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GOVERNMENT OF MEGHALAYA

FINAL DRAFT

POWER POLICY

CHAPTER – I

ABOUT MEGHALAYA

Meghalaya, "the abode of clouds", became a full-fledged State on January 21, 1972. It is bounded on the north and on the east by the state of Assam. On the south and west is Bangladesh. Meghalaya lies between 20° 1' N and 26° 5'N latitude and 85° 49'E and 92°52'E longitude.

The total area of the State is 22,429 square Kilometres with a population of 23,18,822 (2001 census). The population density per square kilometre is 103. They are predominantly inhabited by the tribal communities namely the Khasis, the Jaintias and the Garos, who are the descendants of very ancient people having distinctive traits and ethnic origins. The principal languages in Meghalaya are Khasi and Garo with English as the official language of the State. Khasi and Garo languages and literature have developed mainly because of the initiative of the Christian Missionaries. The State has a unicameral legislature.

The State is now divided into seven administrative districts. The district-wise population break-up is as follows:

Sl. No.	District and date of establishment	Headquarters	Area (Sq. Km)	Population
1.	East Khasi Hills(old district)	Shillong	2820	6,60,923
2.	Ri Bhoi (4.6.1992)	Nongpoh	2376	1,92,790
3	WestKhasi Hills(28.10.1973)	Nongstoin	5247	2,96,049
4.	East Garo Hills(22.10.1976)	Willamnagar	2603	2,50,582
5.	West Garo Hills(old district)	Tura	3715	5,18,390
6.	South Garo Hills(18.6.1992)	Baghmara	1849	1,00,980
7.	Jaintia Hills( 22.2.1972)	Jowai	3819	2,99,108
			<b>22,429</b>	<b>23,18,822</b>

The Khasi Hills and Jaintia Hills which form the central and eastern part of Meghalaya is an imposing plateau with rolling grassland, hills and river valleys. The southern face of the plateau is marked by deep gorges and abrupt slopes. Waterfalls rush down steep slopes and carve deep valleys through which swift-flowing rivers descend to the plains. At the foot of these slopes, a narrow strip of plain land runs along the international border with Bangladesh.

The northern section of the plateau has an undulating topography with a series of hills rising to almost the same height, extending northward to slope gradually, merging with the plains of Assam. The accordant summit of these hills varies from 170m to 820m. Nongpoh village lying half way on the Guwahati-Shillong Road stands on a flat top of 70m high on this hill section.

The height of the central plateau of the Khasi Hills hovers around 1500m with the Shillong Peak (1965m), the highest point in the plateau, overlooking Shillong Town. The Garo Hills which form the western part of Meghalaya are lower in elevation. The greater part of the Garo Hills range in height from 450m to 600m and drop steeply to the Brahmaputra valley on the north and to the plains of Bangladesh on the south. Nokrek Peak (1412m), east of Tura Town, is the highest peak in western Meghalaya.

A number of rivers, none of them navigable, drain this mountainous State. In the Garo Hills, the Manda, the Damring and the Janjiram, flow towards the north while the Ringge



and the Ganol flow in the westerly direction. Those that flow to the south are the Simsang, which is the biggest river in Garo Hills, and the Bhogai.

In the Khasi and Jaintia Hills, the rivers that flow in a northerly direction include the Khri, the Umtrew, the Umiam, the Umkhen besides the Kopli on the border between Jaintia -Hills and North Cachar Hills. The Kynshi, the Umiam Mawphlang and the Umngot flow to the south into Bangladesh.

The state of Meghalaya is directly influenced by the south west monsoon and the north-east winter winds. The four seasons of Meghalaya are: Spring - March and April, Summer (Monsoon) - May to September, Autumn - October and November and Winter - December to February. During March and April, the atmosphere gradually warms up with the advent of Spring. From the middle of April the temperature starts rising to the maximum in the month of June and then decreases gradually. This period may be termed as the Summer (Monsoon) season. The maximum temperature recorded is 34° Celsius at Tura in West Garo Hills District and 28° Celsius at Shillong.

October and November are the two months when the climate is cool and temperate. After November, the winter season sets in and continues up to the end of February, During these months the temperature comes down to as low as 2° Celsius in the Khasi Hills. Rainfall starts by the, third week of May and continues right up to the end of September and sometimes well into the middle of October. The maximum rainfall occurs over the southern slopes of the Khasi Hills, i.e., over Cherrapunjee and Mawsynram platform, which receive the heaviest rainfall the World. The average annual rainfall in the State is 12,000 mm.

Meghalaya's capital, Shillong and also the district headquarters of East Khasi Hills District is situated at an altitude of 1,496 meters above sea level. The capital city has a bracing climate throughout the year. This city has been the seat of the Government since the consolidation of the British administration in this part of India, over a century ago.

According to legends, Shillong derived its name from a deity named "Shyllong" whose dwelling is also known as Shyllong peak from whose niece the Syiem clan of Khyrim, Mylliem, Maharam, Malaisohmat, Bhowal and Langrin sprang up.

The city is one of the few hill stations with motorable -roads all around. Shillong has its own charm, different from other hill stations, and presents a natural scenic beauty with waterfalls, brooks, pine-groves and gardens. The place, the people, the flora and fauna and the climate all combine to make Shillong an ideal holiday resort throughout the year. Shillong offers arrangements for tourists with good hotel accommodation, facilities for sports, fishing and hiking.

Shillong is connected by a good arterial road with the rest of the country through Assam. A good road connects Shillong with Sylhet in Bangladesh. It is also connected with other important towns of the state like Jowai and Tura. An airport at Umroi, about 30 Kilometres from Shillong, connects Shillong by air with the rest of the country. Shillong is also the headquarters of the North Eastern Council, the Eastern Air Command, the Assam Rifles, the Assam Regimental Centre and 101 Command Zone. A bench of the Guwahati High Court has been set up in Shillong.

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## CHAPTER – II

### POWER SCENARIO IN THE STATE - THEN

1. The first power project in Meghalaya is a mini- hydel project in the northern part of Shillong established in 1925 with an installation capacity of 3x125 KVA T.G. sets utilizing the drop of the wah Umkhrah at Beadon falls. Subsequently, this power station at Sonapani was enlarged in stages with 3 (three) more sets of different capacities adding 1600KVA to the installed capacity. This privately own hydro-electric power station catered to the need of Shillong city since 1925 and was in operation until April, 1982.
2. The first small hydro-electric project in the North-East, the Umtru H. E. Project with 8.4 MW was constructed near Byrnihat in 1953 and was commissioned in July, 1957. Umiam Stage-I, Stage-II, Umiam-Umtru Stage-III (Kyrdekmlai) and Umiam-Umtru Stage-IV were also commissioned in Meghalaya. Until the commissioning of the Loktak H.E. Project in Manipur and Kopili H.E. Project in Assam, the state of Meghalaya pioneered the development of water power generation.
3. Prior to commissioning of the Umiam H.E. Project Stage-I in 1965 the electric power supply needs of Shillong were met from small hydro mentioned above and diesel power stations of capacity 1500 KW and 800 KW respectively. The diesel sets have since been disposed off and the small hydro sets have spent their life.
4. The electric energy generated by Meghalaya during the year 1975 was 176MU and 70% of that was supplied to Assam at a very nominal rate as envisaged in the terms of agreement during bifurcation. At that point of time, only Shillong, the capital city and few places like Sumer, Byrnihat and other towns / villages numbering only 261 enjoyed electricity. As a matter of fact, the consumers of the whole state numbered just 7400, while the rest of the population depended on fossil fuel and some diesel power generation for cooking, heating and even lighting.
5. The responsibility for power supply in the area of the present day State of Meghalaya was under Assam State Electricity Board (ASEB) and after bifurcation in 1975, the Meghalaya State Electricity Board (MeSEB) came into existence on 21<sup>st</sup> January, 1975.
6. During the bifurcation, Meghalaya inherited 5 (five) power stations including one which was under construction. The names of the power stations, capacity and the year of commissioning are indicated below:

Sonapani Mini Hydro Plant	1.305 MW	-	1925
Umtru Power Station	11.20 MW	-	1957
Umiam Stage-I Power Station	36.00 MW	-	1965
Umiam Stage-II Power Station	18.00 MW	-	1970
Nangalbibra Thermal Power Station	5.00 MW	-	1975
Umiam-Umtru Stage-III P/S	60.00 MW	-	(under construction)

7. Since 1975, much has happened. The 5 MW thermal power which is to serve as a base load station at Nangalbibra in Garo Hills was abandoned in 1981 due to uneconomic operation. The State's own generation can no longer cope up with the growing demand inside the State. The inter-state transmission network is inadequate to enable the state to meet its own internal demand, even though, the Central power share is available in the NE grid. The position of state owned generation is thus as follows:-

Umtru Power Station	11.20 MW	-	1957
Umiam Stage-I Power Station	36.00 MW	-	1965
Umiam Stage-II Power Station	18.00 MW	-	1970
Umiam-Umtru Stage-III P/S	60.00 MW	-	1979
Umiam-Umtru Stage-IV P/S	60.00 MW	-	1992
Myndtu-Leshka H. E. Project	84.00 MW	-	(under construction)

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## CHAPTER – III

### **PRESENT POWER SITUATION IN MEGHALAYA**

1. At present, Meghalaya is having only hydro generation. During non-monsoon period, availability of power becomes low and even the restricted load demand of the State has to be met through import of power from the NE grid. This is mainly due to the new liberalized industrial policy of Meghalaya that has triggered an unprecedented load growth in the industrial sector of Meghalaya, coupled with identical growth in other sectors due to accelerated power development and reform process.
2. The Me.S.E.B.'s own Hydel power generation capacity is only 185.2 MW and central power share is approximately 132 MW. This capacity is unable to cater the present requirement of power and increase in demand. Moreover, the average annual energy generation from State own Power Stations are around 450 MU only. The energy availability, in all probabilities shall remain at 450 MU for years to come till commissioning of the 84 MW, Myntdu Leshka Hydro Electric Project of 2 x 42 MW capacity in 2007-08.
3. With the phenomenal increase in power demand owing to growth of industries the unrestricted peak load demand for the year 2007-08 is projected at 610 MW.
4. It is expected that with the present trend of increase in peak load, the anticipated unrestricted peak demand of Meghalaya at the end of 11<sup>th</sup> Plan, would be of the order of 800 MW.
5. To meet the demand, Meghalaya has to import power but this too has a limitation due to transmission and transformation constraints, where MeSEB can draw only 120-140 MW and 60-80 MW during off peak and peak hours respectively.
6. It would still be difficult to cope with the actual peak load demand of the State even with the commissioning of 84 MW in 2007-08 and another 40 MW of New Umtru by 2009-10. Therefore, to meet this critical situation, Meghalaya has to explore an immediate remedy in capacity addition and improvement of inter state transmission networks.
7. The existing transmission network such as the 132 KV Guwahati line - I & II also need immediate renovation and changing of conductors. A transmission network master plan which is urgently required is being prepared for the state, so that power evacuation from the various potential sites could be put in place. This would also serve as a mean for easy drawal of power by industrial consumers of different districts under open access as envisaged in the IE Act, 2003.
8. To meet the immediate shortage of power and to protect the State from probable collapse of power supply due to failure of monsoon, it is of utmost importance to immediately develop thermal power stations in the State. In Meghalaya there is not a single thermal power station and hence the prescribed thermal - hydro mix is

not available at all. This over-dependence on nature is a very critical and dangerous position in view of vagaries of monsoon and in the event of drought in this part of the region. A thermal project of suitable capacity to provide base load is necessary. This would also provide an ideal thermal - hydro mix at 60 : 40 ratio which will provide better stability and security in the power system of Meghalaya throughout the year.

9. Side by side, the development of hydro power in the State shall take place at a pace to meet the need as per the power surveys and every district of the state shall have a H.E. plant for their overall development.
10. The development of mini, micro and small hydel projects have not taken off appreciably and therefore the State of Meghalaya shall take up the task of developing the enormous potential of the mini, micro and small hydel project to produce and supplement cheap, reliable, unpolluted and non-wasting source of electric energy of the state to supply power to the isolated and remote areas of the State.
11. Although 100% System metering was completed in November 2004, Energy auditing is still in its infancy stage due to lack of infrastructure for a fully computerized system of auditing and also due to lack of DT metering, absence of proper consumer indexing, and inadequate consumer metering and billing.
12. The reforms and restructuring of the State Electricity Board is likely to be completed shortly.
13. Due to the liberalized Industrial policy of the Government, the growth in the industrial sector is expected to grow exponentially. Thus exponential growth in generation capacity addition appears to be the need of the day. The growth in the domestic /commercial front is still manageable even till the end of the 11<sup>th</sup> Plan and further.
14. Few industries have installed their own captive generating plant and as per IE Act 2003.
15. The trend in the increase of power demand in the State is at Appendix I, the list of projects where survey are being undertaken under the Plan Period is at appendix II and the list of projects expected to be commissioned under the different plans period is at Appendix III and IV.

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## CHAPTER – IV

### **POWER POLICY OBJECTIVE**

Power is a critical infrastructure for the socio-economic development. Efforts at accelerating the rate of economic growth in the new globalize economy dependent on the availability of adequate, reliable and quality power at competitive rates. Therefore, the basic responsibility of the “Electricity Industry” is to provide adequate power at economical cost, while ensuring reliable and quality supply.

Development of power industry is essential for the sustainable development of the country. The Govt. of Meghalaya is committed to this onerous task and is doing its best to develop the hydro power potential and the thermal power potential in a phase manner in synchronization with the requirement.

Exploitation of the hydro, thermal and non-conventional potential can make Meghalaya State one of the prosperous States in the country. Growth in the Electricity Industry in the State will provide adequate, reliable and quality power at competitive rates to the consumers of the State to match with the new globalize economy. The revenue from trading and royalty would provide necessary inputs for other developments in the State.

It is an undisputable fact that there exist an immediate need for a thermal power plant to provide the much needed base-load power which will tide over the present power deficit situation in the State. The problems associated with inter and intra State transmission network needs to be addressed simultaneously.

Recognizing the environment pursuant to the enactment of Electricity Act 2003, the Government of Meghalaya is committed to reform its power sector and encourage private investment in generation, transmission and distribution taking into consideration the constraints on budgetary resources.

#### **The salient features of the state Power Policy are enumerated below:**

1. To make available reliable and quality power on demand at affordable rates, while ensuring that the State could support the same through its power policies.
2. To immediately develop thermal power generation in the State for meeting the immediate requirement and also to provide the much needed thermal – hydro mix.
3. To immediately improve the Extra High Voltage (EHV) connectivity of the State with the NE region for improving the present situation of drawal and evacuation of power.
4. To achieve a continuous and steady development of power projects as per requirement of the State, a four pronged strategy has been adopted by way of participation of State, Joint, Central and Private Sectors. This participation shall be through open bidding and least cost of power generation shall be the decisive criteria.

5. To attract private investment in power sector by laying down investor friendly incentives, in view of the constraints of limited financial resources available with the State Government.
6. To make power sector a major source of revenue for the State by way of allotting the projects on Build, Own, Operate & Transfer (BOOT) and thereafter the projects will revert back to the State Govt. free of cost. Royalty shall be charged in the shape of free power during that period.
7. To generate and ensure employment opportunities to bonafide Meghalayans even if power projects are handed over to Independent Power Producers (IPP), which includes Central, State agencies as well.
8. An opportunity for **Self identified projects** by IPP, apart from those projects which have already been identified by Government sector/organisations, may be given on their own and also to prepare PFR/ DPR on the same. Such IPP's may submit an application/ suo moto proposal to the Government, after which Govt. may allot such projects after due consideration and the IPP shall be asked to sign an MOA with Govt. for development of such projects. The State Government shall develop a Model MOA and implementation agreement accordingly. Such MOA shall be similar to other MOA projects, but additional time shall be given to the IPP to enable preparation of DPR for a period not exceeding 24 months after allotment of site.
9. **River basins wise development** may exist in the State where projects have been identified on a stand alone basis, with impact on down stream projects not having been taken into consideration fully. If an IPP can reconfigure the projects on a specific basin bringing about better utilization of resources, such IPP may make such consolidated proposal for the consideration of Government. Such project will be evaluated at par with **Self Identified Projects**, keeping in mind the amount of power likely to be generated in totality and the anticipated environmental impact. If such projects are considered by Government, the same may be allotted for which purpose the IPP may be asked to enter into an MOA with Govt.
10. For the purpose of allotment of projects in a transparent manner the MOA will be signed on a case to case basis through the help of experts/ consultants who will frame the parameters for selection.
11. IPP's are required to commit at least 1% of the project cost as mentioned in the DPR for social development/ welfare programs for the benefit of the local community in and around the project site which shall be administered by a Committee as mentioned at Chapter-V Clause (vii).
12. To protect the ownership and water usage rights of local people.
13. To address the problem of ecological imbalance and environmental degradation by adopting suitable remedial/ mitigating measures at the cost of the project.
14. Preference shall be given to locals and bonafide Meghalayans to develop Power in the State. Meghalayans in this context will mean a person(s) or a company incorporated under the Companies Act 1956, where the share holdings by the local tribals will be prescribed and at least one of the Directors of the Board should be a local resident of the State of Meghalaya.

15. To achieve electrification of all villages and rural households through schemes of the Central Government and to electrify the remote and inaccessible areas through Non-Conventional sources of energy.
16. In order to expedite the project selection process and so as to facilitate the smooth implementation of this policy, the State Govt. will constitute an **Empowered Committee** under the Chairmanship of the Minister i/c Power and such other members drawn from different Departments as may be notified by the Govt. with the following functions:
  - a) To determine the norms and procedure for selection of developers and other types of allottees of power projects within the policy parameters.
  - b) To finally select the developers of Power Plants of categories below 100MW of Hydel projects under this policy.
  - c) To approve the terms and conditions of the MOA's, Implementation Agreement/ Letter of Allotment and other such documents as specified which are required to be executed by the State Govt. and the concerned developers.
  - d) To consider and approve the incentives, monetary or otherwise, which may be made available to developers under this policy.
  - e) To suggest amendments to the policy as may be considered necessary.
  - f) To undertake a periodic review of the implementation of projects.
17. In order to expedite process of selection where a competitive bidding of hydro projects above 100 MW, a Cabinet Committee will be set up for finalization of the allotment of such projects.
18. The state Government will facilitate the establishment of Police outposts in the location where the project is to be located to provide security, if required, to the workers and the cost of which will be borne by the developer.
19. To establish and promote a State owned Power Trading entity .
20. To establish and promote a State owned Power Generating Company.
21. To promote Distribution Companies in the State.
22. To establish a State-owned Transmission utility e.g. Meghalaya ST company and strengthen the State Load Despatch Centre (SLDC).
23. Industries shall be encouraged to install their own captive plant to meet their energy requirement and to ease the pressure of capacity addition. However , from a long term perspective, since captive generation may not be the most efficient use of scarce resources and smaller projects are at the cost of economies of scale are, the State shall endeavor to provide adequate power of appropriate quality such that industry does not feel the need to establish expensive captive power. Therefore, while captive power generation shall be encouraged to assist in meeting short term power shortages, the State shall build a power system that is integrated and reliable and new generation should ideally be grid connected. Distributed generation and captive generation will be encouraged to exploit bio fuels and alternate fuels.

24. The IPP shall be encouraged to develop Non-Hydro projects through MOA/ICB route .
25. This policy shall come into operation from the date of its publication in the official gazette and will remain in force until superseded or modified by another.

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## CHAPTER – V

### GENERATION

In order to meet the increasing power demand and to harness the untapped power potential of the State, both hydro and thermal, the Govt. of Meghalaya has decided to involve the State Sector, Joint Sector, Central Sector and Private Sector for execution of power projects.

The various sectors are defined as under:

**i. State Sector :**

The State Government shall set up a State Generating Entity for promoting the Projects identified in the State Sector/Joint Sector.

The State Generating entity shall strictly follow the Govt. policy in terms of employment and other developmental activities.

**ii. Joint Sector:**

The State Generating entity shall also explore the possibility of joint ventures with other generating companies to achieve its objectives in view of the constraints of limited financial resources available with the State Government.

The State Generating entity and a generating company, selected by the process of bidding, shall enter into a joint venture agreement which will clearly define the extent of participation by each partner and sharing of risks relating to implementation and operation of the project.

**iii. Central Sector:**

Government of India undertakings such as NEEPCO, NHPC, NTPC, DVC, ONGC etc.

**iv. Private Sector:**

A registered private owned company/ consortium.

**A. HYDRO POWER DEVELOPMENT**

The hydro power potential of Meghalaya is 3000 MW which is about 3% of the total hydro potential of the country. The power potential harnessed so far is only 185 MW with another 84 MW under implementation. Addition of another 40 MW is also being undertaken. Thus there is scope for further development in the hydro potential.

The power projects have been divided into the following three categories for allotment to the eligible bidder i.e. a Company or a Consortium of Companies whether in the Public or Private sector.

**Category-I :** Small hydro projects up to 25MW capacity.  
Projects to be allotted through MOA Route in a transparent



manner. However, projects below 10MW to be implemented through local participation.

**Category-II :** Medium hydro Projects above 25 MW and below 100 MW. Projects to be allotted through MOA Route in a transparent manner.

**Category-III :** Large and mega Projects above 100 MW capacity. Projects to be allotted through ICB Route, unless it is handed over to Govt. of India Undertakings.

- i) As a long term strategy, the Government shall make efforts for survey and investigation of the potential hydro/ thermal sites and for preparation of bankable detailed project report (DPR) for future execution.
- ii) The generating company will be encourage to develop power plants in accordance with Section 8 of the Indian Electricity Act, 2003.
- iii) The generating companies may identify potential projects on their own. However, the generating companies shall have to approach the government before taking up such projects. The company should have a local registered office within the state and also a local director to participate in the project whose share will be transferable to the tribals only. All terms and conditions of this policy shall also apply to such projects also.
- iv) The State Govt. shall expedite suitable approval under the Meghalaya Land Transfer Act so as to facilitate investment in the Power Sector.
- v) Projects shall be named according to the location of the project and will be allotted on Build, Own, Operate & Transfer (BOOT) for a period of 35-40 years and thereafter the projects will revert back to the State Govt. free of cost.
- vi) Royalty shall be levied from the allotted projects in the form of free power @12% and above of the deliverable energy during that period starting from the date of synchronization of the first generating unit, out of which the Govt. will plough over 2% for sustainable development cost of the area where the project is situated. A tripartite committee consisting of the representative of the state Govt. developers of the projects and a representative of the local committee will decide the schemes to be taken up in the area in a transparent manner.
- vii) In view of the need to generate fund for development of environmental and social sector, Cess per unit of the power generated will be charged for meeting each of the following social development costs:
  - a) Green cess @ 1paise per unit.
  - b) Education @ 1paise per unit
  - c) Health @ 1paise per unit

- d) Sustainable development @ 1paise per unit, to be passed on to a Committee consisting of local people for the Project Affected Area and one nominee each from the Govt. and the Project developer.

However, projects below 25 MW will be exempted from payment of the cess.

- viii) An Upfront premium of Rs. 1.00 lakh per MW will be charged from all such projects on IPP/PPP/JV mode for those projects of 25 MW and above. 50% will be payable at the time of signing the MOA, 25 % at the time of signing the Implementation Agreement and the remaining 25% immediately at the time of financial closure.
- ix) The Developers shall be free to dispose of power from the Projects, after allowing for royalty in the shape of free power and meeting the demand in the State.
- x) The incentives /concessions offered by the Ministry of New and Renewable Energy shall be applicable for small hydro projects up to 25 MW. The State Govt. will facilitate setting up of such projects.
- xi) The State Govt. shall encourage setting up of Captive power projects by the private sector to augment the power supply. Private industries will be permitted to go for captive generation up to 60 MW subject to the aforesaid conditions. For higher captive capacity, decision will be taken by the State Government on a case to case basis. Open access shall be facilitated wherever necessary according to the provisions of the act.
- xii) The selection for IPPs will be based on efficiency and preference will be given to companies with strong technical and financial credentials.
- xiii) The State Govt. shall encourage de-centralized generation and distribution for remote and inaccessible areas where grid connectivity is either not feasible or not cost effective and the resources are available.
- xiv) Renovation, modernization & up-gradation of old hydro power stations shall be accorded priority as it is a faster and cheaper way of capacity addition than installing new capacity. The State Govt. would encourage Joint Ventures with the private sector at the plant level for Renovation and Modernization schemes with suitable bidding criteria.

## **B. THERMAL POWER PROJECTS DEVELOPMENT**

The State has a coal reserve of about 564 million tonnes, the calorific value of which ranges from 5694 kcal /kg to 9772 kcal/kg. The sulphur content of the coal ranges from 1.8% to 7.1% and the ash content ranges from 1.3% to 62%. The major coal reserves are in the southern belt of the State. Very close to these major coal reserves, there are huge quantities of limestone which is estimated at about 1000 million tonnes. Thus there is ample scope to develop thermal power stations to meet the baseload demand of the State. The detailed coal mine spreading over the state is enclosed at ANNEXURE – V.

The state has to exploit the abundant coal resource to meet the existing power crisis by setting up of Thermal Power Projects and maintain an ideal mix of 40:60 of hydro and thermal mix. With this in mind the state has set an ambitious target of achieving a capacity addition of 1000- 2000 MW Thermal power by end of 11<sup>th</sup>

plan on the basis of the following :

- i) Company or a Consortium of Companies, whether in the Public or Private sector will be encouraged for setting up of Thermal Power Project as per provision laid down in Section 7 of the Indian Electricity Act, 2003.
- ii) The generating companies may identify potential projects on their own and develop thermal power plants in compliance with section 7 of the Indian Electricity Act, 2003. However, the generating companies shall have to approach the Government for facilitating the project. All terms and conditions of this policy applicable to thermal power plants shall apply
- iii) The State Govt. shall expedite suitable approval under the Meghalaya Land Transfer Act so as to facilitate investment in the Power Sector.
- iv) The State Govt. shall encourage setting up of Captive power projects by the private sector/ public undertakings to augment the power supply. Open access shall be facilitated wherever necessary according to the provisions of the Act. Terms and conditions of this policy will be applicable to such captive power plants.
- v) In view of the need to generate fund for development of environmental and social sector, Cess per unit of the power generated will be charged for meeting each of the following social development costs:
  - a) Green cess @ 1paise per unit.
  - b) Education @ 1paise per unit
  - c) Health @ 1paise per unit
  - d) Sustainable development @ 1paise per unit, to be passed on to a Committee consisting of local people for the Project Affected Area and one nominee each from the Govt. and the Project developer.
- vi) Employment to the locals should be given priority according to the terms and conditions as may be agreed upon provided that such terms and conditions ensure at least 80% employment for the bonafide residents of the State in the Group C & Group D post and preference for employment for bonafide residents of the State in other categories.
- vii) The State Govt. shall encourage de-centralised generation and distribution for remote and inaccessible areas where grid connectivity is either not feasible or not cost effective and the resources are available.
- viii) With a view to expedite Letter of Allotment(LOA) in respect of coal fired projects, the Govt. of Meghalaya shall play a role of facilitator in coordinating various issues related to coal linkage with the coal mine owner of the state and coal block allocation with the Ministry of coal. The Govt. will facilitate establishment of a partnership with the power companies and the mine owners.
- ix) Any environmental issue has to be compensated for and in accordance with the guide lines issued by the MOEF Govt. of India.
- x) The Relief & Rehabilitation (R&R) package for Thermal power stations, wherever required, should adequately compensate and address the concern of the Projects Affected People (PAP).The generating companies should

also attend to the local needs through corporate social responsibility.

- xi) Developers should adopt technologies that improve machines gross efficiency in the interest of environmental protection, by using super critical technology, in line with the Integrated Energy Policy of the GOI.

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## CHAPTER – VI

### TRANSMISSION

#### **A. Status:**

Presently, the State of Meghalaya is facing an acute shortage of power due to the industrial load growth. The load is expected to increase further due to normal load growth and in view of the Central Government Policy to achieve 100% village electrification. Due to transmission constraints, power from other sources could not be utilized to the full extent.

According to the provisions in the Electricity Act 2003, all State Transmission Utilities and Transmission Licensees shall be obliged to provide, on demand, open access to their respective transmission system, subject to availability of spare capacity, on payment of transmission charges as specified by the appropriate Commission. This will facilitate multi-lateral energy transaction which shall ensure optimum utilization of the existing transmission assets besides providing prospective investment opportunities in the transmission sector.

#### **B. Policy :**

- i) The Govt. of Meghalaya shall establish a State Transmission Utility. The State Transmission Utility shall not engage in the business of generation or trading in electricity.
- ii) The State Transmission Utility shall build, maintain & operate an efficient, coordinated and economical transmission system within its territorial jurisdiction and shall be responsible for inter-connection arrangement between the generating company and distribution company/ user.
- iii) The State Transmission Utility shall prepare a comprehensive transmission master plan for the State. The master plan shall be prepared to cover the period till the end of Five-Year Plan periods. Keeping in view the international standards and practices, the transmission capacity would be planned and built with sufficient redundancy levels and margins for security of the system. Strengthening and extension of existing transmission system commensurate with projected load demand shall also be given due consideration while formulating the transmission master plan.
- iv) The State Transmission Utility shall coordinate with Central Transmission Utility in the planning of inter- state transmission systems relating to the State.



- v) The State Transmission Utility shall prepare a transmission plan for evacuation of power from new projects.
- vi) The State Transmission Utility shall levy transmission charges for wheeling of power through its transmission network.
- vii) The State Load Despatch Centre, which is responsible for supervisory control of the grid, shall operate under the State Transmission Utility.
- viii) The State Govt. shall encourage investment by the private sector in transmission projects to meet the policy objectives. The Govt. shall facilitate grant of right of way necessary for the projects.

\* \* \*

## CHAPTER – VII

### DISTRIBUTION

#### **A. Status :**

There are 16 towns and 5782 villages in the State of Meghalaya as per the 2001 Census. The number of villages having electricity as on 31<sup>st</sup> March, 2006 is 4217 which includes 28 numbers electrified by non-conventional renewable energy sources.

There were only 261 electrified villages in the State in 1975 when the Meghalaya State Electricity Board was created. Since then the villages were electrified through various schemes financed by loans from the Rural Electrification Corporation. Village electrification was suspended in 1996 when it was found to be unviable and a burden to the MeSEB. Subsequently, village electrification was resumed in 2000-01 by the MeSEB with 90% Grant and 10% Loan on the cost of the schemes from the State Government.

The performance of the distribution sector in the State at present is far from satisfactory especially in the rural areas. Unscheduled power interruptions and prolonged outages have invited severe criticism from the public. There are also frequent complaints of low voltage. Long HT & LT distribution lines passing through difficult hilly terrains coupled with the inadequate manpower have contributed to the present situation.

100% system metering on feeders up to 33KV has been achieved. However, 100% metering on distribution transformers is yet to be achieved, while the process to attain 100% consumer metering has commenced under APDRP. Action for energy auditing and accounting has also been initiated.

With a view to improve and introduce reforms in the distribution sector the Government of India launched the Accelerated Power Development Programme (APDP) during 2003 which was subsequently renamed as Accelerated Power Development Reforms Programme (APDRP) and is under implementation.

Similarly, to extend electric supply to all the villages & households in rural areas, the Government of India has recently launched the “Rajiv Gandhi Grameen Vidyutikaran Yojana – Scheme for Rural Electricity Infrastructure and Household Electrification” which is also under implementation in Meghalaya.

#### **B. Policy:**

- i) (a) The Government of Meghalaya shall establish Distribution Companies for different areas of the State to develop and maintain an efficient, coordinated and economical distribution system in their area of supply.
- (b) The tariff to be levied by the distribution companies on their consumers shall be in accordance with the methods and principles as specified by the State Electricity Regulatory Commission.
- ii) The Distribution Companies shall prepare comprehensive distribution master plans for their areas of operation. The master plans shall be prepared to cover the period till the end of Five-Year Plan periods. Keeping in view the present standards and practices, the distribution capacity would be planned and built with

sufficient redundancy levels and margins for security of the system. Strengthening and extension of existing distribution system commensurate with projected load demand shall also be given due consideration while formulating the distribution master plans.

- iii) The Distribution Companies shall improve the HT & LT ratio to 1:1 especially in the urban areas to improve the distribution system and reduce the system losses.
- iv) The Distribution Companies shall introduce the profit centre concept and to establish separate accounting for such centers in their area of operation in order to make the distribution business profitable and self sustainable.
- v) The Distribution Companies shall reduce the Aggregate Technical & Commercial (AT&C) losses by focusing on the following thrust areas :
  - a. 100% metering to all categories of consumers. All new connections should be metered.
  - b. Engagement of franchisees in certain areas of operation to make the distribution business in rural areas profitable and sustainable.
  - c. Implementation of Energy Auditing & Accounting in right earnest.
- vi) The Distribution Companies shall adopt the latest state-of-the-art technology in the distribution system to improve quality and reliability of power supply to the consumers.
- vii) Energy conservation and demand side management shall be given priority to optimize utilization of available power. Energy conservation measures shall be adopted in all Government buildings.
- viii) The State Government is committed to make electricity available to all the villages and rural households by the end of 11<sup>th</sup> Plan.
- ix) The State Government shall ensure timely execution of all distribution schemes both in urban and rural areas through regular monitoring.
- x) For sustainability of rural electrification, the State Government shall involve the local institutional bodies like village committees, non-governmental organisations, self-help groups, users' associations, village nodal persons, individual entrepreneurs, etc as franchisees for metering, billing and collection of revenue and management of the local distribution, as appropriate, from the village level upwards.
- xi) The State Government shall set up an autonomous Nodal Agency which shall be responsible for policy and planning, project implementation and management of the rural electricity services. Budgetary support to the Nodal Agency shall be provided by the State Government.

- xii) The State Government shall encourage decentralised generation and distribution for remote and inaccessible areas where grid connectivity is either not feasible or not cost effective and the resources are available.
- xiii) The State Government shall encourage private investment in the distribution sector in the form of licensees to meet the policy objectives. The State Govt. shall support the sector during the transition period till the distribution entities become financially viable and self sustaining. The transition period shall be determined by the Government.
- xiv) The State Government shall set up special courts to try cases relating to theft of electricity.

### **C. Electricity Franchisee**

The Government of India has launched a rural electrification scheme “Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY)” in April 2003 to provide electricity to all households within five years. As per RGGVY, the Ministry of Power will provide financial assistance for execution of the scheme. In order to maintain the infrastructure created, revenue sustainability becomes a crucial factor. An innovative step has been taken under the scheme which mandated community participation in electricity distribution. Thus the concept of village franchise for electricity evolved to address the issue of revenue sustainability, improvement in billing and collection systems and reduction of distribution loss in rural areas.

One condition of the RGGVY scheme is that the state has to set up franchisee frameworks in two years time from the sanction of the project for the management of distribution of electricity in rural areas. To fulfill the above stipulation, the state Government lays down the following policy to develop village franchisee in the State of Meghalaya.

#### **Policy :**

1. Selection of sites – Franchisee areas could include both rural villages and urban towns having distribution transformer of any capacity and consumer of any category. Franchisee arrangement could also be for systems beyond and including 11KV feeders.
2. Organization of franchisee – Franchisee can be a user’s association, NGO, village body, co-operative society or an individual entrepreneur.
3. Application for franchisee - The MeSEB will issue advertisement through the media inviting interested parties to apply for franchisee. The interested parties should submit “Expression of Interest (EOI)” along with the “No Objection Certificate (NOC)” from the village / local durbar.
4. Criteria for qualification as franchisee – The applicant for franchisee shall have the following qualification :

**Category A** - For user's association, NGO, village body and co-operative society :

- (a). Should have been actively involved for at least three years in any social development programme in the intended area or in the district or in the State with proven credibility to be certified by the District Commissioner.
- (b). Should have satisfactory financial and operational capabilities which shall be judged by both or any one below:-
  - (i). Proven achievement of completion of development programme involving outlay of not less than annual revenue collection projected in the intended area.
  - (ii). Engaged in any business operation with annual turnover of not less than annual revenue collection projected in the intended area.

**Category B** - For individual entrepreneur:-

- (a). Should ideally possess adequate financial resources to be supported by a banker's certificate that validates possession of finances equivalent to at least three months revenue collection projected in the intended area.

**For both Category A and B :**

- (a). Ability to source at least three skilled / semi-skilled employee for full time work.
- (b). Undertaking to undergo the training / capacity building programme organized by the DISCOM for the franchisee and their employees.

Since the duties and responsibilities of DISCOM is to supply electricity to the franchisee areas and ensure non-discriminatory behavior in case of power shortage, Maintain the HT distribution line, the Sub-station and the LT distribution line, the selection to be done in a transparent manner. Training of the franchisee has to be undertaken so that they are able to discharge their responsibility accordingly. A Committee headed by the Chief Executive Officer of the Distribution Company shall recommend the franchisee to the Board for selection. Clear Terms and conditions for the smooth functioning of the Franchisee has to be drawn up which will give a clear picture of the duties and obligations of each respectively.

\* \* \*



## CHAPTER -VIII

### **POLICY FOR PROMOTING GENERATION OF POWER THROUGH NON-CONVENTIONAL ENERGY SOURCES.**

#### **1. Involvement of Private Sector Investment :**

Meghalaya is endowed with rich natural resources for development of New Renewable Source of Energy like Small Hydro Project (SHP), Biomass gasification, solar energy and biogas. The hilly terrain offer favourable condition for harnessing small and micro hydel power projects. These immense natural resources if explored and tapped properly will be a great boon for the development of renewable non-conventional sources of energy.

There are many villages in Meghalaya which are situated in far flung areas, where a DISCOM will not be in a position to provide electricity on the ground of commercial viability. Therefore, it is imperative that for such remote villages, the non-conventional energy sources will play a vital role for providing power and electricity.

It is practically experienced that after installation and commissioning of the scheme / projects, the agency is not at all in the position to monitor the distribution, transmission and maintenance of the project due to various local factors

In view of the above facts and circumstances coupled with unforeseen problems, the State Government shall encourage the private producers to participate as a third party so that the projects could be commercially viable and remote villages could be benefited.

#### **2. Eligible Producers:**

- (i) All power producers generating grid-grade electricity from Non-Conventional Energy Sources such as solar, wind electric generators, small hydro plants, biomass combustion, biomass co-generation, waste recycling etc. will be “Eligible Producers” under the scheme.
- (ii) There will be no restriction on maximum generating capacity subject to the condition that power producers having installed capacity of less than 10 KW and more than 25 MW will not be treated as “Eligible Producers”.
- (iii) It shall not be necessary for such power producers to sell the electricity generated to DISCOM or its successor company. Such power producers producing electricity for captive consumption shall also be treated as eligible producers. However, if the third party is a consumer of the DISCOM and needs support of the DISCOM system in case of outage of the power station, then he will have to pay minimum charges as per rules of the DISCOM.

- (iv) There shall be no restriction on the legal form of power producing entrepreneur. Companies, cooperative, partnership individuals etc. would all be eligible producers provided they undertake to generate electricity from Non-Conventional Energy Sources.

3. **Grid Interfacing :**

- (i) Interfacing, including transformers, panels kiosk, protection metering, HT lines from the points of generation to the nearest HT lines etc. as well as their maintenance will be undertaken by the producers as per the specification and requirements of the DISCOM for which such eligible producers will bear the entire cost. Alternatively, these works and their maintenance could be undertaken by the DISCOM at charges to be decided by the DISCOM/ SERC when it is set up.
- (ii) Two separate meters, one for the receipt of power to the grid and another for release from the grid, will be installed on the HT side by the eligible producers at his cost. The meters and metering boxes will be sealed by the The State Transmission utility.

4. **Facilities by The State Transmission utility/DISCOM :**

- (i) **Wheeling :** The State Transmission utility will undertake to transmit on its grid the power generated by eligible producers and make it available to him for captive use or to a third party nominated by eligible producers for sale within the state, at an applicable wheeling charge . However, the third party will have to be HT consumers of the power unless this condition is relaxed specifically by the DISCOM.
- (ii) **Purchase of power at attractive price :** The DISCOM will purchase electricity offered by the developer as per the tariff fixed by the SERC on mutually accepted terms and conditions.

5. **Other Incentives:**

- (i) The producer will be allowed to use the water for power generation. Royalty on the water used for small Hydro Projects will be charged as admissible
- (ii) Infrastructural facilities such as approach roads, water supply, crane, power during construction period etc will be provided on the lines of industrial estates.
- (iii) **Exemption from Electricity Duty :** Consumption of electricity generated by eligible producer for its captive use or upon sale to a nominated third party will be exempted from electricity duty for a period of 5 years.
- (iv) **Sales Tax Benefits :** “Eligible Producer” will be eligible for Sales Tax/ VAT deferment/ remission under the provision of schemes notified in this respect by Finance Department as modified from time to time.

6. **Facilitation by Meghalaya Non-Conventional and Rural Energy Development Agency :**

Meghalaya Non-Conventional and Rural Energy Development Agency (MNREDA), as a state nodal agency for developing and promoting use of non-conventional energy production and use in the state of Meghalaya, shall facilitate clearances for the projects for producing electricity from Non-Conventional Sources at the State and Central levels on the lines of facilitation provided by Bureau of Industrial Promotion (BIP). MNREDA shall also facilitate grant of loans to such projects by Indian Renewable Energy Development Authority (IREDA) and subsidies by the Ministry of Non-Conventional Renewable Energy (MNRE).

7. **Applications for Clearances :**

- (i) A simple composite application form shall be devised which shall include application for all statutory approval as well. Producers intending to install electricity generation plants using a Non-Conventional Energy Sources will be permitted to submit their applications for meeting up such projects and for grid interfacing in this form to MNREDA and DISCOM.
- (ii) MNREDA/ State government. will provide clearance within a period of 2 months from the date of submission of application.
- (iii) An agreement will be entered into with the applicant producers within a period of one month from the date of such clearance provided.

8. **State Level Advisory Council :**

A State Level Advisory Council will be constituted to monitor the process of generation of electricity through Non-Conventional Sources and undertake review of the policy to aid and advice the State Government to make necessary changes in the policy, if required.

\* \* \*

**ACTUAL ENERGY CONSUMPTION INCLUDING LOSSES VIS-À-VIS PEAK DEMAND**

<b>Year</b>	<b>Peak Demand (In MW)</b>	<b>Energy Consumption (In Mkwh)</b>
2000-01	120.90	764.40
2001-02	148.47	786.89
2002-03	179.26	947.92
2003-04	192.20	1080.11
2004-05	196.81	1393.30
2005-06	197.10	1386.11

*Note : The energy consumption during 2005-06 as compared to 2004-05 is lower because of non-availability of power due to less rainfall & inter-state transmission constraints*

**UNRESTRICTED ENERGY REQUIREMENT VIS-À-VIS PEAK DEMAND**

<b>YEAR</b>	<b>EXPECTED PEAK DEMAND (in MW)</b>			<b>ESTIMATED ENERGY REQUIREMENT (in Mkwh)</b>		
	<b>OTHER CONSUMERS IN THE STATE + ASEB HT</b>	<b>IHT &amp; EHT INDUSTRIAL</b>	<b>TOTAL</b>	<b>OTHER CONSUMERS IN THE STATE + ASEB HT</b>	<b>IHT &amp; EHT INDUSTRIAL</b>	<b>TOTAL</b>
2006-07	160.000	334.000	494.000	913.230	2925.840	3839.070
2007-08	176.000	367.400	543.400	992.435	3218.424	4210.859
2008-09	193.600	404.140	597.740	1080.539	3540.266	4620.805
2009-10	212.960	444.554	657.514	1174.644	3894.293	5068.937
2010-11	234.256	489.009	723.265	1277.008	4283.719	5560.727
2011-12	257.682	537.910	795.592	1388.364	4712.092	6100.456
2012-13	283.450	591.701	875.151	1509.507	5183.301	6692.808
2013-14	311.795	650.871	962.666	1641.303	5701.630	7342.933
2014-15	342.975	715.958	1058.933	1784.700	6271.792	8056.492
2015-16	377.273	787.554	1164.827	1940.725	6898.971	8839.697
2016-17	415.000	866.309	1281.309	2110.499	7588.867	9699.365
2017-18	456.500	952.940	1409.440	2295.242	8347.754	10642.997
2018-19	502.150	1048.234	1550.384	2496.290	9182.530	11678.820
2019-20	552.365	1153.057	1705.422	2715.090	10100.779	12815.869
2020-21	607.602	1268.363	1875.965	2953.223	11110.860	14064.083
2021-22	668.362	1395.199	2063.561	3212.412	12221.943	15434.355
2022-23	735.198	1534.719	2269.917	3494.532	13444.138	16938.670
2023-24	808.718	1688.191	2496.909	3801.630	14788.553	18590.183
2024-25	889.590	1857.010	2746.600	4135.932	16267.408	20403.339

**LIST OF PROJECTS IDENTIFIED FOR SURVEY &  
INVESTIGATION  
DURING THE 11<sup>TH</sup> & 12<sup>TH</sup> PLAN**

1. Umngi HEPP Stage – I	-	54 MW
2. Umngi HEPP Stage – II	-	65 MW
3. Umngi HEPP Stage- III	-	120 MW
4. Umiam – Umtru Stage – V	-	30 MW
5. Selim HEPP	-	170 MW
6. Mawblei HEPP	-	140 MW
7. Ganol HEPP	-	22.5 MW
8. Umngot HEPP	-	260 MW
9. Myntdu HEPP Stage – II	-	60 MW
10. Riangdo HEPP	-	5 MW

\* \* \*



**LIST OF PROJECTS EXPECTED TO BE  
COMMISSIONED DURING THE 11<sup>TH</sup> PLAN**

1.	Myntdu HEPP Stage-I	-	84 MW
2.	Sonapani MHPP	-	1.5 MW
3.	Lakhroh MHPP	-	1.5 MW
4.	New Umtru HEPP	-	40 MW
5.	Ganol HEPP	-	22.5 MW
6.	Umngot HEPP Stage-I	-	260 MW
7.	Umngi HEPP Stage-I	-	54 MW
8.	Myntdu HEPP Stage-II	-	60 MW
9.	Umiam Umtru HEPP Stage-V	-	30 MW
10.	Riangdo HEPP	-	5 MW

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**LIST OF PROJECTS EXPECTED TO BE  
COMMISSIONED DURING THE 12<sup>TH</sup> PLAN**

1.	Selim HEPP	-	84 MW
2.	Mawblei HEPP	-	140 MW
3.	Nongkohlait HEPP	-	120 MW
4.	Umngi Stage-II Rangmaw HEPP	-	65 MW
5.	Amkshar MHEPP Stage-I	-	5 MW
6.	Sanglet MHEPP	-	2 MW
7.	Simsang HEPP	-	135 MW
8.	Umngi Stage-IV (Nongram) HEPP	-	50 MW
9.	Suchen HEPP	-	50 MW
10.	Umkhen Stage-I HEPP	-	20 MW
11.	Umngi Stage-V (Mawpat) HEPP	-	85 MW
12.	Umngot Stage-II HEPP	-	60 MW
13.	Umlaphang HEPP	-	50 MW
14.	Upper Khri HEPP	-	25 MW

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**TECHNICAL DATA ON VARIOUS COAL DEPOSITS OF MEGHALAYA**  
**( KHASI HILLS )**

**1. LAITRYNGEW :**

(i)	Location	South of Shillong at 43 Km on Shillong – Cherrapunjee road, Khasi Hills.
(ii)	Area and extent	Covers an area of 31 Sq. Kms. Seam thickness : Top - Sporadic Middle - 0.36 m Bottom - 0.90 m
(iii)	Physical properties	Both lump and soft coal
(iv)	Chemical analysis	Moisture % 1.40 Ash % 11.50 Volatile matter % 41.20 Fixed carbon % 45.90 Calorific value 6,761 K Cal/Kg
(v)	Reserve	The inferred reserve for the middle seam 429,173 tonnes and for the bottom seam 2,308,966 tonnes were calculated for an area of 2.56 Sq. Kms.
(vi)	Nature of the deposit	The top seam is sporadic in occurrence while the middle and bottom seams are bedded.
(vii)	Geology of the area	The coal occurs in the Middle Sylhet Sandstone Member of the Shella Formation
(viii)	Reported by	Geological Survey of India

**2. CHERRAPUNJEE :**

(i)	Location	Around Cherrapunjee, Khasi Hills
(ii)	Area and extent	Covers an area of 36 Sq. Kms. Two coal seams were encountered in the area with thickness : Upper seam - 0.30 m Lower seam - 0.45 – 2.7 m
(iii)	Physical properties	Both lump and soft coal
(iv)	Chemical analysis	Moisture % 1.4 to 2.0 Ash % 4.3 to 10.3 Volatile matter % 41.5 to 42.5 Fixed carbon % 46.8 to 51.2 Calorific value 7,233 to 7,644 K Cal/Kg
(v)	Reserve	The inferred reserve is 19.0 million tones
(vi)	Nature of the deposit	Bedded type of deposit.
(vii)	Geology of the area	Same as Laitlyngrew area
(viii)	Reported by	Geological Survey of India
(ix)	Remarks	The lower seam of coal has almost been worked out.

### 3. LAITDUH :

(i)	Location	West of Laitryngew
(ii)	Area and extent	Covers an area of 0.12 Sq. Kms. Only one coal seam with an average thickness of 0.92 m was encountered.
(iii)	Physical properties	Coal is generally dust, contains specks of pyrite and fossil resin.
(iv)	Chemical analysis	Moisture %                      2.18 to 8.16 Ash %                              4.16 to 18.53 Volatile matter %              29.13 to 54.01 Fixed carbon %                 32.53 to 50.75
(v)	Reserve	The proved reserve is 0.12 million tones
(vi)	Nature of the deposit	Bedded type of deposit
(vii)	Geology of the area	The coal seam occurs in the Middle Sylhet Sandstone Member of the Shella Formation
(viii)	Reported by	Directorate of Mineral Resources, Meghalaya

### 4. MAWBEHLARKAR :

(i)	Location	Mawbehlarkar, Khasi Hills
(ii)	Area and extent	Covers an area of 0.1 Sq. Kms having only one coal seam of average thickness of 1 metre.
(iii)	Physical properties	The coal is compact, splintery and has smoothy conchoidal fracture and pitchy luster brownish in colour and contain iron pyrite
(iv)	Chemical analysis	Moisture %                      3.9 Ash %                              2.9 Volatile matter %              45.1 Fixed carbon %                 48.1
(v)	Reserve	The indicated reserve is 0.12 million tonnes
(vi)	Nature of the deposit	Bedded type of deposit
(vii)	Geology of the area	Coal occurs in the Middle Sylhet Sandstone Member of the Shella Formation
(viii)	Reported by	Directorate of Geology & Mining, Assam

### 5. MAWSYNRAM :

(i)	Location	Mawsynram, Khasi Hills. Occures in Rongsakham, Jathang and Mawsngi area
(ii)	Area and extent	Two coal seams occur in Rongsakham Hill with the following thickness : Upper seam                      -              0.5 m Lower seam                        -              0.6 – 1.3 m
(iii)	Physical properties	The coal is generally soft powdery but it is hard and lumpy where it attains maximum thickness
(iv)	Chemical analysis	Moisture %                      6.98 Ash %                              13.90 Volatile matter %              34.90 Fixed carbon %                 44.22 Sulphur %                        1.99 Calorific value                  5,859 K Cal/Kg.

## 6. LUMDIDOM :

(i)	Location	Near Tyrsad, Khasi Hills
(ii)	Area and extent	Coal occurs in an area of 0.2 Sq. km in Lumdidom having one coal seam of 1 m average thickness. In the adjacent hill at Umsawmat, the coal is only 0.20 m thick and is impersistant in nature.
(iii)	Physical properties	The coal is bright, compact and shabby
(iv)	Chemical analysis	Moisture % 1.4 to 7.4 Ash % 24.5 to 62.0 Volatile matter % 30.8 to 36.0 Fixed carbon % 35.5 to 37.8 Sulphur % 2.2 to 2.6 Calorific value 5730 to 6510 K Cal/Kg
(v)	Reserve	The indicated reserve in the Lumdidom area is 0.2 million tones
(vi)	Nature of the deposit	Bedded type of deposit.
(vii)	Geology of the area	The coal occurs in the Lower Sylhet Sandstone Member of Eocene age.
(viii)	Reported by	Directorate of Mineral Resources, Meghalaya

## 7. LANGRIN :

(i)	Location	Situated in the south western part of Khasi Hills and the area is bounded by Kynshi river on east and Maheshkhola river on west. On the northern side the boundary is the Um Bytit river.
(ii)	Area and extent	Out of the seven seams present in the area, four seams were considered for reserve calculation. Thickness of these four seams are 0.60 m, 1.21 m, 0.90 m and 1.10 m respectively.
(iii)	Physical properties	The coal is bright hard and compact.
(iv)	Chemical analysis	Moisture % 1.9 to 6.9 Ash % 2.7 to 9.2 Volatile matter % 40.9 to 56.6 Fixed carbon % 34.3 to 49.2 Sulphur % 3.0 to 4.2
(v)	Reserve	The indicated reserve is 97.61 million tones considering only 4 (four) seams of coal
(vi)	Nature of the deposit	Bedded type of deposit
(vii)	Geology of the area	Coal occurs in the lower Sylhet Sandstone of Eocene Age
(viii)	Reported by	Geological Survey of India.

## 8. EAST DARRANGGIRI :

(i)	Location	Western part of Khasi Hills and South eastern part of Garo Hills
(ii)	Area and extent	Covers an area of 21 Sq. and is consisted of several small coal deposits. Two seams of coal were encountered of which the lower seams is 1 m thick.

(iii)	Physical properties	Lump to dusty variety of coal
(iv)	Chemical analysis	Moisture % 4.84 to 8.42 Ash % 3.79 to 8.34 Volatile matter % 36.84 to 41.40 Fixed carbon % 46.10 to 51.34 Sulphur % 2.21 to 3.00 Calorific value 6,111 to 6,847 K Cal/Kg
(v)	Reserve	The inferred reserve is 31.50 million tonnes
(vi)	Nature of the deposit	Bedded type of deposit
(vii)	Geology of the area	Coal occurs in the Sylhet Sandstone (Tura) Member of Lower to Middle Eocene age
(viii)	Reported by	Geological Survey of India

#### 9. PYNURSLA AND LYNKYRDEM :

(i)	Location	Around Pynursla, East Khasi Hills
(ii)	Area and extent	Covers an area of 2 Sq. Km Out of the 5 (five) seams in the Lynckyrdem area, seam No. 2 and 4 with thickness varying from 0.4 to 0.65 and 0.45 to 0.80 m respectively are taken into consideration. There are two seams in the Thanjinath hill near Pynursla.
(iii)	Physical properties	Lump to dust variety of coal
(iv)	Chemical analysis	Moisture % 4.84 to 8.42 Ash % 3.79 to 8.34 Volatile matter % 36.84 to 41.40 Fixed carbon % 46.10 to 51.34 Sulphur % 2.21 to 3.00 Calorific value 6,111 to 6,847 K Cal/Kg
(v)	Reserve	The inferred reserve is 31.50 million tonnes
(vi)	Nature of the deposit	Bedded type of deposit
(vii)	Geology of the area	Coal occurs in the Sylhet Sandstone (Tura) Member of Lower to Middle Eocene age
(viii)	Reported by	Geological Survey of India

#### 10. MAWLONG-SHELLA-ISHAMATI :

(i)	Location	It is located at a distance of 90 Km from Shillong along Shillong-Cherra-Salhel road.
(ii)	Area and extent	Covers an area of 8 Sq. Km having one coal seam of 0.6 to 1.20 m in thickness.
(iii)	Physical properties	The coal is generally soft, but it is hard and lumpy where it attains maximum thickness
(iv)	Chemical analysis	Moisture % 4.40 Ash % 7.94 Volatile matter % 33.92 Fixed carbon % 51.74 Sulphur % 3.46 Calorific value 9772 K Cal/Kg

(v)	Reserve	The inferred reserve of coal in the coal field is 12 million tonnes as estimated by the D.G.M. Assam, over an area of 7.68 Sq. Km taking 1.2 mt average thickness of the coal. According to G.S.I.'s assessment, the inferred reserve of coal is 9.0 million tones over an area of 7.7 Sq. Km taking the average thickness of the seams as 0.90 m.
(vi)	Nature of the deposit	Bedded type of deposit
(vii)	Geology of the area	A coal seams occurs in the Middle Sylhet (Lakadong) Sandstone Member overlain and underlain by the other Members of the Shella formation.
(viii)	Reported by	D.G.M., Assam and Geological Survey of India

### ( GARO - HILLS )

#### 11. WEST DARRANGGIRI :

(i)	Location	West Darranggiri, Garo Hills
(ii)	Area and extent	Covers an area of 47.0 Sq. Kms. Out of 3 (three) coal seams one seam of 1.6 m average thickness (main seam) is persistant throughout the whole area.
(iii)	Physical properties	The coal is bright, and devoid shale partings. It breaks into small fragments.
(iv)	Chemical analysis	Moisture %                      6.98 to 12.50 Ash %                              1.30 to 10.20 Volatile matter %              36.60 to 43.00 Fixed carbon %                44.90 to 47.10 Calorific value                 5720 to 7,633 K Cal/Kg
(v)	Reserve	The total inferred reserve of coal in the West Daranggiri coal field as estimated by G.S.I. is 127.00 million tones over an area of 47 Sq. Km. In the main block of the coal field having 25 Sq. Km area the reserve of 60 million tonnes is estimated in to Rongkhandi block, over 0.84 Sq. Km area. Therefore, the approved reserve is 62.0 million tones over an area of 25.84 Sq. Kms. The Directorate of Geology and Mining, Assam proved an indicated reserve of 3 million tones of coal in the mining hill, whereas another 2 million tones is approved by the Directorate of Mineral Resources Meghalaya in the same area.
(vi)	Nature of the deposit	Bedded type of deposit
(vii)	Geology of the area	The coal occurs in the Sylhet Sandstone Member of Eocene Age which overlies the weathered platform of older gneissic rocks..
(viii)	Reported by	1. Inferred reserve reported by Geological Survey of India 2. Indicated and approved reserve report by Directorate of Geological and Mining, Assam and Directorate of Mineral Resources, Meghalaya respectively.



## 12. SIJU, GARO HILLS :

(i)	Location	Siju, Garo Hills.
(ii)	Area and extent	The coal seam is traced for about 11 Km in strike length. Along the dip direction, an average of 300 m is taken into consideration. One coal seam was located in the area with a variable thickness of 0.7 to 1.8 metres.
(iii)	Physical properties	The coal is soft and friable
(iv)	Chemical analysis	Moisture % 3.30 Ash % 4.16 Volatile matter % 38.58 Fixed carbon % 53.36 Sulphur % 1.80 Calorific value 6,916 K Cal/Kg
(v)	Reserve	The Geological Survey of India estimated an inferred reserve of 125.0 million tones in that area.
(vi)	Nature of the deposit	Bedded type of deposit
(vii)	Geology of the area	Coal occurs in the Sylhet (Lakadong) Sandstone Member of Lower to Middle Eocene Age.
(viii)	Reported by	Geological Survey of India.

## 13. PENDENGRU – BALPHAKRAM :

(i)	Location	Pendengru-Balphakram, south eastern extremity of Garo Hills.
(ii)	Area and extent	Covers an area of 13 Sq. Km having 8 (eight) seams of coal ranging in thickness from 0.3 to 3.0 mts.
(iii)	Chemical analysis	Moisture % 1.60 to 11.20 Ash % 3.00 to 15.00 Volatile matter % 37.00 to 50.00 Fixed carbon % 37.40 to 48.40
(iv)	Reserve	An indicated reserve of 107 million tones was reported by Geological Survey of India
(v)	Nature of the deposit	Bedded type of deposit
(vi)	Geology of the area	Same as the Siju area
(vii)	Reported by	Geological Survey of India.

## 14. SELSELA BLOCK :

(i)	Location	Selsela Block, Garo Hills ( A part of the Karaibari coal field)
(ii)	Area and extent	A- 15 Km long belt of coal extends from Dalangsa to Bolchugiri. At Dalangsa the thickness varies from 0.20 to 0.30 m while at Bolchugiri is ranges from 1.00 m to 1.30 m.
(iii)	Physical properties	Soft and friable coal
(iv)	Chemical analysis	Moisture % 6.1 to 15.4 Ash % 3.1 to 24.2 Volatile matter % 35.3 to 54.0 Fixed carbon % 18.9 to 39.8
(v)	Reserve	Not estimated

(vi)	Nature of the deposit	Bedded type of deposit
(vii)	Geology of the area	The coal occurs in the Sylhet Sandstone Middle to Lower Eocene Age.
(viii)	Reported by	Directorate of Mineral Resources, Meghalaya.

### ( JAINTIA HILLS )

#### 15. BAPUNG :

(i)	Location	2.1 Kms away from Jowai along Jowai Badarpur Road, Jaintia Hills
(ii)	Area and extent	There are 3 coal seams covering an area of 46 Sq. Km. The thickness is as follows : Upper seam - 0.6 m Middle seam - 0.5 m Bottom seam - 0.3 to 1.2 m
(iii)	Physical properties	Hard, lumpy and bright in case of bottom seam. Coal of top seam is friable and soft.
(iv)	Chemical analysis	Moisture % 2.20 to 9.20 Ash % 2.60 to 7.87 Volatile matter % 38.30 to 44.30 Fixed carbon % 46.20 to 52.30 Sulphur % 3.20 to 7.10 Calorific value 7494 K Cal/Kg
(v)	Reserve	The total inferred reserve of coal as estimated by the Directorate Mineral Resource is about 7 million tones. Geological Survey of India estimated and indicated reserve of 5.7 million tones and proved 0.118 million tones from this area in 1963. Latest estimated inferred reserve of coal is 33.66 million tones as estimated by Directorate of Mineral Resources, Meghalaya in 1979.
(vi)	Nature of the deposit	Bedded type of deposit
(vii)	Geology of the area	The coal occurs in the Lower Sylhet Sandstone Member of Eocene Age.
(viii)	Reported by	1. Inferred reserve reported by Directorate of Mineral Resources, Meghalaya 2. Indicated and proved reserve by the Geological Survey of India.

#### 16. LAKADONG :

(i)	Location	Umlatdoh village of Lakadong area, Jaintia Hills
(ii)	Area and extent	One coal seam of 0.3 to 2.13 m in thickness with maximum of 3.50 m was encountered over an area of 3.0 Sq. Kms.
(iii)	Physical properties	The coal is hand of of lump variety having carbonaceous shale parting.
(iv)	Chemical analysis	Moisture % 0.44 to 0.86 Ash % 2.25 to 24.70 Volatile matter % 29.68 to 33.50 Fixed carbon % 44.76 to 59.86 Sulphur % 3.40 to 4.96 Calorific value 5,694 – 7,500 K Cal/Kg

(v)	Reserve	The indicated reserve as estimated by the Directorate of Geology and Mining, Assam is 1.5 million tonnes
(vi)	Nature of the deposit	Bedded type of deposit
(vii)	Geology of the area	The coal occurs in the Middle Sylhet Sandstone Member of the Shella Formation.
(viii)	Reported by	Directorate of Geology and Mining, Assam

#### 17. SUTNGA :

(i)	Location	Sutnga , Jaintia Hills
(ii)	Area and extent	There are two coal seams covering an area of 0.160579 Sq. Km. having thickness as follows. The top seam is 0.10 to 0.20 m and the bottom seam is 0.30 – 0.60 m in thickness. This coal field is the eastern extension of Bapung coal field.
(iii)	Physical properties	The coal is similar to that of Bapung area in physical character.
(iv)	Chemical analysis	Moisture %                      1.3 to 7.0 Ash %                              2.2 to 9.7 Volatile matter %              32.9 to 42.8 Fixed carbon %                49.9 to 53.2
(v)	Reserve	The inferred reserve estimated by the Directorate of Geology and Mining, Assam for the bottom seam only is 0.65 million tones.
(vi)	Nature of the deposit	Bedded type of deposit
(vii)	Geology of the area	The coal occurs in the Lower Sylhet Sandstone Member of Eocene Age.
(viii)	Reported by	Directorate of Geology and Mining, Assam

#### 18. JARAIN :

(i)	Location	Jarain, Jaintia Hills
(ii)	Area and extent	There is only one coal seam with a variable thickness of 0.3 to 1.10 m covering an area of 2.8 Sq. Kms.
(iii)	Physical properties	Both soft and hard variety of coal
(iv)	Chemical analysis	Moisture %                      1.22 to 1.60 Ash %                              4.40 to 6.70 Volatile matter %              41.62 to 48.10 Fixed carbon %                45.90 to 50.46 Sulphur %                        2.70 Calorific value                 6,944 K Cal/Kg
(v)	Reserve	The total inferred reserve is 1.1 million tones.
(vi)	Nature of the deposit	Bedded type of deposit
(vii)	Geology of the area	The coal occurs in the Lower Sylhet Sandstone Member of Eocene Age
(viii)	Reported by	Directorate of Geology and Mining, Assam

**19. MUSIANG LAMARE :**

(i)	Location	Musiang Lamare near Lumshnong, Jaintia Hills
(ii)	Area and extent	Covers an area of 2.31 Sq. Km with a coal seam of variable thickness from 0.15 to 0.65 m.
(iii)	Physical properties	Hard and lump coal
(iv)	Chemical analysis	Moisture % 0.6 to 3.6 Ash % 1.3 to 21.2 Volatile matter % 32.6 to 40.0 Fixed carbon % 42.1 to 60.4
(v)	Reserve	Directorate of Mineral Resources, Meghalaya estimated an inferred reserve of 1.1 million tones in the area
(vi)	Nature of the deposit	Bedded type of deposit
(vii)	Geology of the area	The coal occurs in the Middle Sylhet Sandstone Member of Eocene Age, overlain by the Umlatdoh Limestone.
(viii)	Reported by	Directorate of Mineral Resources, Meghalaya

**20. IOKSI :**

(i)	Location	Ioksi, near Garampani, Jaintia Hills
(ii)	Area and extent	Coal occurs in an area of 3.6 Sq. Km with an average thickness of 0.80 m.
(iii)	Physical properties	The coal is hard, bright and well jointed.
(iv)	Chemical analysis	Moisture % 4.2 to 7.5 Ash % 6.0 to 18.1 Volatile matter % 33.0 to 43.4 Fixed carbon % 41.3 to 46.4
(v)	Reserve	The inferred reserve as estimated by the Directorate of Mineral Resources is 1.24 million tones
(vi)	Nature of the deposit	Bedded type of deposit
(vii)	Geology of the area	The coal occurs in the Lower Sylhet Sandstone of Eocene Age.
(viii)	Reported by	Directorate of Mineral Resources, Meghalaya.