

CHAPTER – V

ENERGY

5.1 POWER

5.1.1. The approved outlay in respect of Power sector for the Tenth Plan is Rs 50137.00 lakhs. The actual expenditure during the Annual Plan 2002-2003, 2003-04 and 2004-2005 were Rs. 5580.59 lakhs, Rs. 7850.75 lakhs and Rs.9438.79 lakhs respectively. The approved outlay for 2005-2006 is Rs. 21300.00 lakhs and the proposed outlay for 2006-2007 is Rs. 24000.00 Lakhs as indicated below:-

(Rs. Lakhs)

Sl. No.	Items	Tenth Plan 2002-07 Approved Outlay	Annual Plan 2002-03 Actual Expenditure	Annual Plan 2003-04 Actual Expenditure	Annual Plan 2004-05 Actual Expenditure	Annual Plan 2005-06 Approved Outlay	Annual Plan 2005-06 Anticipated Expenditure	Annual Plan 2006-07 Proposed Outlay
1.	T & D Work :-							
	a)Shillong Improvement scheme	1200.00	-	-	-	-	-	-
	b) Distribution Master Plan	1800.00	-	83.19	317.00	162.00	162.00	-
	c) Tura Improvement Scheme	1000.00	-	-	-	-	-	-
	d) Augmentation of existing 132 KV S/S	270.00	-	-	-	-	-	-
	e) Construction of 220 KV/132 KV S/S (Byrnihat / Khliehriat, etc.)	600.00	-	-	-	-	-	-
	f) 132 KV D/C Line (Leshka-Khliehriat, etc.)	800.00	-	-	-	-	-	-
2.	Survey & Investigation	375.00	75.00	75.00	122.00	75.00	400.00	-
3.	T&D Schemes (Other State Plan Funds)	-	-	-	-	14.00	14.00	-
4.	Generation Scheme – Myntdu - Leshka HEP (REC Loan & Other Loans)	30600.00	1492.59	1069.16	4307.88	8300.00	8000.00	10700.00*
5.	Renovation&Modernisation of Umiam Stage –I	1887.00	1218.00	450.00	-	-	-	-
6.	Rural Electrification:						-	
	a) ACA for PMGY (RE)	} 3705.00	638.00	650.00	650.00	-	650.00	-
	b) R.E (PMGY – Non ACA)		1500.00	3939.62	3236.74	-	-	-
	c) Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY)		-	-	-	3000.00	3000.00	3300.00 #
7.	Transmission & Transformation Scheme (LIC Loans & Other Loans)	-	-	1199.19	-	1250.00	900.00	2500.00
8.	Accelerated Power Development & Reforms Programme (APDRP)	-	657.00	384.59	805.17	4863.00	4863.00	5500.00
9.	Renovation & Modernisation of Umiam Stage II (EAP)	7900.00	-	-	-	3636.00	1000.00	2000.00\$
	TOTAL :	50137.00	5580.59	7850.75	9438.79	21300.00	18989.00	24000.00

* Includes Rs. 6000.00 Lakhs of REC Loan and Rs. 4700.00 Lakhs of State's contribution.

Includes Rs. 300.00 Lakhs as State's share.

\$ Includes Foreign component of JBIC Assistance of Rs. 1800.00 Lakhs and Rs. 200.00 Lakhs of State's contribution.

5.1.2 GENERATION SCHEMES:

Myntdu Leshka H.E. Project (2x42 MW): The Leshka H.E. Project is located in the Jaintia Hills District of Meghalaya. The Central Electricity Authority after scrutiny of Detailed Project Report and discussion with Me.S.E.B. officials approved the cost estimate @Rs.363.08 crores and issued the techno economic clearance in September,1999. The Ministry of Environment and Forest, New Delhi issued the environment and forest clearance on 26-09-2001 vide their letter No. J-12011/4/99-1A1 dated 26-09-2001. In a meeting held in the office chamber of the Chief Secretary on the 23rd March, 2005 the funding components of the 2 x 42 MW Myntdu-Leshka HEP was as indicated below:-

Item	Amount (Rs. Crores)	Remarks
(i) R.E.C Loan	254.00	-
(ii) State Govt. Loan (HUDCO based)	60.00	An amount of Rs. 33.30 crores have already been placed with MeSEB.
(iii) State Govt. support on 90% grant & 10% Loan basis	49.00	An amount of Rs. 2.00 crores had been placed during 1999-2000. As such, arrangements will have to be made for releasing the amount of Rs. 47.00 crores, as far as possible during 2005-2007.
TOTAL	363.00*	

* *The MeSEB has recently reported that the Project Cost is likely to be revised.*

The work is progressing rapidly and the expenditure during 2003-04 and 2004-05 were Rs 1099.16 lakhs and Rs.4307.88 lakhs respectively. The outlay for the scheme during 2005-06 is Rs. 8000.00 Lakhs. The proposed outlay for 2006-07 is Rs 10700.00 lakh which includes Rs. 4700.00 Lakhs as State's share contribution and Rs. 6000.00 Lakhs of REC Loan.

5.1.2 RENOVATION & MODERNISATION (R&M) SCHEMES (EAP):

Stage II Power Station, Umsumer: With the successful completion of the R&M works of Umiam Stage I Power House (4X9 MW) under the JBIC funding, it was proposed to take up the R&M work of Umiam Stage-II Power House (2x9 MW) during 2003-04, under JBIC funding, at the estimated cost of Rs. 90.46 Crores, including Capacity Building. The SAPROF (Special Assistance for Project Formulation) study was conducted by TEPCO & Co Ltd, Japan under JBIC grant from August 20 - August 29, 2003 to ascertain the exact scope of work based on the feasibility study conducted by JCI, Tokyo during the year 1996.

Based on the above study, Loan negotiation took place between MeSEB, Govt of India & JBIC for which MOU was signed on 23.10.04. Loan agreement was signed on 31.3.04 at an estimated cost of 2343 MJY (INR Rs. 90.46 crores) between GOI & JBIC. The estimated cost is as follow:

(in Million Japanese Yen)			
Category	Loan component	Local component	Total
A. Electrical & mechanical	1347	379	2343 (Rs. 90.46 crores)
B. Consulting services (including capacity building)	415		
C. Interest during construction	67		

D. Contingencies	135		
TOTAL :	1964 (Rs. 75.83 crores)	379 (Rs. 14.63 crores)	

An amount of Rs. 3636.00 lakhs was allocated during Annual Plan, 2005-06 and the anticipated expenditure during the year is Rs. 1000.00 Lakhs. An outlay of Rs. 2000.00 lakhs is proposed during Annual Plan, 2006-07, which includes Rs. 1800.00 Lakhs as JBIC Assistance and Rs. 200.00 Lakhs as State's contribution.

5.1.3 TRANSMISSION SCHEMES:

Considering the rapid growth of load demand in the State, MeSEB is facing shortage of power in the recent time. The transmission constraint is one reason for this power shortage as MeSEB cannot draw its share of central sector power. In order to enable MeSEB drawing its Central Sector power share from the NE grid, strengthening of its existing network is becoming inevitable. In view of this, numbers of transmission schemes have been formulated and targeted to be completed on a priority basis to meet the short term demand of the State. These schemes included augmentation and construction work of 132KV / 220KV Grid sub-stations and transmission lines.

Also, the R&M of protection system which was proposed in 2005-06 will continue in 2006-07. The Electro Mechanical Relays installed at different Power Stations & Grid Sub-stations have become old and are prone to frequent breakdown. They have also outlived their utilities and have become obsolete. It has therefore become necessary to replace them by new ones. With the development of digital protection systems, it is proposed to replace them by more reliable, sensitive, fast pickup numerical (digital) relays in all the Power Stations and Grid Sub-stations. This will ensure smooth operation of the protection system. It is also proposed to include suitable testing equipments and installation of computers to record the nature of faults.

During the Annual Plan, 2005-06 an amount of Rs. 900.00 Lakhs is allocated against T&T works and it is anticipated to be utilized during the year. An amount of Rs. 2500.00 Lakhs (includes Rs.1300.00 Lakhs as LIC Loan and Rs. 1200.00 Lakhs as Other Loans) is proposed for the Annual Plan, 2006-07 for the following projects :-

Sl. No	Scheme
1.	R & M of Protection System in Power Stations and Grid Sub-Stations
2.	LILO of existing 132 KV D/C line Stage-IV Sarusajai at UPS
3.	Construction of 2nd Circuit 132 kV line Stage III to Stage IV
4.	Construction of 132 KV S/S at Umiam (2 X 20 MVA)
5.	R&M of 132 KV Mawlai - Sumer line
6.	EPIP - II S/S (1 X 50 MVA)
7.	Construction of 132 KV S/S at Mendipather (1 X 50 MVA)
8.	132 KV D/C line from EPIP-I to 220 KV S/S at Kylling, Byrnihat
9.	132 KV D/C line from EPIP – II to 220 KV S/S at Kylling , Byrnihat
10.	Installation of capacitor bank at EPIP-I and Umtru P/S.

5.1.4 RURAL ELECTRIFICATION:

The proposed outlay for Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) Scheme during 2006-07 is Rs 3300.00 lakh (including Rs. 300.00 Lakh as State's share), which will cover electrification of about 250 villages.

The Rural Electrification works of Meghalaya for the year 2006-07 will be taken up through Rajiv Gandhi Grameen Viduytikaran Yojana (RGGVY) Scheme. The Ministry of Power, Government of India vide notification No.44/19/2004-D/RE dated 18.3.2005 has launched this programme. This is a 90% subsidy and 10% loan scheme. The Rural Electrification Corporation (REC) New Delhi, is the nodal agency and the required fund will be routed through the REC. The works will be required to be executed district wise through turnkey contract basis. A tripartite agreement amongst Government of Meghalaya, MeSEB and REC has been signed on 24.08.2005 in New Delhi.

The aim of the RGGVY scheme is to provide access to electricity to all rural households in five years. The scope of works of the scheme is as follows :

1. Rural Electricity Distribution Backbone (REDB) – Provision of 33 / 11 KV (or 66/11KV) Sub stations of adequate capacity and lines in blocks where these do not exist.
2. Creation of Village Electrification Infrastructure (VEI)
 - Electrification of un-electrified habitations.
 - Provisions of distribution transformers of appropriate capacity in electrified villages / habitations.
3. Decentralized Distribution Generation and Supply.
4. Rural household electrification of BPL households
5. Franchises
6. Revenue Sustainability

The Detailed Project Report (DPR) of the scheme district-wise (East Khasi, West Khasi, Jaintia, Ri Bhoi, East Garo, West Garo, South Garo Hills) is under preparation. The DPRs will be sent to the REC New Delhi, for approval and sanction. Notice inviting tender (NIT) for the works will be issued after sanctioned of the scheme.

5.1.5 ACCELERATED POWER DEVELOPMENT & REFORMS PROGRAMME (APDRP):

The expenditure incurred under APDRP during 2003-04 was Rs. 384.59 lakhs and in 2004-05 was Rs 805.17 lakhs. An amount of Rs. 5500.00 Lakhs is proposed for the Annual Plan, 2006-07.

Meghalaya State Electricity Board has initiated the process of implementing power sector reform to provide commercial viability and quality power in the State of Meghalaya by implementing energy audit and reducing T & D losses in the Sub-transmission & Distribution System. One such scheme is the 100 % metering in the state under APDRP, of which Rs.1.81 crore has been sanctioned on 16.3.2001 by the Govt. of India for provision of metering at all EHV & HV feeders. The work has been completed in November 2004 at a total cost of Rs 1.91 crore.

Further, to improve the commercial viability of MeSEB, the schemes under APDRP have been approved as follows:

Sl. No.	Name of Scheme	Sanction Amount	Remarks
1.	System metering	Rs 1.81 Crore	Scheme completed
2.	Shillong Circle	Rs. 16.53Crore	Schemes are in various stages of implementation.
3.	Tura Circle	Rs. 7.11 Crore	
4.	Jowai Circle	Rs. 2.65 Crore	

5.	Western Circle (Byrnihat)	Rs. 15.97 Crore	
6.	Central Circle	Rs. 62.51 Crore	
7.	Garo Hills Circle	Rs. 38.02 Crore	
8.	Jaintia Hill Circle	Rs. 51.62 Crore	
9.	SCADA (Shillong)	Rs. 21.12 Crore	
10.	SCADA (Byrnihat)	Rs. 17.99 Crore	
	Total	Rs 235.33 Crore	

All the above schemes are in various stages of implementation.

5.2. NON CONVENTIONAL SOURCES OF ENERGY

5.2.1. The approved Tenth Plan outlay is Rs. 440.00 Lakhs and the cumulative expenditure during the 1st three years of the Plan period is Rs 160.44 lakhs. The approved outlay for 2005-06 is Rs.89.00 lakhs, which is expected to be utilized in full. The proposed outlay for 2006-07 is Rs. 100.00 lakhs.

5.2.2. Energy crisis caused by dwindling resources of fossil fuels has compelled us to find a safe and environmentally benign alternative source of energy. The alternative new sources of energy especially Solar, Hydro, Wind and Bio-Energy sources have already demonstrated that it can fit the bill though it may be a small fraction of our total energy requirement. The potential of these schemes will grow as the technologies improved.

5.2.3. The main thrust proposed for 2006-2007 is to complete the ongoing programmes and restructuring the scheme on the basis of end use application of technologies and reduction of subsidy in a phased manner which are broadly classified as follows: -

A. Power Generation :

- i) Small Hydro Power
- ii) Solar Photovoltaics
 - (a) Solar Home Lighting System
 - (b) Solar Power Plant
- iii) Biomass Gasification

B. Cooking & Heating : Through Biogas Plant of family size type or through community type making use of the technology of conversion of energy from waste. An amount of Rs. 16.00 lakhs is earmarked for the annual plan 2006-2007.

C. Solar Photovoltaic : Solar Photovoltaic Cell has been found to be efficient especially due to the moderate temperature conditions prevailing in the State. Photovoltaic are an economical electricity source for the dispersed villages in the State and may become more economical when compared to the grid power. An amount of Rs.28.00 lakhs is proposed for 2006-2007 for procurement and distribution of 400 Nos of Solar lantern and 500 Nos of Solar Domestic Lighting System and also to demonstrate the use of Solar Photovoltaic in Urban areas as per provision of the Govt. of India.

D. Micro Hydel & Water Mill Projects: The rising cost of grid electrically have created a growing interest in micro hydel technology as an efficient low cost alternative in the State especially in remote isolated placed of difficult accessibility of this hill state. It is also simple where ordinary people will be able to manage and control. It has an added advantage of short gestation period. No submergence or deforestation problems, reduced transmission losses and the scheme are environmentally more benign. During the year 2005-2006 water mill are proposed to start with for village electrification or captive power generation or for grinding purposes. A sum of Rs. 20.00 lakhs is proposed for the year 2006-2007.

The break-up of the outlay of Rs..100.00 Lakhs proposed for the Annual plan 2006 - 2007 is given below:

i)	Direction & Administration	-	Rs. 36.00 Lakhs
ii)	Micro Hydel/ Water Mill Project	-	Rs. 20.00 Lakh
iii)	Solar Photovoltaic	-	Rs. 28.00 Lakhs
iv)	National Programme for Bio-gas Devt.	-	Rs. 16.00 Lakhs
TOTAL			- Rs.100.00 Lakhs

5.3. INTEGRATED RURAL ENERGY PROGRAMME (IREP)

5.3.1. The scope of Integrated Rural Energy Programme is to improve the availability of commercial sources and application of Non-Conventional Sources in the rural areas of the State. The principle of adopting area based rural energy plan with C.D. Block as unit, which has already been accepted by the State Government is the main thrust of the programme. The total approved outlay for this sector for the Tenth Plan is Rs. 550.00 Lakhs and the actual expenditure during the Annual Plan 2002-03, 2003-04 and 2004-05 are Rs.61.50 Lakhs, Rs. 54.52 lakhs and Rs 42.42 Lakhs respectively. The approved outlay for 2005-06 is Rs. 89.00 lakhs which is expected to be utilized in full. An amount of Rs.100.00 lakhs is proposed for 2006-2007.

5.3.2. The main thrust of the programme as indicated earlier has been to meet the energy needs of the people taking C.D. Blocks as unit. This requires and investment of very tall order which is not being made available, considering the difficult financial position of the State resources, as this has to cater both as means to satisfy basic human needs and also as an input to economic transformation. For example, energy is required not only to meet the increasing demand created by promotion activities to support ongoing agricultural diversification and intensification, but also to meet the energy needs of poor people especially their requirements of cooking, lighting and space heating.

The objectives of Rural Energy programme is therefore proposed to be classified broadly in two groups:

i) ENERGY SERVICE FOR SUBSTANCE :

The minimum level of energy that is to be ensured to meet the basic needs of the Rural people i.e. lighting, cooking and space heating (wherever necessary)

ii) ENERGY SERVICE FOR GROWTH :

The energy that is to be made available to support development only if energy system is transformed. This transformation shall generate employment opportunities by being linked appropriately with income generating activities. The strategy of tackling energy crisis under IREP shall be through the following :

- (a) Promotional of New/Non Conventional Energy Source of Energy.
- (b) Reduction in consumption of Hydro Carbons.
- (c) Reduction in consumption of firewood.
- (d) Energy Conservation measures

5.3.3. PROGRAMME PARAMETERS :

The programme parameters shall consist broadly of the following :-

i) **Development of institutional mechanism.**

Though these comprises mainly the Central component, yet the State has to provide for additional staff engaged in the Scheme along with other incidental and consequential expense, viz, office expenses, travelling allowance etc. A sum of Rs. 145.00 lakhs is proposed for the same during the 10th Plan and Rs. 45.00 lakhs for 2006-2007.

ii) **Regional Institute of Rural Energy Planning and Development.**

A sum of Rs. 30.00 lakhs was earmarked for running and maintenance of this Institute in the 10th Plan. As the sharing pattern for running and maintenance cost of this Institute between Central and State has to be arrived at. Therefore no proposal is being made in the year 2006-2007. However, presently to utilise the already existing infrastructure, the Agency shall conduct Training in the campus in the year 2006-2007 as the Central Govt. shall provides 100% reimbursement for the training undertaken.

iii) **Solar Thermal :**

This Scheme mainly aims to accelerate the economic development of the farmers in rural areas by providing water pumping to the farmers for increasing their Agricultural products and also for saving of Energy (Electricity) in Urban and Semi-Urban areas by providing Solar Water Heating System, Solar drier also is to be introduced during 2006-2007 to dry the Agriculture products. An amount of Rs. 5.00 lakhs is earmarked towards the same.

iv) **Biomass Gasification :**

An amount of Rs. 10.00 lakhs is proposed for 2006-2007 for implementation of Gasifier. This is mainly for electrification of remote villages.

v) **Field Projects :**

The energy gap mainly of cooking, lighting and agricultural needs that will be required to be met and as it will emerge from energy survey of the blocks shall be through various strategies indicated earlier. A sum of Rs. 200.00 lakhs have been proposed for the 10th Plan period and Rs. 40.00 lakhs for the year 2006-2007.

5.3.4. . The break-up of the amount of Rs.100.00 lakhs proposed for 2006-2007 is as indicated below :-

(Rs. Lakhs)					
Sl. No.	Items	Amount proposed for Tenth Plan	Amount approved for 2004-05	Amount approved for 2005-06	Amount proposed for 2006-07
1.	Direction and Administration	145.00	36.00	34.00	45.00
2.	Regional Institute of Rural Energy Planning & Development	30.00	-	-	-
3.	Solar Thermal	100.00	14.00	5.00	5.00
4.	Biomass Gasification	75.00	19.00	10.00	10.00
5.	Field Projects	200.00	14.00	40.00	40.00
	TOTAL	550.00	83.00	89.00	100.00

5.4. VILLAGE ELECTRIFICATION (MNES SPECIAL SCHEME)

5.4.1. An amount of Rs. 500.00 lakhs is provided as State's share during the Tenth Plan. The actual expenditure during Annual Plan, 2002-03 is Nil and for 2003 - 04 and 2004-2005 is Rs 25.00 lakhs and Rs.28.00lakhs as State share. The approved outlay for Annual Plan, 2005-06 is Rs. 28.00 Lakhs and the amount proposed for 2005-2006 is Rs. 30.00 lakhs which is anticipated to be utilised in full. The proposed outlay for 2006-2007 is Rs. 35.00 lakhs.

5.4.2. As projected by Rural Electrification Corporation (REC) there are about 18,000 villages in the country which are located in the remote and difficult areas which are required to be electrified by using Non-Conventional sources of Energy through Mini / Micro Power Plant, Solar Plant, Biomass Gasifier, Tidal Power Plant, Wind Power Plant, etc. It is proposed by MNES, Govt. of India that cent percent electrification of these 18,000 villages should be targeted for electrification by 2012. In Meghalaya, the total number of such remote villages in far flung areas which cannot be covered by conventional grid extension is projected at 2190 villages. However, these villages in Meghalaya also cover those villages which can be electrified by MeSEB. Meghalaya Non-Conventional and Rural Energy proposes that 1290 villages will be electrified by use of non-conventional methods and