16

STANDING COMMITTEE ON ENERGY (2010-2011)

FIFTEENTH LOK SABHA

MINISTRY OF NEW AND RENEWABLE ENERGY

SMALL AND MINI HYDEL PROJECTS

SIXTEENTH REPORT

LOK SABHA SECRETARIAT
NEW DELHI

March, 2011/*Phalguna,* 1932 *(Saka)*

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Presented to Lok Sabha on 18.03.2011
Laid in Rajya Sabha on 18.03.2011

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(2010-2011)

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INTRODUCTION

I, the Chairman, Standing Committee on Energy, having been authorized by the Committee to present the Report on their behalf, present this Sixteenth Report on 'Small and Mini Hydel Projects' pertaining to the Ministry of New and Renewable Energy.

2. The Committee took evidence of the representatives of the Ministry of New and Renewable Energy on 12th January, 2011. The Committee wish to express their thanks to the representatives of the Ministry for appearing before the Committee for evidence and furnishing the information, desired by the Committee in connection with the issues relating to the subject.

3. The Report was considered and adopted by the Committee at their sitting held on 3rd March, 2011.

4. The Committee place on record their appreciation for the valuable assistance rendered to them by the officials of the Lok Sabha Secretariat attached to the Committee.

5. For facility of reference and convenience, the observations and recommendations of the Committee have been printed in bold letters in Part-II of the Report.

NEW DELHI;
08 *March*, 2011
17 *Phalguna*, 1932 *(Saka)*

MULAYAM SINGH YADAV,
Chairman,
Standing Committee on Energy.

REPORT

PART I

NARRATION ANALYSIS

I. INTRODUCTORY

One of the responsibilities entrusted to the Ministry of New and Renewable Energy (MNRE) is to deal with the micro/mini/small hydropower plants upto 25 MW capacity. Administrative responsibility of policy/planning of hydro-plants over 25 MW capacity is the responsibility of the Ministry of Power. The estimated potential for power generation in the country from small/mini/hydel projects is 15,380 MW from 5718 identified sites. Out of this potential about 50% lies in the States of Himachal Pradesh, Uttarakhand, Jammu and Kashmir and Arunachal Pradesh. In the plain region Maharashtra, Chhattisgarh, Karnataka and Kerala have also sizeable potential. As on 31st December, 2010, it has been reported that 790 small hydropower projects aggregating to 2939 MW have been set up in various parts of the country and 281 projects of about 927 MW are in various stages of implementation.

1.2 Small hydro power projects have reached commercial stage. The projects are normally economically viable and private sector has started showing interest in investing in the Small Hydro Power (SHP) Projects. The Ministry has been providing Central Financial Assistance (CFA) to State Governments and private sector to set up small/mini hydro projects. The Ministry is also organizing technical support towards survey and investigation, prepration of DPRs, project monitoring and training through Alternate Hydro Energy Center (AHEC), IIT, Roorkee.

1.3 Small hydel projects normally do not encounter the problems associated with large hydel projects of deforestation and resettlement. The projects have potential to meet power requirements of remote and isolated areas. These factors make small hydel as one of the most attractive renewable source of grid quality power generation.

1.4 According to the MNRE, a series of steps have been taken to promote development of SHP, in a planned manner and improve reliability and quality of the projects. By giving various physical and financial incentives, investments have been attracted in commercial SHP projects

apart from subsidizing State Governments to set up small hydro projects. The Ministry is giving special emphasis to promote use of new and efficient designs of water mills for mechanical applications as well as electricity generation and setting up of micro hydel projects upto 100 KW for remote village electrification. These projects are taken up with the involvement of local organizations such as the Water Mills Associations, cooperative societies, registered NGOs, village energy cooperatives, and State Nodal Agencies.

1.5 Since 1993-94, the thrust of the Ministry's SHP programme has reportedly been deployment of SHP projects through private sector investments. Now a large part of capacity addition is being achieved through private investment. State Nodal Agencies provide assistance for obtaining necessary clearances, in allotment of land and potential sites. As per the Electricity Act, 2003, the State Electricity Regulatory Commissions (SERCs) have been empowered to decide on various components of the policy such as tariff, wheeling, banking and third party sale for grid interactive renewable energy based power projects, in their respective States. The Policy for SHP and private sector participation therein, is governed by the Electricity Act, 2003; the National Electricity Policy, 2005; and Tariff Policy, 2006 announced by the Government of India.

II. SMALL/MINI-HYDEL POTENTIAL

1.6 The State-wise details of the estimated potential for power generation of 15,380 MW from 5718 identified sites in the country from small/mini-hydel projects (as on 31.12.2010) are as under:

Sl. No.	State	Potential		Projects Installed		Projects under Implementation	
		Nos.	Total Capacity (MW)	Nos.	Capacity (MW)	Nos.	Capacity (MW)
1.	Andhra Pradesh	497	560.18	62	189.83	18	61.75
2.	Arunachal Pradesh	550	1,328.68	101	78.835	28	38.71
3.	Assam	119	238.69	4	27.11	4	15
4.	Bihar	95	213.25	11	52.8	18	41.81
5.	Chhattisgarh	184	993.11	6	19.05	1	1.2
6.	Goa	6	6.5	1	0.05	-	-
7.	Gujarat	292	196.97	4	12.6	-	
8.	Haryana	33	110.05	7	70.1	2	3.4
9.	Himachal Pradesh	536	2,267.81	110	369.385	42	138.2
10.	Jammu & Kashmir	246	1,417.80	34	129.33	5	5.91
11.	Jharkhand	103	208.95	6	4.05	8	34.85
12.	Karnataka	138	747.59	110	723.05	18	107.5
13.	Kerala	245	704.1	20	136.87	7	23.8
14.	Madhya Pradesh	299	803.64	11	86.16	4	19.9
15.	Maharashtra	255	732.63	39	263.825	15	51.7
16.	Manipur	114	109.13	8	5.45	3	2.75
17.	Meghalaya	101	229.8	4	31.03	3	1.7
18.	Mizoram	75	166.93	18	36.47	1	0.5
19.	Nagaland	99	188.98	10	28.67	4	4.2
20.	Orissa	222	295.47	10	79.625	5	3.93
21.	Punjab	237	393.23	42	152.45	16	22.15
22.	Rajasthan	66	57.17	10	23.85	-	-
23.	Sikkim	91	265.55	16	47.11	2	5.2
24.	Tamil Nadu	197	659.51	16	94.05	6	33
25.	Tripura	13	46.86	3	16.01	-	-
26.	Uttar Pradesh	251	460.75	7	23.3	-	-
27.	Uttarakhand	444	1,577.44	95	134.12	55	230.65
28.	West Bengal	203	396.11	24	98.9	16	79.25
29.	A&N Islands	7	7.27	1	5.25	-	-
	Total	**5718**	**15384.15**	**790**	**2939.33**	**281**	**927.06**

1.7 On being asked about the action plan of the Ministry to exploit the untapped identified potential from small hydro power projects, the Ministry in a note stated:—

> "A major part of capacity addition and exploitation of small hydro power (SHP) potential in future is expected from private sector projects. With a capacity addition of 1400 MW (target for the 11th Plan), the total installed capacity from SHP projects would be 3375 MW at the end of 11th Plan. Taking in to consideration the allotment of sites made by the States, project implementation schedules and with a reasonable growth rate in the sector, it is expected that about 2000 MW capacity would be added during 12th Plan and about 3000 MW during the 13th Plan period. This would take the total installed capacity from SHP projects to about 8500 MW in the year 2021-22 (about 60% of the existing potential)."

1.8 When enquired by the Committee about the low targets of 2000 MW projected for the 12th Plan and 3000 MW for the 13th Plan, the Ministry in a note stated:—

> "The gestation period to set up a small hydro project is about 4-5 years including time required for survey and investigation, DPR preparation, various clearances and construction of project at site. Any effort to accelerate capacity addition from SHP project done today would result the capacity addition only after 4 years or so. The present rate of capacity addition from SHP project is 300 MW per year. With a reasonable growth rate it is expected that this would go to about 450 to 500 MW per year in the 3rd/4th year of the 12th Plan. This is also based on the number of projects allotted to the private sector by the States and their scheduled date of completion. Keeping this in view, a realistic target of 2000 MW has been arrived at. Assuming a similar trend and availability of potential in the States, a 50% increase in the target of 12th Plan is projected for the 13th Plan."

1.9 In reply to a further query by the Committee, the Ministry further stated that the annual targets and the proposed 12th Plan target is fixed taking into consideration the allotment of sites, project implementation schedules and actual physical progress in the projects. Also that the targets are quite realistic from achievement point of view.

1.10 Explaining overall existing installed capacity from SHPs and its growth in the coming years, the Secretary, MNRE, during the evidence held on 12th January, 2011 elaborated as under:—

> "Target of 130 MW was set in the ninth plan and we achieved 270 MW. Target of 550 MW was set up in the 10th Plan and 540 MW was achieved. In this plan (11th), the target has been increased to near 200 per cent. We have set the target of 2000 MW and 3000 MW for the next plan (for 12th and 13th Plans respectively) period. Gradually, it has increased. In this connection, the State as well as the investors were less experienced. Gradually, they are gaining experience. Now, more entrants are there in this sector who can do it privately because the States don't have much resources or capacity that they may construct on their own everywhere. But there are certain problems in this regard due to which it is difficult to go ahead. If you look at the potentials, State-wise, we will find there is a potential of 1400 MW in Arunachal Pradesh, 1600 MW in Uttaranchal, about 2300 MW in Himachal Pradesh and near 1500 MW in Jammu and Kashmir. Thus, there is a potential of approximately 6000 MW in these four States. Presently, the State Government of Arunachal Pradesh is laying emphasis on major hydro projects in the State. You may be aware that they are trying for big hydro projects of about 20-30 thousands MW. For this purpose, they have been making efforts in regard to transmission system as well as evacuation etc. for a number of years. Last year, in Uttaranchal, the State Government had allotted site for approximately 800 MW but later on, the allotment of site was cancelled. Now, a petition has been filed in this regard in the High Court of the State. The case is pending in that court. Unless and until the case is resolved in the court and the State Government allots the site once again, problem will have to be faced in exploiting the potential in Uttaranchal. Discussions are being held with the Government of Himachal Pradesh constantly. They have allotted a number of sites. We hope that potential would be realized in most of the areas in both the plan periods. But, as we move far and far, for example, as we go in Kinnaur, the problems are increasing. It is ecologically a fragile area, it is very far area where there is a problem of roads. Some areas are forest areas. The people there are not in a mood to allow the construction everywhere. Thus, we have set the target keeping in view all the constraints. From our side, this should be the minimum target. It would be our endeavour to achieve more than what target is set. We are holding meetings with every State Government to find out as to what problems they are facing and what kind of help we can provide and how the forest clearance can be obtained in this regard."

1.11 The Committee desired to know about the assessment of resources required and time-frame involved with regard to the realization of identified potential of small hydro power. The Ministry furnished the following information:—

> "The current cost of setting up SHP project ranges from Rs. 6.5 crore to Rs. 7.5 crore per MW. Taking an average cost of Rs. 7 crore per MW, exploitation of remaining 11,000 MW potential would require an investment of Rs. 77,000 crore at the current price level. It is estimated that a time frame of about 15 years may be reasonable in exploiting about 80% of the existing potential. The remaining 20% may not be economically viable or technically feasible or may be falling in forest areas. It may be mentioned that the sites towards the end of potential may be in the far remote areas and may become technically and economically un-exploitable. Such a target would require continued encouragement to the private sector through fiscal and financial support and stable State Government Policies."

1.12 As regard the query about the cost of projects set up by utilizing the renewable energy sources, the Ministry informed as under:—

> The capital investment required for setting up of power projects from renewable energy sources and consequently the economic viability of such projects is highly resource and site specific. It depends on several factors such as the available potential at selected project site, site specific conditions and size of the project. Resource-wise details of capital investment required for setting up renewable energy based power project is as follows:—

Source	Range of capital investment required/MW (Rs. in crore)
Small Hydro Power	6.50 – 7.50
Wind Power	5.50 – 6.00
Biomass Power	4.50 – 5.00
Bagasse Cogeneration	4.50 – 5.00
Solar Power	12.00 – 17.00

1.13 The Committee pointed out at the slow pace of exploitation of small hydro power in the country. The Ministry in a written note summarized their action plan to accelerate the pace as follows:—

> "The Ministry is aiming towards increasing the current rate of capacity addition of 300 MW per year to 500 MW per year in next

2-3 years. The only way to achieve this is through close monitoring of implementation of projects, discussions with the States to streamline procedures, discussions with the transmission corporations in the States to develop systematic plan of evacuation and also to encourage States like Arunachal Pradesh, Chhattisgarh, Jammu and Kashmir, Kerala, Madhya Pradesh and Maharashtra to allot new sites and facilitate SHP developers to take up new projects. There would also be a need for faster exploitation in all Himalayan States."

1.14 The Ministry further Stated that they have considerably stepped up their efforts towards close interaction with the potential States and project-wise monitoring of SHP projects implemented both in public and private sector. Most recently (during October – December 2010) Secretary, MNRE had review meetings with the States of Arunachal Pradesh, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Tamil Nadu and Uttarakhand. Steps necessary for increasing pace of implementation of SHP projects, project-wise monitoring and capacity additions expected during next year and the 12th Plan were the main issues discussed in the meetings.

1.15 Following specific steps have reportedly been identified to achieve increased rate of capacity addition from SHP projects:—

- State-wise identification of projects which are likely to be commissioned during next 2-3 years and the 12th Plan.
- Strengthen monitoring mechanism in every potential State to monitor progress in these projects; identification of problems and redressal mechanism.
- Quarterly review meetings by MNRE with States and SHP developers.
- Project-wise feedback mechanism from the developers.

1.16 Regarding the thrust for development of Small Hydro Power (SHP) potential expected from private sector, the Ministry Stated that with the liberalized policy of the Government announced in 1995, there has been a shift in the State Government policies to exploit small hydro potential through private sector participation. In view of the Electricity Act 2003 and National Electricity Policy 2005, 23 States have announced policies to invite private sector to set up SHP projects. Another reason for this shift is limited availability of financial resources and capacity with the State Governments to set up SHP projects.

1.17 Asked about the role of the private entrepreneurs in capacity addition in realizing the SHP Projects, the Ministry in a note Stated:—

> "The State Governments allot sites to the private sector. After allotment of sites the developers are given specific time for survey, investigation and DPR preparation. The DPR is then examined by the concerned State agencies and techno-economic clearance is given to the developer for setting up the project. They also require local, land or forest clearances. After obtaining statutory clearances etc. they are required to complete the project in a specified time period. The Ministry has been constantly reviewing status with the State Governments along with schedules of implementation of various projects. Based on these it has been inferred that a major part of capacity addition during the 12th Plan would come through private sector SHP projects."

1.18 As regard the role of the Government in helping the private entrepreneurs, the Ministry Stated that the State agencies responsible for development of SHP projects are facilitating SHP developers by way of providing them hydrological information, wherever available and also helping them in obtaining various statutory clearances.

III. 11TH PLAN PERFORMANCE

1.19 According to the Ministry, against a target of capacity addition from SHP Projects of 550 MW during the 10th Plan period, projects with an aggregate capacity of about 537 MW were installed. The total installed capacity of small hydro projects (upto 25 MW) at the end of 10th Plan was 1975 MW.

1.20 The 11th Plan target for small/mini hydro was set as 1400 MW. The target for first three years of the 11th Plan was 750 MW, against which 758.95 MW have been achieved. The details of the year-wise targets and achievements for the 11th Plan as furnished by the Ministry are as follows:—

Year	**Physical**	
	Target (MW)	**Achievement (MW)**
2007-08	200	204.75
2008-09	250	248.93
2009-10	300	305.27
Total in first 3 years of 11th Plan	750	758.95
2010-11	300	114.835 Upto 31.10.2010
2011-12	350	
11th Plan	1400	

1.21 Against the target of capacity addition of 1400 MW for 11th Plan, as on 31st October, 2010, the Ministry could achieve 873.785 MW. On being asked as to how the Ministry are planning to achieve the remaining 526.215 MW capacity by the end of the 11th Plan, the Ministry in a note Stated:—

> "The current year target for SHP is 300 MW, of which 132.10 MW have been achieved up to 30th November 2010. The target for the year 2011-12 is 350 MW. It is expected that both these targets would be achieved. The Ministry is maintaining a list of SHP projects with their expected date of commissioning, based on information received from the States. The position is also periodically reviewed in the meetings with the States and through correspondence with the SHP developers. This monitoring is being strengthened."

1.22 The financial allocation for the small hydro programme for the 11th Plan is Rs. 700 crore. The year-wise details of funds provided

during the current plan period, including funds for the special package for Arunachal Pradesh project *vis-à-vis* expenditure incurred, as furnished by the Ministry are as follows:—

(Rs. in crore)

Year	Financial	
	RE	**Expenditure**
2007-08	50.00	49.95
2008-09	82.50	82.49
2009-10	107.00	106.94
Total in first 3 years of 11th Plan	239.50	239.38
2010-11	152.00	72.89 Upto 31.10.2010

1.23 Against the financial allocation of Rs. 700 crore for the 11th Plan for SHP Programme, the expenditure during the first three and half years (upto 31.10.2010) is Rs. 312.27 crore. When asked as to how the Ministry envisage to utilize the remaining amount of Rs. 387.73 crore by the end of the 11th Plan (*i.e.* by March, 2012), the Ministry in a written reply Stated:—

> "The allocation for a Plan period is an estimation. Budget is given every year as per needs. Expenditure under the programme during the first four years is likely to be about Rs. 390 crore. A financial requirement of Rs. 160 crore has been projected for 2011-12. Thus, the total budget required for the SHP programme during the 11th Plan would be about Rs. 550 crore against an allocation of Rs. 700 crore. It will be possible to achieve the physical targets under the programme with the available budget with some liabilities being spilled over because many SHP projects likely to be commissioned during last year of the 11th Plan, would be eligible for subsidy only in the first year of the 12th Plan."

IV. MICRO HYDEL PROJECTS AND WATER MILLS

1.24 The micro hydel projects and water mills limit of micro hydel projects have the potential to meet the power requirements of remote areas in a decentralized manner. The Ministry have been implementing a scheme to support up-gradation of water mills and micro hydel projects upto 100 KW capacity which are mainly located in remote and rural areas including international border areas. Such projects are benefiting to the local people of such areas in micro-entrepreneur development and socio-economic development by providing illumination/ electrification.

1.25 On a query regarding usage and the benefits of water mills, the Ministry in a note Stated:—

> "Watermills have been traditionally used in hilly regions of India for mechanical applications such as grain grinding, oil extraction, spinning of wool etc. It is estimated that there may be about 50000 – 60000 watermills in the hilly regions. However, the use of watermills is now being marginalized. In 1998-99 the Ministry initiated a project to scientifically design the watermills for mechanical application and for electricity generation. The new designs of these watermills were given to some manufacturers for production. As a result of this project there are about 10 manufacturers which are routinely manufacturing improved designs of watermills for mechanical as well as electricity generation. These watermills have better efficiency, relatively long life and can be used both in mechanical as well as electricity generation mode."

1.26 Regarding status of watermill projects in the country and its progress so far, the Ministry in a note Stated *inter-alia* as under:—

> "So far, 1414 watermills have been installed in the States of Uttarakhand, Jammu and Kashmir, Karnataka, Tamilnadu and Nagaland. A budget of Rs. 15 crore has been provided for supporting watermills and micro hydel projects during the 11th Plan Period.
>
> Major activity of watermill is in the States of Uttarakhand, Jammu and Kashmir, Karnataka and Nagaland. The State of Uttarakhand has a systematic programme of watermills with the involvement of local bodies. They have set up watermill associations in each district. They have also prepared district-wise plans for setting up of watermills. Regular training programmes are being organised at

AHEC, IIT Roorkee for watermill associations. Similarly, the watermill programme has also picked up in Western Ghats of Karnataka and Tamil Nadu."

1.27 On being asked about the utility of watermills in catering the need of electricity in remote areas, the Ministry in a note Stated as under:—

"The electricity generating watermills have proved to be quite useful in providing electricity to the owner of the watermill. In some cases, they have also shared electricity with some more houses. The electricity is also used for providing various services to the villages. However, this has not so far proved to be an effective mechanism for village electrification as the watermill is owned by an individual and its use is by and large limited to his own requirements."

1.28 The Committee also desired to know about the initiatives of the Ministry to develop watermills for communities and villages. The Ministry in a written reply stated that the electricity generation from watermill (gharat) is in the range of 1-5 KW which is not sufficient for meeting requirement of a village/community. However, to meet village/community requirement, the Ministry has a scheme to support micro hydel projects up to a capacity of 100 KW. Over 160 micro hydel projects have been set up in hilly areas and North-Eastern States.

1.29 When the Committee asked about the action plan of the Ministry to promote this sector (watermills) in the country, the Ministry Stated that considering the present level of implementation in the States, a target of 500 watermills per year is being planned. This target can be increased based on requirement from the States. The States have been asked to identify more potential beneficiaries so that pace of implementation can be increased.

1.30 Regarding the financial support being provided for setting up new watermills and micro hydel projects upto 100 KW capacity, the Ministry furnished the following information:—

(i) Micro Hydel Projects upto 100 KW Capacity:

Sl. No.	Areas	Amount of CFA*
1.	International Border Districts	Rs. 1,00,000/- per KW
2.	North Eastern and Special Category States	Rs. 80,000/- per KW
3.	Other States	Rs. 40,000/- per KW

(ii) Watermills:

Sl. No.	Areas	Amount of CFA*
1.	Mechanical output only	Rs. 35,000/- per Watermill
2.	(a) electrical output (upto 5 KW) or, (b) Both mechanical and electrical output (upto 5 KW)	Rs. 1,10,000/- per Watermill

*Central Financial Assistance.

V. FINANCIAL ASSISTANCE SCHEMES

1.31 The MNRE have been providing financial support/subsidy for following activities to develop the SHP sector:—

- Research and Development, Capacity building;
- Resource Assessment, Detailed Survey and Investigation, DPR, preparation and perspective plan for States;
- Capital Subsidy to State Sector Projects;
- Subsidy for Commercial Projects;
- Renovation and Modernization of old SHP Projects (State Sector); and
- Watermills/Micro Hydel Projects.

1.32 Following subsidies are given by the MNRE for SHP Projects:—

(i) Support for Survey, Investigation and Preparation of DPRs for identification of new potential sites:

- Rs. 2.00 lakhs for project upto 1.00 MW capacity; and
- Rs. 5.00 lakhs for project with more than 1.00 MW and upto 25 MW capacity to the Government departments/ agencies.

(ii) Support to new SHP Projects in State Sector:

Category	**Above 100 KW and upto 1000 KW**	**Above 1 MW – 25 MW**
Special category and NE States	Rs. 50,000/KW	Rs. 5.00 crore for first MW + Rs. 50 lakh/MW for each additional MW
Other States	Rs. 25,000/KW	Rs. 2.50 crore for first MW + Rs. 40 lakh/MW for each additional MW

- Minimum of 10% contribution of the project cost from the implementing organization.
- The subsidy would be released in four instalments based on progress in the project.

(iii) Support to new SHP Projects in Private/Co-operative/Joint Sector:

Category	upto 1000 KW	Above 1 MW – 25 MW
Special category and NE States	Rs. 20,000/KW	Rs. 2.00 crore for first MW+Rs. 30 lakh/MW for each additional MW
Other States	Rs. 12,000/KW	Rs. 1.20 crore for first MW+Rs. 20 lakh/MW for each additional MW

- Minimum of 50% contribution of the project cost from the project developer/owner of the project.
- The subsidy would be released in two instalments. 50% subsidy will to be released to the financial institution, during execution of the project (after placement of order for electro-mechanical equipment and 50% loan disbursement) and balance after performance testing.

(iv) Scheme to support Renovation and Modernization of old SHP Projects in public sector:

Category	upto 1000 KW	Above 1 MW – 25 MW
Special category and NE States	Rs. 25,000/KW	Rs. 2.50 crore for first MW+Rs. 50 lakh/MW for each additional MW
Other States	Rs. 15,000/KW	Rs. 1.50 crore for first MW+Rs. 35 lakh/MW for each additional MW

- Minimum of 50% contribution of the project cost from the State sector project implementing organization of the works.
- The subsidy would be released in 3 instalments based on progress in the project.

1.33 On being asked about the loan and Grants-in-aid component of the Central Financial Assistance provided to State Governments and private sector, the Ministry Stated:—

"MNRE's Central Financial Assistance (CFA) is given as Grant-in-aid, to both State Government as well as private sector. The CFA is released in four instalments for the State sector projects linked to physical progress in the project. For private sector projects, subsidy is released in two instalments of 50% each. The first

instalment is released after achieving 50% physical and financial progress in the project against bank guarantee. The second instalment is released after completion of project and its performance testing by AHEC, IIT Roorkee. The subsidy for private sector project is released to financial institution, which has provided loan for the project, to reduce the loan."

1.34 When asked about the financial institutions providing loans to private developers for small and mini hydel projects and their terms and conditions, the Ministry in a written reply stated as under:—

"IREDA, PFC, REC and a large number of banks provide loan for SHP projects. These institutions/banks have their own appraisal mechanism and terms and conditions for providing the loan. This also depends on viability of the project and expected rate of return. Most of the FIs provide loan up to 70% of the project cost and the rate of interest varies from 10.5% to 12% depending upon size and location of the project."

1.35 To a query on the role of IREDA in the development of small and mini hydel projects during the 11th Plan period, the Ministry furnished the following information:—

"As a financial institution IREDA has been playing pivotal role in development of Small Hydro Projects. It provides only loan for SHP projects. Year-wise, number of projects and loan sanctioned by IREDA during the 11th Plan, disbursements made, number of projects commissioned are as under:—

Year	No. of Projects Sanctioned	Sanction Amount (Rs. in crore)	Disburse-ment (Rs. in crore)	No. of Projects Commiss-ioned	Capacity Commiss-ioned (in MW)
2007-08	7	226.23	119.39	2	5.75
2008-09	12	343.40	147.55	6	52.1
2009-10	10	483.45	229.03	4	15
2010-11 (till 31.12. 2010)	7	874.65	170.57	1	5
Total	**36**	**1927.73**	**666.54**	**13**	**77.85**

A capacity of another 50 MW is likely to be commissioned during remaining period of 11th plan."

VI. POLICIES AND ISSUES RELATED WITH DEVELOPMENT OF SHP PROJECTS

1.36 The policy for Small Hydro Power and private sector participation therein, is governed by the Electricity Act, 2003, the National Electricity Policy, 2005 and Tariff Policy, 2006 announced by the Government of India. Power being a concurrent subject, 23 State Governments have so far announced policy for private sector participation for the development of SHP projects. The State Electricity Regulatory Commissions (SERCs) have been deciding tariff in their respective States. These States are Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Gujarat, Haryana, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, Uttaranchal and West Bengal. CERC has issued guidelines to determine tariff for all renewable energy technologies including small hydro projects.

1.37 It has been reported that so far, 249 private sector SHP projects with an aggregate capacity of 1268 MW have been set up. The State-wise details as provided by MNRE are as follows:—

Sl. No.	State	Total Number	Total Capacity (MW)
1.	Andhra Pradesh	43	104.43
2.	Assam	1	0.10
3.	Gujarat	2	5.6
4.	Himachal Pradesh	58	252.45
5.	Haryana	2	7.4
6.	Jammu and Kashmir	2	17.5
7.	Karnataka	91	675.10
8.	Kerala	2	33.00
9.	Madhya Pradesh	1	2.20
10.	Maharashtra	11	63.50
11.	Orissa	2	32.00
12.	Punjab	18	26.20
13.	Tamil Nadu	1	0.35
14.	Uttaranchal	10	48.30
15.	West Bengal	5	6.45

1.38 The Committee desired to know the reasons as to why some of the States have not announced policy so far for private sector participation and how it will affect the development of SHP projects in those States. The Ministry in a reply Stated as under:—

"Most States have already announced policy for inviting private sector to set up SHP projects. The States, who have not announced the policy are Goa, Jharkhand, Nagaland, Sikkim and Tripura. The potential of SHP in these States are as follows:

Sl. No.	State	Potential		Projects Installed	
		Nos.	Total Capacity (MW)	Nos.	Capacity (MW)
1.	Goa	6	6.5	1	0.05
2.	Jharkhand	103	208.95	6	4.05
3.	Nagaland	99	188.98	10	28.67
4.	Sikkim	91	265.55	16	47.11
5.	Tripura	13	46.86	3	16.01

It may be seen from the above table that Goa and Tripura have negligible potential. Nagaland has no programme to further develop small hydro as they are getting enough power from the central sector projects. The State of Sikkim has allotted a number of medium and large size hydro projects to the private sector through MOU route. The State has decided that small hydro projects will be developed by State Power Development Corporation. The absence of State policy may not have serious effect on overall development of SHP in the country."

1.39 On a query as to whether any State policy stands in the way for development of SHP Projects, the Ministry informed that in some States, tariff fixation and third party sale of power were the issues. These have been addressed in the past few years by the respective States and also by the tariff guidelines issued by CERC for small hydro projects and there are no major State policy issues.

1.40 Regarding efforts of the Ministry in dealing with the State issue, the Secretary, MNRE, during the evidence held on 12th January, 2011 deposed as under:—

"During our recent visit to Karnataka, we held a meeting with forest officers and developers to know about the difficulties being faced by them so that the requests for the approval may be processed

quickly. We are trying to achieve the targets of 2000 and 3000 MW fixed for us for the next two five-year plans. The potential exists for 15000 mega watt but this can never be realized as theoretically everything is included in it. For example, huge potential exists in the canal and efforts are being made in this direction. They are inviting expression of interest in canal in order to invest as much money as possible in this area. Three days ago, the Chief Minister and our hon'ble Minister conducted review in respect of Nagaland and Jammu and Kashmir Hydro-power sector was also reviewed. Their policy formulation was not complete at that point of time. The policy has been under formulation since the last one year. Now, they have said that they will announce the policy next month. Thereafter, they will hold a meeting with the developers. Transmission network will also be required, though these will be needed only for small hydro project, as the project sites are located in the far-flung areas. All the relevant aspects such as developing transmission system their cost and methodology of cost bearing on the part of the State are required to be considered. We are trying to chalk out a transmission requirement plan in consultation with every State. We have this is our plan for this year."

1.41 When asked about the impact of small hydel projects on environment, the Ministry informed as under:—

"Setting up of SHP projects do have some impact on environment as these projects interact with water and land. However, their environmental effect is minimal in comparison to large hydro power projects. There are no issues like population displacement, re-habilitation, construction of dam, submergence etc. associated with SHP. SHP projects are normally set up in hilly areas. The land required to set up project may have some trees or forest cover. Hence, the project would require compulsory afforestation and forest clearance. Water of the river/canal is also diverted for a limited distance to generate the power and hence this may also have some impact on the environment. Aquatic life (fish etc.) may also have some impact of the project. This apart, the activity during construction of the SHP project would also have impact on the environment".

1.42 The Committee enquired about the issues/objections raised by local communities in setting up small hydro power projects and remedial action taken thereupon. The Ministry in a written reply Stated:—

"Sometimes SHP developers do face objections from the local community. Normally, the issues relate to land, employment of

local people and contribution towards local area development. To address these issues State Governments have specific provisions in their policies. For example: the State of Himachal Pradesh require 1% of the project cost to be deposited by the developer for local area development. This apart the SHP developer also engages local residents during construction of the project and as their employees. By and large the issues are resolved by the developers with the help of local Panchayat/Government Officials. These are local issues which have to be addressed by the State Government".

1.43 The main obstacles faced by private sector participants with regard to development of SHP projects, as informed by the Ministry are as under:—

"Time taken in obtaining various clearances at the State level, transfer of land, forest clearance, availability of reliable hydrological data, timely creation of suitable power evacuation facilities are the main issues which require streamlining and attention of the State Government for faster development of SHP projects."

1.44 Regarding environment and forest clearances, the Ministry replied as under:—

"It is necessary to take environment and forest clearances for setting up of SHP projects. It is important to make correct assessment of environmental effect of the project. While these clearances are normally given for SHP projects, there is a procedure to obtain these clearances and it may take about 6-8 months to obtain forest clearance. It may be mentioned here that the developer is required to deposit fee for compensatory afforestation in case forest land is associated with the project. In the review meetings with the States, Ministry has been urging time bound clearances. It has also been suggested that the Forest and revenue departments should designate Nodal officers to deal exclusively with renewable energy projects".

1.45 The Ministry further added:—

"There has been continuous growth in the SHP sector. During the 9th Plan a capacity of 269 MW was added. This has increased to 536 MW during the 10th Plan and it is expected that it would reach 1400 MW during the 11th Plan. The average capacity addition of 55 MW per year during the 9th Plan has increased to 270 MW per year during the 11th Plan. It is difficult to set up SHP projects as the sites are normally located in remote and inaccessible areas.

Implementation of the project takes 4-5 years. Since now most of the projects are being set up by number of private developers simultaneously, the growth is expected to be faster. However, in some cases, the private developers to whom the project is allotted, finds it difficult to mobilize equity contribution and implementation gets delayed."

1.46 Regarding delay in implementation of the projects, the Secretary, MNRE during evidence Stated as under:—

"…I emphasise it to the States that the time of six years taken by them is a very long time. I emphasize it to the States why do they not conduct survey in time? It has been the policy of States to make allotment in the self-identified site and then they collect data of two years. Thus, two years elapse in this very work. They prepare their project on this basis for which technical and economical clearances are given either by the State Electricity Board or by the State Authority. Again this is delayed by one year. Thereafter, environmental clearance is required to be taken if the site is found to be exact. If the land belongs to any private individual or to Government, then that land is also required to be obtained. All these formalities are time consuming. Thereafter, construction is started which normally takes two to three years to be completed. We are trying to say to them that they should try to complete the process of survey, data collection and TEC clearances in six months…".

VII. ELECTRIFICATION/ILLUMINATION OF BORDER VILLAGES OF ARUNACHAL PRADESH

1.47 The Prime Minister during his visit to Arunachal Pradesh on 31st January–1st February, 2008 had announced a package of Rs. 550 crore to provide electricity/illumination through solar power as well as small hydro power projects to all the villages along the State border. As per the MNRE, a plan was accordingly drawn up to electrify/illuminate 1483 unelectrified villages of all border districts of Arunachal Pradesh. 425 villages are proposed to be electrified through 46 small hydro power projects being implemented by the Government of Arunachal Pradesh. For these projects a sum of Rs. 274.42 has been provided by the Planning Commission to the State.

1.48 A project for electrification/illumination of the balance 1058 villages from small/micro hydel projects and solar photovoltaic systems with an estimated cost of Rs. 275.58 crore was developed by the MNRE in consultation with the State Government. The project was reportedly approved by CCEA on 20th November, 2008. A Steering Committee under the Chairmanship of the Secretary, MNRE has been set up to oversee implementation of the project. MNRE has informed that four meetings of the Steering Committee have been held. Already 610 villages have been illuminated by SPV systems and small/micro hydel projects. The remaining villages are targeted to be electrified by 31st December, 2011.

1.49 When the Committee enquired about the number of villages to be electrified through small hydel projects as against through other mode/technology, the Ministry Stated that out of 1058 villages, 523 villages have been illuminated with solar photovoltaic home lighting systems. The balance 535 is being electrified from small/micro hydel projects. These are as envisaged in the project.

1.50 The Committee found that against the total target of 1483 unelectrified villages of all border districts of Arunachal Pradesh, as on December, 2010, only 610 villages were illuminated and asked the Ministry to explain the action plan of the Government to illuminate/electrify the remaining 873 villages by the targeted time schedule of December, 2011. The Ministry in a note replied as under:—

> "The Arunachal Pradesh project envisages electrification/ illumination of 1483 villages of border districts of Arunachal Pradesh with a total cost of Rs. 550 crore. The project has two parts:
>
> Part 'A' involves completion of 46 ongoing SHP projects being implemented by Department of Hydro Power Development

(DHPD), Government of Arunachal Pradesh. The benefit of electricity from these projects would flow to about 776 villages including 425 unelectrified villages. Funds for these projects have been directly given by the Planning Commission to the State Government and the projects are monitored by them. For these projects a sum of Rs. 274.42 have been provided by the Planning Commission to the State. It is reported that 32 projects out of 46 ongoing projects have been completed giving benefit to 547 villages including 336 unelectrified villages.

The project with which MNRE is concerned relates only to Part 'B' of the project which involves electrification/illumination of balance 1058 villages at a total cost of Rs. 275.58 crore. Out of 1058 villages, 523 villages have been illuminated by SPV home lighting systems and 203 villages have been electrified from SHP projects (Total 726 villages) as on 30th November, 2010. Balance projects have to be completed by December 2011. Progress is being monitored regularly. These are all projects to be implemented in difficult terrains. There has also been rain during many months of this year which has created some problem. Therefore, some projects may take longer to implement."

1.51 Regarding fund utilization on this project, the Ministry Stated as under:—

"Out of total Rs. 550 crore, the Planning Commission has already released full amount of Rs. 274.42 crore to Government of Arunachal Pradesh for Part A of the project. For Part B, the Ministry has released Rs. 108.21 crore to DHPD, APEDA, Deptt. of Power and AHEC. In total, so far a sum of Rs. 382.63 crore has been released and about Rs. 30 crore more are proposed to be released by March, 2011."

1.52 In reply to a query of the Committee, the Ministry Stated that the budget provision was adequate to achieve the targets.

1.53 As regard the main hurdles faced by the implementing agencies under this project, the Ministry Stated as under:—

"The year 2010 has been of excessive rain in Arunachal Pradesh. This has seriously affected progress in some of the projects. Long distances and connectivity is the main hurdle in execution of projects on border areas. There are some projects which require walking of 3-4 days. Carrying construction material and heavy equipment is a challenge at these sites."

VIII. TECHNICAL INSTITUTIONS FOR DEVELOPMENT OF SMALL HYDRO POWER

1.54 Alternate Hydro Energy Centre (AHEC) at IIT, Roorkee is the leading technical Centre for small hydro in the country. It was established in the year 1982 with initial sponsorship of Ministry of New and Renewable Energy. According to the MNRE, AHEC has been providing professional support in the field of Small Hydropower Development covering planning, Detailed Project Reports (DPRs), Detailed Engineering Designs and Construction Drawings, Technical Specifications of Turn Key Execution/Equipment Supply, Renovation and Modernisation of SHP Stations, and Techno-Economic Appraisal. Technical support to over 25 different States and Central Government organizations for SHP development has been provided. IPPs and financial institutions are utilizing its expertise support for their SHP development. Data Bank for small hydro projects is the unique facility created at AHEC. AHEC has developed two designs of water mills for grains grinding and for mechanical/electricity generation purpose for the hilly region of the country.

1.55 Besides, AHEC has been imparting training to the field engineers and technologists through short-term training courses. It is reported that AHEC offers a four semester Master of Technology (M.Tech.) programme in "Alternate Hydro Energy Systems". A real time digital simulator for small hydropower plants, has been established with the support from the Ministry for providing efficient initial and advanced training to operators and engineering staff of different types of small hydroelectric plants. Standards, manuals and guidelines for various aspects of small hydropower development are being prepared by AHEC through consultative process with the sponsorship of MNRE. A project to set up a small hydro hydraulic turbine R&D laboratory at AHEC with an objective of creating international level facilities for testing, design and R&D in the area of hydraulic turbines, hydro mechanical equipments, control and instrumentation of small hydro electric power plants have been sanctioned.

1.56 The Committee wanted to know whether Alternative Hydro Energy Centre (AHEC) at IIT, Roorkee is the only institute in the country providing professional support in the field of small hydro power. The Ministry in a note informed:—

> "Alternate Hydro Energy Centre (AHEC) IIT, Roorkee is the lead technical centre for small hydro. It has collaboration with Jadavpur University, Kolkata, National Institute of Technology, Bhopal and other technical/engineering institutions. It has been providing professional support covering planning, detailed project reports,

detailed engineering designs and construction drawings, technical specifications for turnkey execution/equipment supply, and techno-economic appraisals. There are a large number of technical and professional private organizations in the country providing consultancy on all aspects of small hydro. Almost all private developers are appointing private consultants and contractors for survey, DPR preparation and execution of projects. They consult AHEC as and when required."

1.57 To a query regarding technical and institutional capabilities developed by AHEC for designing, erecting and commissioning of small hydro projects in the country, the Ministry in a note replied as under:—

"AHEC is not involved in the erection and commissioning of SHP projects. It provides only technical consultancy and has full capabilities of designing projects. It concentrates more on training and human resource development. It also acts as independent agency for testing the performance of small hydro projects. Data Bank for small hydro projects is the unique facility created at AHEC. AHEC offers a four semester Master of Technology (M.Tech.) programme in "Alternate Hydro Energy Systems". A real time digital simulator for small hydropower plants, has been established for providing initial and advanced training to operators and engineering staff of different types of small hydro plants."

1.58 Regarding the Research and Development (R&D) efforts undertaken by AHEC for development of SHP, the Ministry Stated:—

"At present, AHEC is working on the preparation of Standards, manuals and guidelines for various aspects of small hydropower development. These are being developed through a consultative process with experts and consultants. These will help in achieving better reliability and cost effectiveness in the projects. The Ministry has recently sanctioned a project to set up a small hydro hydraulic turbine R&D laboratory with an objective of creating international level facilities for testing, design and R&D in the area of hydraulic turbines, hydro mechanical equipments, control and instrumentation of small hydro plants. Technical details and design of the laboratory has been finalized and it will be ready in two years."

1.59 When asked about the efforts of the MNRE to develop expertise in small hydro projects in universities/technical institutes like IITs, etc. especially in the North-Eastern Region of the country which abounds in hydro power potential, the Ministry in a note stated as under:—

"AHEC, IIT, Roorkee has been developed as the lead institute specialising in small hydro catering to almost all technical needs

of the country in this area. However, there are several other technical institutes who are working in the same area. Some of these are:—

- Maulana Azad National Institute of Technology, Bhopal
- Jadavpur University, Kolkata
- Dr. Bhim Rao Ambedkar National Institute of Technology, Jalandhar
- National Institute of Technology, Hamirpur
- National Institute of Technology, Srinagar
- North-Eastern Regional Institute of Science and Technology, Itanagar

Beside these technical institutions some Polytechnics and ITIs are also working in this area. AHEC at IIT, Roorkee works in close network with many of the above-said institutions and they take part in several activities together."

PART II

OBSERVATIONS/RECOMMENDATIONS

Small/Mini Hydel potential

The Committee note that the estimated potential for power generation in the country from small hydel projects (upto 25 MW capacity) is 15384 MW from 5718 identified sites, whereas, as on 31st December, 2010, 2939 MW capacity has been set up in various parts of the country and projects of about 927 MW are in various stages of implementation. The Committee are surprised to find that only 19 per cent of the identified potential in the country has been exploited so far. The Government's approach has not been very aggressive in this arena as is evident from the fact that very moderate targets were set for the 9th, 10th and 11th Five Year Plans. Even though the targets set have been achieved in 9th and 10th Plans and are likely to be achieved in 11th Plan, the fact remains that huge potential is still left untapped in most of the potential States making the task of the Ministry challenging in the coming years. Even if the projected figure of 8500 MW of cumulative capacity of SHP projects by the end of the year 2021-22 is at all to be believed, the total installed capacity would be about 55 per cent of the identified potential. This percentage may come down substantially as more potential sites may be identified by the year 2021-22 *i.e.* the completion year of the 13th Plan. Scrutiny of the State-wise data reveals that the performance in the States with maximum potential has been far from satisfactory. About 6500 MW potential is available in the four States only *viz.* about 1400 MW in Arunachal Pradesh, 1600 MW in Uttarakhand, 2300 MW in Himachal Pradesh and 1500 MW in Jammu and Kashmir. However, merely 711.67 MW capacity has so far been installed and 413.47 MW capacity projects are at various stages of implementation in these States. Another disquieting fact is that the installed capacity is a meager 78.84 MW against the total potential capacity of 1328.68 MW available in the State of Arunachal Pradesh, which makes around 6 per cent of the available potential. This sorry State of affairs is not at all acceptable to the Committee moreso when the State is getting special funds under the Prime Minister Border Village Illumination Scheme. The Committee also take note of the targets of 2000 MW and 3000 MW fixed for the 12th Plan and 13th Plan respectively. While acknowledging the efforts made by the

Ministry in mitigating the problems like allotment of sites, approaching path in forest areas, local nuances, etc., the Committee feel that this is high time for the Ministry to work on reducing the reported gestation period of 4-5 years in order to ensure increased pace of implementation of the SHP Projects. Against this backdrop, the Committee recommend the Ministry to come out with a concrete plan of action to exploit the huge untapped potential at faster pace, especially in the States with maximum potential.

(Recommendation Sl. No. 1, Para No. 2.1)

2.2 The Committee find that the last survey to identify the potential availability in hydro sector (above 3 MW) in the country was conducted by the Central Electricity Authority during 1978 to 1987. The MNRE might have revised the data slightly by adding a few more SHP potential sites identified over the years, especially of micro/mini capacity, but the Committee are not very sure whether the MNRE have conducted any independent survey to update the availability of SHP potential sites in the country. Though there are about 5,700 identified potential sites in the country out of which more than 4,500 sites are still available for exploitation, the Committee feel that with the growing need, advancements in technology, experience gained in SHP sector and other related factors, there is dire need to review the SHP potential statistics, which is about two and half decade old. The Committee, therefore, recommend that the Ministry should take initiative for a fresh look on the potential availability of SHP projects in the country in coordination with the Ministry of Power. This will help the Ministry in reframing their targets/programmes for the future plans *viz* 12th and 13th Five Year Plans. This would also help the Government in revising/ reviewing the existing policy for development of SHPs.

(Recommendation Sl. No. 2, Para No. 2.2)

11th Five Year Plan performance

2.3 The Committee observe that against the target of capacity addition of 1400 MW for 11th Plan, as on 31st October, 2010, only 873.78 MW *i.e.* 62 per cent of the targeted capacity has been achieved. To achieve the remaining target of 526.215 MW capacity in less than one and half years, the Ministry have informed that they are reviewing the progress periodically through meetings with the States and correspondence with the SHP developers. Though the physical achievement during the first three years have been at par with the targets set by the Ministry, the Committee find that the achievement during the penultimate year of the 11th Plan is not upto the mark as only 114.835 capacity against the target of 300 MW (forming only 38 per cent of the target) has been achieved in the first seven months

of 2010-11 leaving a daunting task ahead to achieve about 38 per cent of the total target of the 11th Plan in less than one and half years. The details of the financial allocation *vis-à-vis* expenditure made during the Plan, as provided by the MNRE, clearly show that the Ministry have been able to meet the financial requirements quite conveniently. Moreover, the assessment of the Ministry that the total budget requirement for the SHP programme during the 11th Plan would be about Rs. 550 crore against the allocation of Rs. 700 crore itself indicate that there is no dearth of funds for the SHP programme. However, keeping in view the performance shown so far during the current Plan period, the Committee feel that the task ahead for the Government may not be impossible, but is certainly challenging and the Ministry do not have any other option but to tighten their monitoring and coordination mechanism in order to get the desired results from the developers and the States. No doubt, a cohesive, well coordinated and dynamic management would be required to achieve the objectives. The Committee, therefore, recommend that single window system may be encouraged in States for all the clearances including DPR, techno-economic, local land and/or forest clearances and monitoring. This will not only help the Government in accelerating the pace of implementation of the programme but also ensure the full achievement of the targets of 11th Plan and subsequent plans as well.

(Recommendation Sl. No. 3, Para No. 2.3)

2.4 While examining the data relating to sanction *vis-à-vis* disbursement of loans by IREDA to SHP projects during 11th Plan period, the Committee are astonished to note the huge mismatch between the capacity commissioned and amount disbursed in the implementation of the small hydro projects. In the year 2008-09, Rs. 147.55 crore were disbursed for capacity commissioning of 52.1 MW while in the year 2009-10, Rs. 229.03 crore were disbursed for capacity commissioning of 15 MW. Similarly, Rs. 170.57 crore were disbursed till 31st December, 2010 and only 5 MW could be commissioned during 2010-11. There seems to be great mismatch between the capacity attained and money released as there cannot be any justification whatsoever of such a huge disparity and unevenness with regard to the expenditure incurred *vis-à-vis* capacity addition. The Committee, therefore, strongly recommend that the causes should be analysed and reasons found out for this anomaly and simultaneously efforts, both technological as well as administrative, should be made to ensure that expenditure per MW capacity addition remains similar to the extent possible.

(Recommendation Sl. No. 4, Para No. 2.4)

Micro Hydel Projects and Water Mills

2.5 The Committee find that there is ample scope of installation of micro hydel projects upto 100 KW capacity and water mills of smaller capacities of the range of 1-5 KW to meet the power requirements of remote areas, particularly hilly and mountain areas in a decentralized manner. The MNRE have informed that they are extending Central Financial Assistance (CFA) ranging from Rs. 35,000/- to Rs. 1,10,000/- per watermill and Rs. 40,000/- to Rs. 1,00,000/- per KW per micro hydel project. It is also informed that a budget of Rs. 15 crore has been provided for supporting watermills and micro hydel projects during the 11th Plan period. The Committee do appreciate the steps taken by the Ministry to promote production of scientifically improved designs of the watermills with better efficiency, longer life and diversified uses. At the same time, the Committee suggest that the cost of installation of improved designs of watermills and CFA be managed in a pragmatic manner keeping in mind the affordability of the end-users. Besides, the production of the improved version of watermills in a large scale may also be linked with their maintenance so that the spare parts and technical/mechanical services are easily available at reasonable cost.

(Recommendation Sl. No. 5, Para No. 2.5)

2.6 The watermills may be used by the individuals in remote areas due to their limited capacity, yet the Committee feel that the mechanical and electrical uses of the watermills and their socio-economic value make them a significant tool in enhancement of the economic activities and betterment of the opportunities of livelihood for the people of remote and unaccessible areas where grid connectivity is not feasible. The Committee, therefore, recommend that the promotional programme of watermills in a largescale be spread and implemented in potential areas on the pattern of Uttarakhand by involving local bodies, associations and arranging suitable training programmes at the Centres like AHEC and IITs.

(Recommendation Sl. No. 6, Para No. 2.6)

Financial Assistance

2.7 The Committee find that to develop the SHP sector, the Ministry of New and Renewable Energy have been providing financial support/subsidy for the activities related with Research and Development, capacity building, Resource Assessment, Detailed survey and investigation, DPR preparation and perspective plan for States, capital subsidy to State sector projects, subsidy for commercial projects,

Renovation and modernization of old SHP projects (State Sector) and water mills/micro hydel projects. The Committee are given to understand that the financial assistance is given as grant-in-aid to both State Governments as well as private sector. The Committee also note that some of the Central financial institutions *viz*, IREDA, PFC, REC and a large number of banks are also providing loan for SHP projects and IREDA in particular has a pivotal role in development of small hydro projects in terms of financing. The Committee are aware that the cost for setting up SHP projects ranges from Rs. 6.5 crore to Rs. 7.5 crore per MW and the Government is providing sufficient financial assistance in the North-Eastern States, other States and Private entrepreneurs etc., to boost the sector. Considering the huge gap in the potential and the achieved installed capacity, present level of targets in this regard for achievement are not very enthusiastic. The Committee, therefore, recommend that all out efforts should be made to woo the entrepreneurs especially from local areas highlighting the subsidy component, the other entailed benefits and resultant welfare of the local people.

(Recommendation Sl. No. 7, Para No. 2.7)

Arrangements of Finances to promote SHP sector

2.8 The Committee note that a sizeable amount of the costs of SHP is being given as grant-in-aid by the Ministry to the State Governments as well as to the private sector. Despite this, funds are required to complete the projects. The Committee note that IREDA, PFC, REC and large number of Banks provide loans to SHP projects as per their own parameters and procedures. IREDA being the only specialized PSU under the Ministry of New and Renewable Energy which provide funds for promotion and development of new and renewable sources of energy, has major responsibility in the development of SHP projects. However, during the last four years (upto 31.12.2010), IREDA could disburse only Rs. 666.54 crore against the sanctioned amount of Rs. 1927.73 crore *i.e*. only 35 per cent of the sanctioned amount. No figures are available with regard to the loan sanctioned and disbursed by PFC, REC and other Banks. The Committee, therefore, recommend that power sector financial institutions like IREDA, PFC, RECs etc. should initiate sincere efforts in ensuring that no SHP project is withheld for want of finance. Besides, there should be element of healthy competition within Central agencies for promoting the sector by arranging necessary funds. The Committee also recommend the Ministry to be more proactive and act as a facilitator between the financial institutions and the implementing agencies.

(Recommendation Sl. No. 8, Para No. 2.8)

Policies and Issues

2.9 The Committee note that the policy for Small Hydro Power and private sector participation therein, is governed by the Electricity Act, 2003, the National Electricity Policy, 2005 and Tariff Policy, 2006 announced by the Government of India. 23 State Governments have so far announced policy for private sector participation for the development of SHP projects. Also, the State Electricity Regulatory Commissions (SERCs) have been deciding tariff in their respective States. While examining the data provided by the Ministry, the Committee find that an aggregate capacity of 1268 MW have been set up so far by private sector through 249 projects in 15 States. The Committee are astonished to observe that there is no mention of the State of Arunachal Pradesh, one of the greatest potential States in SHP, in the list and that in Jammu and Kashmir, which has the third largest potential (*i.e.* 1417.80 MW), only two projects of 17.5 MW have been developed by the private sector. The situation is not encouraging in other potential States too. The Committee also find that the States of Arunachal Pradesh, Himachal Pradesh, Jammu and Kashmir and Uttarakhand, which are the States with maximum SHP potential (about 42 per cent of the total SHP potential in the country), are among those States which have already announced policy for private sector participation for development of SHP projects. The Committee feel that in the wake of the State policy on private participation and CERC/ SERC guidelines on tariff, the Government should play a catalytic role in increasing the involvement of private sector in the development of SHP sector in different States, particularly the high potential States. The Committee, therefore, recommend that the Government should come out with a concrete plan of action in this regard and inform the Committee about the steps taken to promote and encourage private sector participation in SHP projects in various States.

(Recommendation Sl. No. 9, Para No. 2.9)

2.10 The Committee note that the SHP developers do face objections from the local community on the issues relating to land, employment of local people and contribution towards local area development. Other obstacles faced by the private developers reportedly include time taken in obtaining various clearances at the State level, transfer of land, environment and forest clearance, availability of reliable hydrological data, timely creation of suitable power evacuation facilities, deposit of fee for compensatory afforestation etc. The Committee feel that the obstacles highlighted by the Ministry are basically administrative in nature and are not unforeseen. Since the

State Governments have their own mechanism to address these administrative issues, the Committee feel that consistent and sincere efforts of the Ministry in assisting and mobilizing the State Governments would lessen the time taken in obtaining various clearances culminating into faster implementation of the projects. More so as the SHP projects do not encounter major and sensitive issues like population displacement, rehabilitation, construction of dam, submergence etc., which generally take longer time to address. The Committee, therefore, recommend the Ministry to persuade, encourage and motivate the States and private developers to complete the process of survey, data collection and other clearances like technical and economic, forest and environment clearances in a minimum time period so as to curtail avoidable delays in implementation of the SHP Projects.

(Recommendation Sl. No. 10, Para No. 2.10)

Electrification/illumination of border villages of Arunachal Pradesh

2.11 The Committee find that the Prime Minister during his visit to Arunachal Pradesh on 31st January-1st February, 2008 had announced a package of Rs. 550 crore for illumination/electrification of 1483 un-electrified villages along the State border through solar power and small hydro power. The Committee note that out of 1483 un-electrified villages, 425 villages are proposed to be electrified by the Government of Arunachal Pradesh and the balance of 1058 villages were to be electrified through small/micro hydel projects and solar photovoltaic systems with an estimated cost of Rs. 275.58 crore by the Ministry of New and Renewable Energy in consultation with the State Government. The Committee find that as on 30th November, 2010, out of 1058 villages under MNRE programme, 523 villages have been illuminated by SPV systems and 203 villages have been electrified through SHP projects. The Committee have been assured that illumination of rest of the 332 villages will be completed through SHP projects by December, 2011. On financial aspect, the Committee have been informed that out of total amount of Rs. 550 crore allocated for the scheme, the full amount of Rs. 274.42 crore have already been released to Government of Arunachal Pradesh for their part of the Scheme. A balance of Rs. 275.58 crore were to be utilized by the MNRE, against which they have released Rs. 108.21 crore (about 39.26 per cent) so far. The Ministry considers the budget provision for the project adequate to achieve the target. The Committee observe that the scheme was announced way back in the beginning of the year 2008 and the performance shown

by the Ministry so far indicate that it would not be easy for them to complete illumination of the balance of 332 villages through SHP Projects and to achieve the full target by the end of the year 2011. Though excessive rain, long distances and connectivity have been highlighted as the main hurdles faced by the developers, the Committee feel that the reported hurdles are not uncommon in a State like Arunachal Pradesh and could be tackled by proper planning, monitoring and concerted efforts on the part of the Government. The Committee, therefore, recommend the Ministry to accelerate the pace of implementation by evolving proper coordination mechanism with the State Government so that targets are converted into result.

(Recommendation Sl. No. 11, Para No. 2.11)

Technical institutions for development of Small Hydro Power

2.12 The Committee note that Alternate Hydro Energy Centre (AHEC) at IIT, Roorkee has been providing professional support in the field of small hydro power development covering planning, detailed project reports, detailed engineering designs and construction drawings, technical specialization of turn key execution/equipment supply, renovation and modernization of SHP stations, and Techno-economic appraisal. Besides imparting training to the field engineers and technologists through short-term training course, the Committee have been informed that AHEC offers Master of Technology (M.Tech) programme in 'Alternate Hydro Energy Systems' and advanced training to operators and engineering staff of different types of small hydroelectric plants. The Committee have been informed that standards, manuals and guidelines for various aspects of small hydro power development are being prepared by AHEC through consultative process with the sponsorship of MNRE and a project to set up a small hydro hydraulic turbine R&D laboratory at AHEC with an objective of creating international level facilities for testing, design and R&D in the area of hydraulic turbines, hydro mechanical equipments, control and instrumentation of small hydro electric power plants have been sanctioned. While taking note of the role AHEC has played so far in their plans of technological advancement for the development of the sector, the Committee feel that much could have been done earlier for the development of small hydro technology in the country. Other centres like NITs at Hamirpur and Srinagar and technical institutions elsewhere in the country have also very little to show as their achievement. The Committee would therefore recommend that AHEC, IIT, Roorkee should

work as a premier institution in the development of small hydro technology in the country paving the way for economic and efficient development of the technology and be a torch bearer for other technological institutes. The Committee also recommend that the Ministry should strengthen the AHEC and provide all support in encouraging it to boost the research and development activities in the small hydro sector.

(Recommendation Sl. No. 12, Para No. 2.12)

NEW DELHI;
08 *March,* 2011
17 *Phalguna,* 1932 *(Saka)*

MULAYAM SINGH YADAV,
Chairman,
Standing Committee on Energy.

ANNEXURE I

MINUTES OF THE SIXTH SITTING OF THE STANDING COMMITTEE ON ENERGY (2010-11) HELD ON 12TH JANUARY, 2011 IN COMMITTEE ROOM '62' PARLIAMENT HOUSE, NEW DELHI

The Committee sat from 1100 hrs. to 1230 hrs.

PRESENT

Shri Mulayam Singh Yadav — *Chairman*

MEMBERS

Lok Sabha

2. Shri Mohammad Azharuddin
3. Shri P.C. Chacko
4. Shri Paban Singh Ghatowar
5. Shri Chandrakant Bhaurao Khaire
6. Shri Shripad Yesso Naik
7. Shri Nityananda Pradhan
8. Shri M.B. Rajesh
9. Dr. K.S. Rao
10. Shri Vijay Inder Singla

Rajya Sabha

11. Shri V.P. Singh Badnore
12. Shri Shyamal Chakraborty
13. Shri Ram Chandra Khuntia
14. Shri Bhagat Singh Koshyari
15. Shri Jesudasu Seelam

16. Shri Mohammad Shafi

17. Shri Motilal Vora

18. Shri Veer Pal Singh Yadav

SECRETARIAT

1.	Shri Brahm Dutt	—	*Joint Secretary*
2.	Shri N.K. Pandey	—	*Additional Director*
3.	Shri Rajesh Ranjan Kumar	—	*Deputy Secretary*

LIST OF WITNESSES

The Ministry of New and Renewable Energy

1.	Shri Deepak Gupta	—	Secretary
2.	Shri R. Bhattacharya	—	Additional Secretary and FA
3.	Shri D. Majumdar	—	CMD, IREDA
4.	Dr. N.P. Singh	—	Scientist 'G'

2. At the outset, the Chairman welcomed the members of the Committee and the representatives of the Ministry of New and Renewable Energy to the sitting of the Committee and emphasized on exploiting the Renewable Energy sources in general and small hydro potential in particular to meet the ever growing energy demand of the country as the water resources in the country are available.

3. The Committee, thereafter, *inter-alia* discussed with the representatives of the Ministry of New and Renewable Energy the following important points:—

(i) Targets *vis-à-vis* achievement in the field of small and hydro power projects;

(ii) Targets for 12th and 13th Plans;

(iii) Need for better coordination with the State Governments for setting up Small and Mini Hydel Projects;

(iv) Reduction of the gestation period of Small and Mini Hydel Projects from 5-6 years to 2-3 years;

(v) Emphasizing the State Governments for introduction of Single Window clearance system for obtaining various clearances including environmental clearances; and

(vi) Reasons for large gap between loan sanctioned and loan disbursed by IREDA.

4. The Members sought clarifications on various issues relating to the subject and the representatives of the Ministry responded to the same. The Chairman directed the representatives of the Ministry to furnish written replies to the queries which could not be readily responded to by them.

The witnesses then withdrew.

The Committee then adjourned.

5. A verbatim record of the proceedings of the sitting of the Committee has been kept.

ANNEXURE II

MINUTES OF THE EIGHTH SITTING OF THE STANDING COMMITTEE ON ENERGY (2010-11) HELD ON 3RD MARCH, 2011 IN ROOM NO '134' PARLIAMENT HOUSE ANNEXE, NEW DELHI

The Committee sat from 1500 hrs. to 1600 hrs.

PRESENT

Shri Mulayam Singh Yadav — *Chairman*

Lok Sabha

2. Shri P.C. Chacko
3. Shri Paban Singh Ghatowar
4. Shri Syed Shahnawaz Hussain
5. Shri Sanjay Nirupam
6. Shri Jagdambika Pal
7. Shri Ravindra Kumar Pandey
8. Shri Radha Mohan Singh
9. Shri Vijay Inder Singla
10. Shri E.G. Sugavanam

Rajya Sabha

11. Shri Govindrao Adik
12. Shri V.P. Singh Badnore
13. Shri Ram Chandra Khuntia
14. Shri Jesudasu Seelam
15. Shri Mohammad Shafi

SECRETARIAT

1. Shri Brahm Dutt — *Joint Secretary*
2. Shri N.K. Pandey — *Additional Director*
3. Shri Rajesh Ranjan Kumar — *Deputy Secretary*

2. At the outset, the Chairman welcomed the members of the Committee and briefly apprised them of the Agenda for the sitting. The Committee then took up for consideration the draft Reports on:

(i) 'Transmission and Distribution Systems and Networks';

(ii) 'Funding of New and Renewable Energy Projects'; and

(iii) 'Small and Mini Hydel Projects'.

3. After discussing the contents of the Reports in detail, the Committee adopted the aforementioned draft Reports with minor modifications.

4. The Committee then authorized the Chairman to finalise the Reports taking into consideration the consequential changes arising out of factual verification, if any, by the concerned Ministries. The Committee also authorized the Chairman to present the Reports to both the House of Parliament.

5. *** *** *** *** ***

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The Committee then adjourned.