0	0.0	27.0	27.0	32.4	32.4	32.4
Peat	0.0	0.0	0.0	0.08	0.15	0.15	
Hydro	11.43	11.43	11.43	11.43	14.86	14.86	14.86
Sub-total	181.83	276.71	412.53	412.6	412.51	412.51	412.51
Deficit	PJ						
Low scenario	74.17	65.29	99.47	356.40	612.49	1124.49	1637.49
Reference scenario	74.17	85.29	118.47	414.40	901.49	1566.49	2642.49

Note: From NEP (GOB, 1996).