STANDING COMMITTEE ON ENERGY

(2004-05)

6

FOURTEENTH LOK SABHA

MINISTRY OF NON-CONVENTIONAL ENERGY SOURCES

DEMANDS FOR GRANTS
(2005-2006)

SIXTH REPORT

Presented to Lok Sabha on 21.4.2005

Laid in Rajya Sabha on 21.4.2005

LOK SABHA SECRETARIAT
NEW DELHI
April, 2005/ Chaitra, 1927 (Saka)

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3.	Shri P.K.Bhandari	- Director
4.	Shri Surender Singh	- Deputy Secretary
5.	Dr. Ram Raj Rai	- Under Secretary
6.	Shri N.K. Jha	- Committee Officer

INTRODUCTION

I, the Chairman, Standing Committee on Energy having been authorised by the Committee to present the Report on their behalf, present this Sixth Report (Fourteenth Lok Sabha) on Demands for Grants (2005-2006) relating to the Ministry of Non-Conventional Energy Sources.

2. The Committee took evidence of the representatives of the Ministry of Non-Conventional Energy Sources on 23rd March, 2005.

3. The Committee wish to thank the representatives of the Ministry of Non-Conventional Energy Sources who appeared before the Committee and placed their considered views. They also wish to thank the Ministry of Non-Conventional Energy for furnishing the replies on the points raised by the Committee.

4. The Report was considered and adopted by the Committee at their sitting held on 11th April, 2005.

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

NEW DELHI;
19 April, 2005
29 Chaitra, 1927 (Saka)

GURUDAS KAMAT,
Chairman,
Standing Committee on Energy.

REPORT

PART I

CHAPTER I

Introductory

Energy is a basic input for almost all the economic activities. In fact one of the indicators of economic growth has all along been the per capita consumption of energy. Therefore, energy security has come to be viewed as a factor of immense strategic importance in ensuring all-round economic development of a nation. Fossil fuels such as coal and petroleum, and biofuels like wood, have been the energy sources of the world for centuries. However, as the 20th century drew to a close, ushering in the third millenium, there has been a growing recognition, for more than one reasons, of the dangers inherent in continuing with the model of economic development based on excessive consumption of fossil fuels. Of late, world opinion has been growing in favour of looking for alternatives to fossil fuels that would ensure eco-friendly and sustainable development on the one hand and energy security on the other. There was a surge of interest, commitment and funding for developing and disseminating renewable energy technologies and strategies in the aftermath of the first oil crisis during the seventies. Subsequently, this interest declined due to the fall in oil prices during the nineties. However, local and regional environmental concerns such as air pollution, water pollution, land degradation, waste generation and global environmental concerns such as the growth in atmospheric concentration of the Green House Gases (GHGs) leading to climate change have again brought renewable energy to the centre stage. The broad goals of the Government of India under “Energy for All” concept assumes an increasing role for renewables, particularly for meeting the energy needs of rural areas and for environmental conservation. Under the influence of programmes of the UN Framework Convention on Climate Change(FCCC) and the Kyoto Protocol and the need for promoting sustainable development, renewable energy technology development and transfer and large scale funding are projected for the future.

1.2 India is a large country with a population of around one billion. Its population is expected to grow at a rate of about 1.6 per cent annually and GDP growth rate is estimated to grow at over 6 per cent, requiring an energy growth rate of 9 per cent. At present, there is estimated peaking shortage of 13% and energy shortage is about 7.8%. The electricity demand is growing @ 8% annually in the country. The shortage is much greater in rural areas. The present per capita electricity consumption in India is little over 400 kwh, which is already on a lower side and most of the consumption is in the urban areas. Consumption of coal and petroleum fuels is projected to nearly double by 2010. India is also projected to become an imported petroleum fuel dependent economy. Conditions

are thus compelling for India to attempt to meet its growing energy needs in a self-reliant manner, through renewable energy.

1.3 Recognising the relevance of renewable energy sources, the Government of India set up in 1981 a Commission for Additional Sources of Energy (CASE), on the lines of the Space Commission and the Atomic Energy Commission in the Department of Science and Technology. A year later, a separate Department of Non-Conventional Energy Sources was created in the Ministry of Energy. Ten years later, this was upgraded to the level of an independent Ministry. India has thus earned the distinction of possibly being the only country in the world to have an exclusive Ministry for Non-Conventional Energy Sources (MNES) which has been implementing one of the world's largest programmes on renewable energy, like biogas, small hydro projects, wind, geothermal energy, solar photovoltaics, etc. spanning the entire spectrum of technologies targeted towards all sections of the society. The two-fold objectives of the Ministry are (i) to increase the role of renewables in the energy sector and (ii) to reduce and mitigate the pollution caused by conventional fossil fuels. To subserve these objectives the Ministry functions as a catalyst, bringing into fruition the project proposals in the renewable energy sector through a range of policies and programmes.

1.4 Under the Allocation of Business Rules MNES has been assigned to carry out the following activities:-

- Research and development of biogas and programmes relating to biogas units;
- Commission for Additional Sources of Energy (CASE);
- Solar energy including Solar Photovoltaic (SPV) devices and their development, production and applications;
- All matters relating to small / mini / micro hydel projects of and below 25 MW capacity;
- Programme relating to improved chulhas and research and development thereof;
- Indian Renewable Energy Development Agency (IREDA) ;
- Research and development of other non-conventional / renewable sources of energy and programmes relating thereto;
- Tidal Energy;
- Integrated Rural Energy Programme (IREP);
- Geothermal Energy.

1.5 Since renewable energy can be produced in a decentralized manner, it can help to overcome the problems of distribution associated with conventional sources of energy, especially in remote rural areas. The significance of this is to be seen in the light of the fact that as many as 93,347 villages in the country are un-electrified and 25,000 of these villages are considered economically non-viable for grid connected power. Moreover, de-electrified villages which had lost their faith in conventional grid power could find a ray of hope through non-conventional grid quality power. It has been proposed to electrify all of these 25,000 remote villages and hamlets through locally available renewable energy options like solar photovoltatics (SPV), small hydro, biomass and hybrid systems within the next two Plan periods i.e. by the year 2012. During the 10th Plan period about 5000 unelectrified census villages are proposed to be electrified through the Non-Conventional Energy Sources.

1.6 The detailed Demands for Grants of the Ministry of Non-Conventional Energy Sources were laid on the Table of Lok Sabha on 18.03.2005. 'Demand No.65 of the Ministry under which provision has been made for Plan and Non-Plan expenditure, consists of two parts', viz. Revenue Section and Capital Section for the year 2005-2006. It contains the following figures: -

(Rs. in crore)

Plan		Non-Plan	Total
Revenue Section	529.70	5.63	535.33
Capital Section	70.05	-	70.05
Total	**599.75**	**5.63**	**605.38**

1.7 As a part of special initiative to develop the North-Eastern Region, the Ministry has earmarked 10% of its Domestic Budgetary Support for the North-Eastern States, including Sikkim, in its major programmes. Special emphasis has been made to take up the electrification of remote villages in this region.

1.8 A detailed statement showing the actual Revenue and Capital expenditure for the year 2002-2003, Budget Estimates, Revised Estimates for 2003-2004 and Budget Estimates for 2004-2005 are given at Appendix- I.

1.9 The details of financial outlay and physical targets & achievements of various programmes/schemes during the 10th Five year Plan and first three years of the Plan are given in Appendix-II.

1.10 The Committee have scrutinized the detailed Demands for Grants of the Ministry of Non-Conventional Energy Sources for the year 2005-2006 and approve the same, subject to their observations and recommendations which are contained in the succeeding Chapters.

CHAPTER II

A. ANALYSIS OF DEMANDS FOR GRANTS AND PLAN BUDGET OF THE MINISTRY OF NON-CONVENTIONAL ENERGY SORUCES

(i) Utilization of Plan outlay

The Ministry of Non-Conventional Energy Sources (MNES) is responsible for the promotion, development and utilization of various new and renewable sources of energy in the country. The MNES have presented the Demands for Grants to the tune of Rs. 605.38 crore (BE) for the year 2005-06. The following table shows the Budget Estimates (BE) and Actuals for the year 2003-04, Budget Estimates (BE) and Revised Estimates (RE) for the year 2004-05 and Budget Estimates (BE) for the year 2005-06 as under:

(Rs. in crore)

	2003-04		2004-05		2005-06
	BE	Actuals	BE	RE	BE
Plan	624.80	375.81	599.80	400.00	599.75
N-Plan	5.35	5.51	05.47	5.47	5.63
Total	630.15	381.32	605.27	405.47	605.38

2.2 The following table shows the Budget Proposals and Physical Target for 2005-06 in brief:-

Programme	BE (2005-06) (Rs. in crore)	Physical Target
Renewable Power	97	760 MW
Wind	5	450 MW
Biomass/Co-gen	16	160 MW
Gasifier	10 (+1NE)	10 MW
SHP	30(+20 NE)	130 MW
Waste to Energy	15	10 MW
Remote Village Electrification	155 (+30 NE)	1400 villages/400 hamlets
Biogas	15 (+1 NE)	35000 biogas plants
Solar Photovoltaic	25 (+2 NE)	1 lakh Solar Lantern
SPV Pumps	5.00	500 SPV Water Pumps
Solar Thermal	51(+2 NE)	3 lakh sq. m. collector areas
Renewable Energy/New Technology R&D	38.10	-
IREDA Equity	50.00	-
Others	99.90 (+4 NE)	-

2.3 When asked about the reasons for variations between BE and RE during the year 2004-05 and the schemes likely to be affected due to reduced budgetary allocation during the year, the Ministry in a written reply stated as follows:

> "The reason for the variation between BE and RE during the year 2004-05 is on account of the Gross Budgetary Support (GBS) being reduced by the Ministry of Finance at the RE stage. The delay in incurring expenditure was mainly due to the fact that the budget for 2004-05 was approved only during August, 2004 and pending budget approval as per vote on account no new projects could be approved. It may also be mentioned that on account of the directions received to align the schemes / programmes of this Ministry with the National Common Minimum Programme (NCMP), there was some unavoidable delay because the existing schemes / programmes required recasting and accordingly action could be commenced towards the close of the third quarter of the year. An actual expenditure during 2004-05 will be about Rs. 235 crore, which is the limit set by the Finance Ministry."

2.4 During the course of discussion, When the Committee wanted to know about the initiatives taken by the Ministry to persuade the Ministry of Finance not to slash the Budget at RE stage, Secretary, Ministry of Non-Conventional Energy Sources informed the Committee as under: -

> "…. I have made a request to the Secretary (Expenditure) and I expect that in the month of April, he will give me time. I will sit with him and tell him that if you are going to slash the amount in December, at least, ask so that we could tell that these are the sanctioned schemes which we may not be able to do. So, in the month of April, separate discussion will take place."

2.5 Elaborating further, one of the officials of the Ministry of Non-Conventional Energy Sources also informed during the discussion as under:-

> "…. So, unilaterally or otherwise, the Ministry of Finance, because of various constraints they also have cut down on the RE and then this year what they have done is apart from the RE cut they have said that not more than one-third of the RE will be spent in the last three months. If one has to look from a wider perspective, then I think, the more important thing is that we have to prepare our schemes on time. We have not been doing that."

2.6 When the Committee specifically enquired about the initiatives being taken by the Ministry to spend equal amounts of Budget in all quarters of the year and not to keep major portion of Budget for spending during the last three months of the year as per the instruction of Ministry of Finance, Secretary, Ministry of Non-Conventional Energy Sources replied during the discussion as under:-

> "…Sir, what we have done is that the entire items of expenditure have been listed. I am going to prepare a brief for the discussion with the Ministry of Finance on these lines saying that these are the schemes which are unavoidable and that one has to spend the money only in the last quarter. There are big schemes. But there are smaller ones where I personally find no reason as to why we should not take off right from the beginning. The list is being made. If you allow us time, I have a feeling that in the next financial year I would be in a position to clearly indicate to the Finance Ministry about the schemes which cannot be avoided and for the rest of the schemes I would say that I would try my best to see that it starts right from the beginning. This exercise is on….."

2.7 Explaining the rationale for allocating Rs. 605.38 crore (BE) during the year 2005-06 when the actual expenditure during the year 2003-04 was Rs. 381.32 crore only and RE for the year 2004-05 was brought down to Rs. 405.47 crore from Rs. 605.27 crore, the Ministry replied as under:

> "All renewable energy schemes / programmes have now been recast focusing on grid interactive and distributed renewable power systems; rural, urban, industrial and commercial applications; research, development, demonstration and commercialization with corresponding increase in the allocation for 2005-06."

2.8 Elaborating on the subject further, the Secretary, Ministry of Non-Conventional Energy Sources, stated:

> "…Had the Ministry of Finance not imposed a cut after the RE stage, we would have been able to clear another Rs. 150 crore to Rs. 160 crore of expenditure for which proposals are already in hand. As a result of these events, these proposals amount to Rs. 150 core to Rs. 160 crore would have to be met from the Budget for next financial year. They are all pending in hand."

2.9 The Committee note that as against the Budget estimates of Rs. 605.27 crore and Revised Estimates of Rs. 405.47 crore, the actual expenditure of the Ministry of Non-Conventional Energy Sources will be about Rs. 235 crore during the year 2004-05. The Committee are not convinced with the justification given by the Ministry that the reasons for variation between BE and RE is on account of Gross Budgetary Support being reduced by the Ministry of Finance at the RE stage and delay in Budget approval. The other reason that they had to recast the existing programmes and schemes as per the National Common Minimum programme of the new Government is also not convincing. The Committee understand that maximum Budget (2004-05) was allocated for on-going schemes and Vote on Account does not impose any restrictions on incurring expenditure on that. The Committee strongly feel that the Ministry of Non-Conventional Energy Sources are not utilising the funds equally in all the quarters due to which the Ministry of Finance reduced their allocation at RE stage from Rs. 605.27 crore to Rs. 405.47 crore and further reduced it to Rs. 235 crore since Ministry was not permitted to spend more than one third of RE during the last three months. The Committee, however, do not approve the approach of the Ministry of Finance also that they curtailed the allocation without consulting the Ministry of Non-Conventional Energy Sources. The Committee feel that instead of making a cut at RE stage based on the utilisation of funds during the first two quarters of the financial year it should be the actual utilisation during the last financial year. This would enable the Ministry of Finance to assess the real position and provide the required budget at RE Stage to the Ministries. The Committee approve the enhanced Budgetary allocation of Rs. 605.27 crore for the year 2005-06 and strongly recommend that Ministry should take initiatives to prepare and implement all their schemes and programmes in advance and prepare a uniform expenditure schedule spread over all quarters of the current financial year so that Ministry of Finance

may not get a chance to impose any restriction at RE Stage. The Committee also desire that the Ministry of Non-Conventional Energy Sources should convey the feelings of the Committee that Ministry of Finance must consider the views of Ministry of Non-Conventional Energy Sources before curtailing the Budget Estimates of the Ministry at R.E. stage so that implementation of important schemes do not suffer. The Committee also desire that the Ministry of Non-Conventional Energy Sources should also issue instructions to all concerned agencies responsible for implementation of schemes/programmes to prepare a time-bound programme for their implementation so that the expenditure may be uniform in all quarters. The Committee also note that the budget of the Ministry for the year 2005-06 has reduced as compared to BE in the year 2003-04. Considering the fact that the Ministry has been given the task of providing electricity to all the village households, which are not grid connected, by 2010, the allocations to the Ministry should have been suitable enhanced, where it has gone down. Otherwise also, if we consider the fact that the Ministry have outstanding liabilities to the tune of Rs. 150-160 crore, the left over budget with the Ministry may not be sufficient to achieve the set targets for the year 2005-06. The Committee, therefore strongly recommend that higher allocations be made at RE stage.

(ii) Potential and achievement of various renewable souces of energy

2.10 The estimated potential and the extent of exploitation for various renewable sources of energy are given as under:-

NRSE POTENTIAL & ACHIEVEMENT		
	Potential	Achievement as on 31.12.2004
Biogas Plants	120 lakh	37.10 lakh
Improved Chulhas	1,200 lakh	352 lakh
Wind	45,000 MW	2980 MW
Small Hydro	15,000 MW	1693.64 MW
Biomass Power / Co-generation	19,500 MW	727.53 MW
Biomass Gasifiers	-	62 MW
Waste-to-Energy	2700 MW	41.98 Mw
Solar Water Heating	1400 lakh sq. m. Collector Area	10 lakh sq. m. Collector Area
Solar PV	20 MW/sq. km	2.80 MWp *

*of this 75 MWp SPV products have been exported.

2.11 However, the Ministry have decided to discontinue some of the renewable energy programme whose BE/RE/Actuals for the years 2003-04, 2004-05 and 2005-06 are given as under: -

(Rs. in crore)

Programme	2003-04		2004-05		2005-06
	BE	Actuals	BE	RE	BE
IREP	4.11	12.12	8.99	12.50	1.00
SPV Irrigation Pump	28.00	24.03	12.00	11.50	5.00
Solar PV Power	6.00	1.10	2.00	5.00	0.00
Battery Operated Vehicles (Alternate Fuel for Surface Transport)	4.00	1.35	4.00	2.00	2.50

2.12 When asked about the reasons for overspending in the field of Integrated Rural Energy Programme during the year 2003-04, the Ministry in their written reply stated as under:

> " Integrated Rural Energy Programme is a Centrally Sponsored Scheme, which was significantly modified during the year 2003-04. Under the modified IREP scheme, the unit of planning changed from Development Blocks to the District. The modified scheme included preparation of district and state level rural energy plans, preparation and implementation

of model Integrated Rural Energy Projects in selected clusters of villages in the districts. The modified scheme further included enhanced support to regional IREP Training Centers and other technical backup units etc. The modified scheme provided for 50:50 costs sharing between Centre and the States as against the earlier share of 20:80. As a result of the enhanced Central share, the Central Financial Assistance(CFA) was increased as follows:

(Rs. in Lakh)

	CFA upto 2002-03	CFA since 2003-04
State Level IREP Cell	2.08	5.00
UT level IREP Cell	1.06	5.00
Block Level IREP Cell	1.23	10.00 (for Districts level IREP Cell in place of Block Level IREP Cell)
Regional IREP Training Centre	Funds provided on case to case basis	40.00 (Rs. 70.00 lakh for Shillong)

The BE provided for the IREP during 2003-04 was based on the provisions upto 2002-03, but with the modifications in the scheme, the requirement was enhanced and therefore expenditure was more. The expenditure made during 2003-04 was 50% of the sanctioned amount, and balance 50% is yet to be released"

2.13 Explaining the reasons for allocating the amount i.e. Rs. 1.00 crore only for IREP during the year 2005-06, while the actuals was Rs. 12.12 crore during the year 2003-04 and the budgetary allocation at RE stage fixed at Rs. 12.50 crore was increased from Rs. 8.99 crore at BE stage during the year 2004-05, the Ministry in their written reply stated as under:-

"The projection for BE in the Annual Plan 2005-06 was Rs.35.00 crore based on the progress made in implementation of modified IREP during 2003-04 and 2004-05. The Planning Commission without consulting the Ministry unilaterally decided to transfer this Centrally Sponsored Scheme to the States and informed this decision to the Ministry in the first week of February, 2005. Subsequently, as a result of the stand taken by the Ministry, the Planning Commission agreed to allocate Rs.1.00 crore for the same pending further review of the scheme by them. Since the decision of the Planning Commission was received late, it could not be incorporated in the Demands for Grants for 2005-06. Thus, there is no allocation made for IREP at BE stage for 2005-06 in the Demands for Grants. The committed liabilities under IREP are of the order of Rs. 28.00

crore as funds released to States during 2003-04 and 2004-05 were only 50% of the sanctioned CFA and balance is required to be released based on progress made and utilization of released CFA and the actual utilization of State share as the scheme is implemented on a 50:50 cost sharing basis between Centre and States. Meanwhile, the States have represented through letters sent by the Chief Ministers to the Deputy Chairman, Planning Commission and to the Hon'ble Minister for NES that the scheme should be continued in its present form as a Centrally sponsored scheme during 10th Plan period."

2.14 Specifying the reasons for non-allocation and reduced allocation of funds for Solar PV Power and SPV Irrigation Pump Programme respectively during the year 2005-06, the Ministry stated as under:-

"Grid interactive installed SPV power system costs are around Rs.25 crore / MW. Moreover, such plants are not capable of supplying electricity more than 1600 hrs. / annum at peak rate equivalent. Accordingly, the cost of power generated from such power plants are of the order of Rs. 12-15 per kWh, which is high compared to the conventional power. It has been decided to discontinue support for grid interactive SPV power plants for the aforesaid reasons. The spill over financial liabilities towards ongoing projects may have to be met from some other head of account of Photovoltaic Programme. Similarly, promotion of SPV Pumping Systems for individual users is being discontinued. It has been decided to deploy SPV Pumps for community applications only. Further, the subsidy on SPV Pumping Systems may also being reduced. With these change in the Programme, a reduced physical target of 500 SPV pumps has been proposed for 2005-06. Accordingly, lower budget estimates have been proposed."

2.15 It is mentioned in the Performance Budget (2005-06) that the Ministry now have decided to discontinue the support to Battery Operated Vehicles (BOVs) and will now support research, development and demonstration of hybrid electric vehicles during 2005-06. When asked about the reasons for discontinuation of and the cumulative amount spent on BOVs programme after continuing it for more than 10 years, the Ministry stated as under:-

"The Programme on Alternative Fuel for Surface Transportation which includes BOVs is being continued during 2005-06. The programme comprises research & development and demonstration of vehicles for surface transportation using alternate fuels. An expenditure of Rs.14.88

crore has so far been incurred since 1994-95 on R&D projects and deployment of 161 battery-operated vehicles (buses/mini buses, three-wheelers and passenger cars) in 15 States and three Union Territories."

2.16 During the course of evidence, the Committee made an observation that some renewable energy systems/devices are being installed by the independent private bodies. When the Committee enquired about the status of the private initiatives in the renewable energy sector, Secretary, Ministry of Non-Conventional Energy Sources informed the Committee as under:-

"….I pointed out to my colleagues that when they talk of achievement, they should not just talk about achievement because there is something happening outside. One can say that biomass, gassifiers can be used for thermal as well as electrical applications. I do not have the exact figures. I have reason to believe that 40 megawatt equivalent of thermal systems have been already installed in ceramic industry in Gujarat. What happens under the achievement column is an end estimate of what must be happening outside. I do not want to say very much more. One of ways to gauge success of our efforts is to see how much it gets down outside the Ministry's domain. The gasifier seems to be a very definite step into the future."

2.17 Elaborating further, the Secretary, Ministry of Non-Conventional Energy Sources stated:

" …I have told my officers in the States and nodal agencies not to shudder by this. You must also see what is happening outside. Now, there is a great deal of happening outside. In fact, if you look at it, we are not mentioning it. One another thing has taken place on its own. Similarly, biomass is likely to progress in that direction. I am only saying that there is a fair indication that we must now start looking at the activities outside our domain so that we get total picture."

2.18 The Committee find that the Ministry of Non-Conventional Energy Sources/ Planning Commission have decided to transfer IREP to State Governments and discontinue some of the other programmes like SPV pumping systems for individuals, SPV power plants and Battery Operated Vehicles (BOVs) due to various reasons. The Committee are surprised to note that Planning Commission has unilaterally decided to transfer IREP, a Centrally Sponsored Scheme to the States without consulting the Ministry of Non-Conventional Energy Sources. This has been done at the stage when the Centre's committed liabilities under IREP are of the order of Rs. 28 crore pertaining to years 2003-04 and 2004-05 and the Scheme had been recast recently raising Central assistance from 20% to 50%. The Committee feel that the Scheme should have been thoroughly examined at that point of time instead of taking piece-meal decisions. Now that the States have represented to the Planning Commission and the Ministry to continue this scheme in the same form, the Committee desire that the Scheme should be reviewed in its entirety to decide all the matters and to ensure that the Scheme shall achieve its desired goal.

2.19 The Committee further note that Ministry have also decided to discontinue SPV power plants, SPV irrigation pumps for individual and Battery Operated Vehicles during the year 2005-06 on account of relatively high capital costs when compared to conventional power systems. The Committee note that 2.80 MW capacity SPV Power Plants, 6452 Nos. of SPV Irrigation pumps for individuals and 161 BOVs have already been installed/deployed at present . The Committee are, therefore, concerned about the fate of operation, maintenance and upkeeping of these installed/deployed systems and also about fulfilling the financial liabilities towards the ongoing projects under these programmes. The Committee, therefore, recommend that the Ministry should make specific arrangements for the operation, management and upkeeping of the installed and deployed systems so that they complete their designed life and achieve the targets set for them and also recommend that the Ministry should meet the financial liabilities of on-going projects under the above-said programmes. The Committee feel that the performance of these schemes and programmes could not give desired results due to failure of the Ministry in reducing the cost of SPV module and their new experiment in the field of Battery Operated Vehicles. The Committee, therefore, recommend that R&D efforts of the Ministry should now be focused on the reduction of SPV module cost to at least one-half of current level. The Committee also desire that the Ministry should make intensive efforts to see to it that the equipment related to solar energy e.g. SPV system based on silicon etc. are manufactured indigenously. The Committee specifically desire that the Government should orient their R&D efforts towards development of non-silicon solar voltaic systems on the pattern of development of similar system in other parts of the world. At the same time, R&D efforts should also be reoriented towards hybrid vehicles in place of Battery Operated Vehicles.

2.20 The Committee note that India has been implementing one of the largest renewable energy programmes in the world. It has formulated and implemented a large diversity of renewable energy technologies such as wind, solar, biogas, biomass, small hydro and many new technologies such as hydrogen energy, chemical sources of energy including fuel cell energy, bio-fuels, etc. However, the penetration of renewables is far less as compared to the potential despite several innovative policies and measures used to promote them. The reason is not beyond the comprehension of the Committee. There are some renewable sources of energy like solar energy which is abundantly available but the technology has not yet achieved maturity. On the other hand, there are some renewable technologies like wind power, biomass gasifiers, small hydro power having high potentials of 45000 MW, 16000 MW and 15000 MW respectively and are matured and proven and have reached commercialisation stage. Yet these are unable to make any remarkable impact in the field of renewable energy sector. As by the end of the year 2004, it is possible to achieve only 2980 MW of wind energy, 62 MW of biomass gasifier and 1693.64 MW of small hydro power. The Committee feel that now it is the high time to analyse and understand the significance of renewables and the impact of policies and measures on their penetration and performance. It is the opinion of the Committee that technologies at different stages of development need different sets of policies and programmes. Research, development and demonstration are required for new emerging technologies which are in the demonstration phase like SPV, hydrogen energy, fuel cell energy, biofuels, etc. for cost reduction and high performance. On the other hand, commercialisation and private sector's involvement are required for technologically mature and proven sources which have reached the commercialisation phase like small hydro, wind power, solar water heating system, biomass gasifier, etc. The Committee, therefore, recommend that various renewable energy resources

pertaining to various programmes should be prioritised in the light of the technological advancement and their potentialities and allocate the higher budget for their advancement accordingly. Massive campaign are also required for these types of technologies to increase public awareness which alone would be helpful in increasing the demand for renewable energy systems and devices. The Committee also desire that Ministry of Non-Conventional Energy Sources should persuade all the State Governments to amend their building bye-laws and municipal laws to make it compulsory to install solar water heating system in all the high rise buildings as has been done in the States of Maharashtra and Karnataka.

2.21 The Committee note that in addition to efforts being made by the Government agencies, renewable energy systems/devices are also being installed and run through the private initiatives in different parts of the country. For example 40 MW equivalent of biomass power for thermal use has already been installed in ceramic industry in Gujarat without taking any assistance from the Government bodies. The Committee hope that similar other renewable systems have been established. The Committee are surprised to note that the Ministry of Non-Conventional Energy Sources have not tried to collect vital information about the contribution of such independent initiatives being made in various parts of the country in renewable energy sector. . It will be vital input for future planning. The Committee have a view that inclusion of energy produced out of such important initiatives may add significant quantity while compiling achievements in renewable energy sector. The Committee, therefore, desire that Ministry of Non-Conventional Energy Sources should take all initiatives to collect vital information relating to the production of power from new and renewable energy sources by independent agencies and also incorporate and consider this data in preparation of present and future planning relating to Non-Conventional Energy sector in the country. The Committee desire that for this purpose they must take the help of Non-Conventional Energy Sources officers in the States and nodal agencies concerned with this sector.

(iii) Training and Public Awareness

2.22 The Ministry of Non-Conventional Energy Sources are helping the promotion of renewable energy for wider acceptance and creation of awareness of the various Renewable Energy Programmes. This is being achieved by information dissemination and training of manpower and organisation of seminars/symposia, workshops, conferences and short-term training programmes. Ministry of Non-Conventional Energy Sources have been providing financial assistance to Government/Semi- Government/ financial and technical institutions/ Non- Governmental Organisations for organisation of national and international seminars/conferences, short duration awareness campaigns, etc. in order to facilitate interaction between all concerned and dissemination of knowledge for effective development and promotion of renewable energy programmes in the country. The Ministry have allocated Rs. 35.00 crore for Information and Publicity and Rs. 2.00 crore for training during the year 2005-06.

2.23 During the course of presentation before the Committee, the Ministry have informed that they had initiated the following steps for creating awareness.

- 20th August has been declared as "Rajiv Gandhi Akshya Urja Diwas" to create mass awareness
- Release of special postage stamp on renewable energy
- Three major conferences organised with states on power, rural and urban applications
- District Advisory Committees have been set up to oversee implementation of renewable energy programmes at district level
- Bi-monthly News Letter "Akshay Urja" has been released in Hindi & English for wider circulation
- Pamphlets have been published and booklets are being finalized to provide information on renewable energy technologies and applications.

- Renewable Energy Centres at state level for demonstration and training
- Mobile Exhibition Vans

District Advisory Committee for Renewable Energy

2.24 The Ministry of Non-Conventional Energy Sources are constituting "District Advisory Committees on Renewable Energy" in order to ensure the participation of various district level functionaries in popularising the use of renewable energy systems & devices among the common people.

2.25 The Committee will be headed by the District Collector/Deputy Commissioner while the Project Director of the District Rural Development Agency or Chief Executive Officer of Zila Parishad could be its Member Secretary. Its membership will comprise of district officers belonging to allied departments, such as Forests, Industries, Agriculture, Information Technology, Education, Health, etc., District Bar Council or Government Pleader, Lead Bank, selected Non-Governmental Organisations, Rotary Club, Lions Club, local industries associations, scientists, opinion makers and local leaders, etc. At least six members of the Committee will be women. The DAC will also include 4-6 members nominated by the Members of Parliament in respective districts. The Committee is expected to meet once in three months and will send reports to the Ministry through the State Nodal Departments/ State Nodal Agencies.

Objectives

2.26 The main objectives of the DAC would be to create awareness about various renewable energy devices and systems appropriate for a given district. The terms of references of the DAC will include (i) To support Ministry of Non-Conventional Energy Sources in planning and coordination of various renewable energy programmes and creation of mass awareness in the district on a continuing basis; (ii) To suggest

mechanism for formulation and implementation of village energy plans and programmes to cover remote and forest fringe villages for electrification through renewable energy systems; (iii) To coordinate and integrate implementation of various renewable energy programmes in the district and suggest measures for accelerated progress; (iv) To review achievements made under different programmes and suggest corrective measures; if any; and (v) To organise and monitor post-installation servicing of renewable energy devices/systems installed in the district and to safeguard interests of the public and consumer. The response from all the districts is very encouraging..

2.27 So far 400 MP's have nominated about 1200 members for these committees. Twenty Five States have issued notifications for setting up of DACs in each district and consequently 375 DACs have been setup in the country. The DACs in all districts are expected to be setup by end of March 2005.

2.28 During the course of evidence, when the Committee desired to know about the representation of the Zila Parishad in DACs, the Secretary, Ministry of Non-Conventional Energy Sources stated as under:

> "…It was suggested by our Minister that to start with, the Committee should start functioning under the Collector. Once it starts, people start getting used to it. We have to make improvement a little later."

2.29 On the issue of greater involvement of the staff working in DACs, and making the Committees more responsive, the Secretary, Ministry of Non-Conventional Energy Sources, assured the Committee during the course of discussion as under:-

> "… we would be sending a team of officers as soon as the Budget Session is over. Nowadays, the Parliament is in Session and it is very difficult for us to engage our officers in some other work. We will try to send our team in every State. We will discuss this matter with Energy Development Agency. One is our officers will sit there and try to sort out the procedural difficulties. There are States, which have already started functioning on this. Now, at this stage, I would assure this august Committee that this situation is likely to be improved in a couple of months."

2.30 When asked about the tie-ups with ITIs to impart requisite technical training to students to prepare a pool of trained personnel to provide technical assistance to the users of various renewable systems in the far flung areas, the Ministry replied as under:

> "The Ministry provides support to state nodal agencies for organizing technical training programmes by various institutions at the state and the regional levels including ITIs. From last year AMC coverage for SPV systems has been increased to 5-10 years so that the responsibility of maintenance is that of the manufacturers / suppliers. Further, in regard to biogas plants, users training courses and free maintenance warranty for three years are being provided."

2.31 The Committee note that the country is implementing diverse renewable energy technologies like wind, solar and biomass energy. However, there is a lack of awareness amongst the public at large about the utility of these sources and hence their proper utilisation. The Ministry have informed that they have been providing financial assistance to a number of Governmental and Non-Governmental Organisations to disseminate knowledge for effective development and promotion of renewable energy programmes. The Ministry further informed the Committee that they are also constituting District Advisory Committees to ensure the participation of district level functionaries in the popularisation and use of renewables. A number of functions have been assigned to DACs for the purpose. The Committee feel that apart from the various steps taken by the Ministry for popularisation of the renewals, there is a need to bring awareness amongst students also by introducing the subject in their curriculum. The Committee feel that apart from providing awareness amongst the students it can also provide technical manpower to install, operate and maintain the various systems of renewable energy. The Committee therefore recommend that the Ministry should take up the matter with AITEC and various Education Boards to do the needful.

2.32 The Committee welcome the recently taken initiative by the Government to form "District Advisory Committees (DACs) on Renewable Energy" for the popularisation of renewable systems/devices amongst the rural masses. The Committee, however, note that DACs have been established in 400 districts of the country but actually only 315 are functioning. The Committee desire DACs should also be established in all the remaining districts of the country during the shortest possible time. The Committee desire that the Government should take the help of Public representatives, if necessary, for timely formation of these committees in the districts where they have not been formed. The Committee also recommend that the Central Government should issue broad guidelines for these committees and provide each State an adequately trained staff for periodic updating of the data and continuous review of performance of various renewable energy programmes at district levels. The Committee specifically desire that the Government should develop a better mechanism for closer coordination with States and district level agencies for implementation of schemes relating to development of Non-Conventional Energy Sources.

(iv) Small Hydro Power

2.33 This Ministry is also responsible for the exploitation of small hydro power since the year 1989. The country has a small hydro power (projects of upto 25 MW capacity) potential of about 15000 MW. So far, 514 projects with an aggregate capacity of 1693.94 MW have been installed. Besides, 159 projects with a capacity of 488 MW are under implementation. The database of SHP projects created by Ministry of Non-Conventional Energy Sources now includes 4,233 potential sites with an aggregate capacity of 10,324 MW. An average capacity addition of about 100 MW per year from small hydro projects is being achieved. The Ministry made a resolve to add 2000 MW which is 2% of the total addition of 10,000 MW by 2012 A.D. which is likely to be overachieved. During the first three years i.e. 2002-05 of the Tenth Five Year Plan, the Ministry have performed well in this sector. Rs. 69.53 crore have already been spent out of the Revised Estimates of Rs. 69.73 crore and they have achieved 254 MW out of the total Tenth Plan target of 600 MW.

2.34 As regards the physical achievements in the small hydro sector, the representatives of the Ministry elaborated during the course of evidence as under:

> "… it is like this. We have a target of 100 MW per year and we have achieved 102 MW. We have cumulatively achieved 224 MW, as has been mentioned here. This figure pertain to 30.12.2004. As on date the achievement is 266 MW. We hope that by 31 March, it will be 270 MW. For the coming year, i.e., 2005-06, our target is 130 MW. So, that makes it 400 MW. For the final year, the target is 200 MW. I do not think, it would be achieved. It would only be 150 MW or so. So, what we would achieve is 550 MW. However, with your permission, I would like to add that our target of 600 MW emanated from the fact that we propose to add two per cent to the additional capacity in the Tenth Plan. That two percentage figure is being maintained and would be crossed, if we achieve 550 MW."

2.35 The Committee find that the energy from Small Hydro Power is the most reliable of all renewable energy sources which can provide electricity for the rural, remote areas and hilly terrain in our country in a cost effective and environmentally benign manner. Small Hydro upto 3 MW was transferred to the Ministry of Non-Conventional Energy Sources during 1989. Ten years later, with effect from 29th November, 1999, the small hydro power between 3-25 MW were also brought under the purview of this Ministry. Within this short span of time, the Ministry have been able to achieve 1693.94 MW out of the total hydropower potential of 15000 MW in our country. Now, the Ministry have set a target of 600 MW to be achieved by the end of the Tenth Five Year Plan i.e. by the year 2007 A.D. and 2000 MW by the year 2012 A.D. During the first three years of the Tenth Five Year Plan, the Ministry could achieve 254 MW with an expenditure of Rs. 69.53 crore, achieving cent-per-cent utilisation. This shows that the Ministry of Non-Conventional Energy Sources have now got the requisite skill, strength and capabilities to install, operate and maintain even the Mega Hydro Projects. Considering the fact that hydro power in itself is the most important renewable source of energy, the Committee strongly recommend that all the projects, including mega hydro power projects, should be brought under the control of the Ministry of Non-Conventional Energy Sources. The Committee desire that this matter should be taken up at the highest level in consultation with the Ministry of Power and the outcome of the discussions should be conveyed to the Committee within three months of the presentation of the Report.

CHAPTER III

Various Programmes Under Renewable Energy Sector

(i) Village Energy Security Programme (VESP)

At present, 80% of the total rural energy consumption comes from non-conventional energy in the form of traditional biomass such as fuelwood, animal dung and agro wastes used for cooking and heating at very low efficiencies. Technologies have now been developed and tried out which can convert biomass into different forms of energy in an efficient and cost effective manner. It is, therefore, thought that it should now be possible to think in terms of a programme for providing people in the villages the opportunity to progressively become free from energy insecurity. Such a programme will extend beyond the concepts of oil security or rural electrification *per se* as generally understood.

Aims & Objectives

3.2 The objective of the village energy security programme is to go beyond mere electrification through meeting the entire energy needs of a village of cooking, lighting and motive power, with full participation of the local community, including women. The projects would generate local employment, thus improving the quality of life by raising economic standards of the village community.

Scope

3.3 Test projects on village energy security are being taken up to demonstrate the techno-economic parameters, provide operational experience, mobilize local communities and firm up the institutional arrangements. The test projects would be undertaken in remote villages and hamlets, where grid extension is either not cost-effective or feasible, with an emphasis on forest fringe and tribal villages.

Activities

3.4 The activities envisaged under these projects are:

(i) Identification of village/ hamlet; (ii) Preparation of a Village Energy Plan, including assessment of resources, energy services required and configuration of energy production systems; (iii) Formation of a Village Energy Committee; (iv) Creation of a Village Energy Fund; (v) Plantations and installation of energy production systems; (vi) Operation & maintenance; (vii) Capacity building including training. The energy production systems would comprise biogas plants based on dung or leafy biomass, biomass gasifiers coupled to 100% producer gas engines and biofuel run pumpsets.

Implementation / Monitoring Strategy:

3.5 The test projects would be undertaken by a Village Energy Committee duly constituted by the Panchayat, and facilitated by implementing agencies such as District Rural Development Agencies (DRDAs), forestry departments and NGOs, with overall coordination and monitoring by the State Nodal Agencies.

Funding/ Financing:

3.6 90% of the capital cost of the test projects would be met through a Central grant, subject to a benchmark of Rs.20,000/- per beneficiary household for meeting the total domestic and community energy requirements. The balance 10% towards the capital cost would be mobilized by the community / implementing agency / State Nodal Agency. The village energy security projects would evolve village-level planning and implementation in order to meet the total energy requirements of the village mainly through local renewable resources. The energy services are to be owned and maintained by the village community. The projects involve active community participation and have considerable potential for local employment generation. The Ministry has so far received

237 preliminary proposals from 14 States. Of these, 95 proposals have been short-listed for preparation of detailed proposals for the test projects, including 41 proposals from forest departments, 41 from NGOs, 10 from DRDAs and 3 from tribal development agency. 36 detailed proposals have so far been forwarded to the Ministry. A total 200 projects are proposed to be taken up initially in the test phase. A number of these are likely to be completed during 2005-06. An amount of Rs.20 crore has been proposed for the village energy security test projects under the budget provision for the RVE programme.

3.7 When asked about the different sources of financing the scheme, the Ministry replied :-

> "It has been estimated that a village energy security test project for a typical village of 100 households would require a capital investment of about Rs. 20 lakhs. In addition, a sum of Rs. 8 lakhs per village is required for meeting the implementation, coordination and monitoring costs. 90% of the capital cost of the test project, subject to a benchmark of Rs.20,000/- per household would be met through a Central grant, and the balance 10% would be mobilized by the community / implementing agency / State Nodal Agency (SNA) or through MPLAD / MLALAD funds."

3.8 As regards the details of operation, maintenance and sustainability mechanism of the projects installed under the VESP, the Ministry replied as under:-

> "The village energy security test projects would be set up by the village community, which will also be responsible for their operation/management. The implementing agencies (DRDA / Forest Department / NGO) would help them in setting up the projects and their maintenance for a certain period after commissioning through suitably trained local youth. The responsibility for operation / management would subsequently be undertaken by the Village Energy Committee. These services could also be leased out to an entrepreneur. The Village Energy Committee will determine and collect the user charges for the energy services, which will be used towards operation, maintenance and management costs of the projects. Availability and sustainability of the biomass resources would be ensured through plantations of fast growing tree species and oil-bearing plants raised by the local community. "

3.9 Informing about the different mode of renewable energy systems/technologies applied to provide energy security under VESP, the Ministry replied as under:-

> "The configuration of energy systems in a village energy security test project would depend on availability of local resources and the energy requirements of the community. An appropriate technology mix will be selected from available biomass conversion technologies such as: -
>
> - Improved cookstoves
> - Biogas plants using cattle dung, tree based organic substrates, vegetable wastes, kitchen wastes, etc.
> - Biomass Gasifiers coupled with 100% gas engines or dual fuel engines run on bio-fuels in lieu of diesel.
> - Stationary diesel engines run on straight vegetable oils or bio-diesel."

3.10 The Committee are happy to note that Village Energy Security Programme is being launched by the Ministry of Non-Conventional Energy Sources to meet the total energy requirements of all the villages, including cooking, lighting and motive power with full participation of the local communities including women. The Government have decided to set up 200 projects in the test phase. This programme is mainly based on the use of biomass. The test projects would be undertaken mainly through the biomass which is abundantly available even in remote villages and hamlets, where grid connection is either impossible or not cost-effective, with an emphasis on forest fringe and tribal villages on 90:10 cost sharing basis between Centre and Community/implementing agencies/State Nodal Agencies. During the year 2005-06, it is proposed to allocate an amount of Rs. 20 crore under the budget provision for Remote Village Electricity Programme. The Committee feel that to make this programme a success, it is necessary to assess all the needs of the villages selected and resources available and then develop a suitable technology package to meet the total energy needs in a sustainable and financially viable way. There is a need to evolve strategy for village level planning and implementation also. The Committee, therefore, desire that simultaneous initiatives be taken in these directions. Another point which needs to be considered is that feedstock needs to be grown to ensure sustainable supply. There are land tenural problems also which should be taken on priority basis. Tribal and the residents of forest fringe areas are difficult to reach and converse because of difficult topography and also languages. They are also averse to outsiders and also to new technologies. The Ministry, therefore, should take cautious steps while approaching them. Absence of community institutions will be a major problems for this programme because this programme depends heavily on Village Energy Committee for their operations and management. The village energy committee may also be the victims of

groupism and internal bickering. The Committee desire that the Ministry should also take this very important point into account before entrusting accountability on any committees or organisations. The Committee hope and trust that the Ministry will be able to overcome all the problems associated with the scheme through their Research and Development (R&D), field demonstration and capacity building programme.

(ii) Urban & Industrial Waste Programme

3.11 It is estimated that about 30 million tonnes of solid waste and about 4400 million cubic meters of liquid waste are generated in India every year. This estimate is based on the database prepared for 299 Class-I cities and 36 Class-II cities. Most of these wastes find their way into land and water bodies without proper treatment, leading to problems of environmental pollution with adverse effect on public health. A potential for generating about 1700 MW of power from urban/ municipal wastes [1450 MW from Municipal Solid Wastes (MSW) and 250 MW from Municipal Liquid Wastes (Sewage)] and about 1000 MW from various industrial wastes (both solids and liquids) has been estimated for the country. Waste-to-Energy projects, especially those for MSW, are a relatively new concept in India and state-of-the-art technologies in general are not indigenously available. The technologies of biomethanation of sewage and industrial wastes are well established, but those for municipal solid wastes are still under demonstration phase.

3.12 Indicative costs of projects based on different technologies are given below:

Technology	Cost/MW (Rs./ crore)
• Combustion/ Incineration	6-7
• Gasification/ Pyrolysis	8-10
• Biomethanation	
➢ Industrial waste	4-6
➢ Urban waste	10-12

3.13 Projects based on industrial wastes are generally commercially viable because of the lower installation costs, captive use of the generated biogas/ power and negligible cost of raw material. The viability of projects based on MSW, on the other hand, is critically dependent on the price realized for generated energy/ other bye-products, cost of disposal of the rejects/ residual waste, etc.

3.14 The Ministry has been implementing two programmes for recovery of energy from Urban and Industrial wastes. National Programme on Energy Recovery from Urban and Industrial wastes and UNDP/GEF assisted Project on 'Development of High Rate Biomethanation Processes as means of Reducing Green House Gases Emission'.

3.15 The National Programme on energy Recovery from Urban & Industrial wastes, launched during the year 1995-96, has the following objectives.

- To promote setting up of projects for recovery of energy from wastes of renewable nature from Urban and Industrial sectors; and
- To created conducive conditions and environment, with fiscal and financial regime, to develop demonstrate and disseminate utilisation of wastes for recovery of energy.
- To develop and demonstrate new technologies on waste-to-energy through R&D projects and pilot plants.

3.16 The scheme is applicable to private and public sector entrepreneurs and organisations as well as Non-Governmental Organisations (NGOS) for setting up of waste-to-energy projects on the basis of Build, Own & Operate (BOO), Build, Own, Operate and Transfer (BOOT), Build, Operate & Transfer (BOT) and Build Operate Lease & Transfer (BOLT). It is being implemented through State Nodal Agencies, who forward the Detailed Project Reports, received from the promoters, to Ministry of Non-Conventional Energy Sources along with their recommendations in respect of financial,

managerial and technical capabilities of the promoters and on assured availability of waste materials on a long term basis (over 10 years) for operating the project smoothly.

3.17 The BE, RE and actual expenditure since the year 2000 under the Programme on Energy Recovery from Urban and Industrial Wastes are as follows:

(Rs .in lakhs)

Year	BE	RE	Actual Expenditure
2000-01	2000	800	800
2001-02	1500	1500	1435
2002-03	2000	1100	1100
2003-04	1400	704	434.69
2004-05	1500	1000	442*

* up to March 15, 2005

3.18 When asked about the reasons for variations between BE/RE and actual, the Ministry replied as under:

> "Variations in BE/RE and actual expenditure have mainly been on account of the following factors. Under this Programme considerable time is required for project development, financial closure and implementation. Sustained efforts have to be made for creating awareness among the municipalities and in industry; motivating entrepreneurs; and, convincing financial institutions, in view of perceived risks. Even after the sanction of the projects, funds cannot be released on account of delay in signing of various agreements for supply of waste, land lease, power purchase and obtaining necessary statutory clearances, etc. "

3.19 Physical targets and achievements since the year, 2000 are as follows:

Year/ Plan	Physical, Mega Watts	
	Target	Achievement
2000-01	10.00	1.00
2001-02	10.00	5.55
2002-03	10.00	3.75
2003-04	10.00	15.50
2004-05	10.00	4.00*

* up to March 15, 2005

3.20 As regards the variations in physical targets and achievements, the Ministry replied as under:-

> "The variation between targets and achievements is mainly on account of delays in project development, financial closure and statutory clearances and implementation. Also in view of long gestation, completion of projects has not been possible in the year of the sanction. The physical and financial targets for the 10th Plan period are 80 MW and Rs. 125.00 crore respectively. An achievement of 23.25 MW has been made with an expenditure of Rs. 19.67 crore against RE of Rs. 28.04 crore during the first three years of the 10th Plan period. The Ministry is in the process of providing renewed thrust for acceleration of this programme. However, the targets fixed for the 10th Plan period are not likely to be achieved."

3.21 As regards the motivational/promotional steps taken by the Ministry to enthuse Urban Local Bodies (ULBs) and industries including PSUs and corporate bodies to opt for such schemes, the Ministry stated as under:-

> "Ministry has been providing financial support and incentives for setting up of waste to energy projects, demonstration as well as commercial projects, to promoters, State Nodal Agencies, Urban Local Bodies and Financial Institutions. These include funds for awareness creation, training, preparation of project reports, workshops/seminars, etc. Two National conferences – (a) Workshop on National Master Plan on Waste to Energy in April, 2004 and (b) Conference on Renewable Energy for Urban Areas in September, 2004 were organised to motivate stakeholders for promotion of energy recovery from wastes."

3.22 When asked about the details of the thrust areas identified by the Ministry in this sector and the various steps undertaken by the Ministry, the Ministry replied as under: -

> "Ministry is giving thrust for promotion of projects for recovery of energy from urban wastes in all the cities and wastes from industries which have a large potential for recovery of energy such as distilleries, food and fruit processing industries, pulp & paper and sugar industries, poultry, slaughterhouse, and tannery wastes, etc. A National Master Plan has been prepared and is under finalisation for the overall development of this sector, with a perspective upto 2017."

3.23 Details of the three completed projects on MSW are given as under:

5 MW municipal solid waste (MSW) based project at Lucknow: The project based on biomethanation technology has been executed by M/s Asia Bioenergy Pvt. Ltd (ABIL), Chennai on Build, Own, Operate and Maintenance basis in association with Lucknow Nagar Nigam (LNN) who are responsible for supply of required quality and quantity of MSW at the plant site.

6 MW MSW based power plant at Vijaywada: The project based on combustion technology has been executed by M/s Sriram Energy Systems (P) Ltd., Hyderabad by availing a soft loan from Technology Development Board (Department of Science and Technology) and Indian Renewable Energy Development Agency (IREDA). Total MSW treated was around 50,000 Metric tonnes.

6 MW Municipal Solid waste project at Hyderabad: It was commissioned in November 2003 by M/s SELCO International and is running successfully. This project has generated 28 million units of electricity till December 2004 by treating around 1 million metric tonnes of MSW since inception.

3.24 A visit to 6 MW capacity MSW based power plant and RDF preparation plant based on MSW installed by M/s SELCO International at Hyderabad was made by the members of the Parliamentary Committee on Energy during 17-18th October, 2004. Officials of Ministry of Non-Conventional Energy Sources and State Government accompanied the Parliamentary Committee. The Committee appreciated the initiative taken by M/s SELCO International in treating the MSW of Hyderabad City by way of installation of these plants.

3.25 The Committee have noted that the quantity of garbage generated in the city of Mumbai is about 8000 metric tonnes per day and the same is collected and transported every day to the dumping grounds. The Municipal Corporation of Mumbai

had finalised and awarded three waste to energy projects in the year 1999. But this could not start due to delay in clearance from Maharashtra Electricity Regulatory Commission. These projects are still under review. They have started work on appointment of Consultant for the study of waste composition as well as to give advise in selecting the most techno economically suitable processing technologies for disposal of waste as well as long term scientific management of the dumping ground/land fill sites.

3.26 The Committee note that as against the projected target of 80 MW under the Urban and Industrial Waste Programme during the Tenth Five Year Plan, the Ministry has been able to achieve 23.25 MW during the first three years of the Plan period with an expenditure of Rs. 19.67 crore. After analysing the utilisation of funds under this programme, the Committee find that there are major slippages during 2003-04 and 2004-05. During 2003-04 they could spent only Rs. 4.34 crore against R.E. of Rs. 7.04 crore and during 2004-05 they have spent Rs. 4.42 crore only upto 15.3.3005 against the R.E. of Rs. 10 crore. The Committee are not satisfied with the justification given by the Ministry about the poor utilisation of fund allocated for this project. The Committee find that the factors mentioned by the Ministry like delay in signing various agreements for supply of wastes, land lease, power purchase, obtaining statutory clearances and delay in project development etc. for delay in implementing of programme simply show the lack of proper efforts on the part of the Ministry. With this type of casual approach, it does not seem possible to achieve the targets set for the Tenth Five Year Plan. The Committee, therefore recommend that the Ministry should adopt a multiprong approach to achieve the financial and physical targets of Tenth Plan. The Committee desire that single window clearance system should be developed to obtain clearances in a time-bound manner. The Committee specifically desire that the Ministry should finalise the National Master Plan for development of waste to energy. They also desire that R&D efforts should be expedited for reduction in cost of power production from Municipal waste. The Committee would also like time-bound initiatives to modify financial support scheme which is under review to give a major fillip to this programme. The Committee may be apprised of the efforts undertaken by the Ministry and outcome thereof.

3.27 The Committee note that as per database prepared for 299 Class -I cities and 36 Class-II cities, it is estimated that more than 30 million tonnes of solid waste and

4400 million cubic meters of liquid waste are generated every year in the urban areas of the country. There is a potential for generating about 1700 MW of power from urban/Municipal wastes. The Ministry of Non-Conventional Energy Sources had launched the National Programme on Energy Recovery from Urban and Industrial waste during the year 1995-96. But the Committee are sorry to note that no significant progress has been made so far particularly in the field of energy from Municipal Solid Wastes. Only three projects have been commissioned in the field of power production from Municipal Solid Waste. These projects are situated at Lucknow (5MW), Vijaywada (6MW) and Hyderabad (6MW). The Committee had an opportunity to visit one of such projects situated at Hyderabad. The Committee are impressed and appreciate the initiative taken by M/s SELCO International in treating the Municipal Solid Waste of Hyderabad City by installation of 6MW capacity MSW based power plant and RDF preparation plant based on MSW. The Committee also have an information that in the metro cities of Delhi and Mumbai and some other cities like Vijaywada, Municipal bodies are willing to establish similar Waste-to-Energy projects/plants. As an initial step, segregation of wastes has already started. The Committee desire that Ministry of Non-Conventional Energy Sources should prepare similar promising projects for all the major cities where huge quantity of solid waste is generated. For this purpose, they should provide the required technologies and expertise to all the interested promoters in consultation with State Government authorities and experts. The Committee strongly recommend that the Government should give all possible subsidies/incentives to the promoters interested in such projects. The Committee also note that the state-of-art technologies for energy projects for Municipal waste in general are not available in the country. The Committee, therefore, strongly recommend that the Government should

take all the initiatives to make the state-of-art technologies for such projects indigenously available.

(iii) Hydrogen Energy and Chemical Sources of Energy Programme

3.28 In recent years Hydrogen has been receiving worldwide attention as a clean and efficient energy carrier with a potential to replace liquid fossil fuels. Significant progress has been reported by several countries including India in the development of hydrogen energy as an energy carrier and an alternative to fossil fuels.

3.29 Hydrogen is colourless, odourless, tasteless and flammable gaseous substance having highest energy content to the order of 120.7 Kilo Joules/gram. Hydrogen can be used for a wide range of applications including power generation and vehicular transport. Hydrogen can be used either directly in IC engines or through fuel cells for production of motive power and electricity. A fuel cell is an electrochemical devise that converts energy into electricity and heat without combustion. Fuel cell systems generally operate on pure hydrogen and air to produce electricity with water and heat as the only by-products. Fuel cells are modular in construction and their efficieny is independent of size. Fuel cells are emerging as a clean and fuel-efficient technology for stationary and portable applications. Fuel cells can be potentially used in domestic, industrial, transport and agricultural sectors and also in remote areas for reliable power supply. A budgetary provision of Rs. 7.00 crore has been made for the Hydrogen Energy during 2005-06 while only Rs. 0.70 crore could be spent during the year 2003-04 and Rs. 2.00 crore was allocated at BE/RE stage during the year 2004-05. Similarly Rs. 8.00 crore has been made for the Chemical Sources of Energy programme during the year 2005-06 while only Rs. 0.37 crore could be utilised during 2003-04 and Rs. 2.00/3.00 crore were allocated at B.E./R.E. stage during the year 2004-05.

3.30 When asked about the reasons for enhanced allocation of budget of Rs. 7.00 crore for Hydrogen Energy during the year 2005-06 while Rs. 0.70 crore only could be utilised during the year 2003-04, the Ministry in their reply stated:-

"Hydrogen energy programme is in the initial stages of development. This being a new area of technology it takes considerable time to develop technically viable proposals; therefore, the expenditure on hydrogen energy was low in 2003-04. During 2004-05 the expenditure so far is Rs. 1.30 crores. With a view to accelerate progress in developing hydrogen energy as a fuel, Ministry has set up National Hydrogen Energy Board consisting of high level representation from Government, industry, academic and research institutions and other experts. The Board has had two meetings and has set up a Steering Committee under Shri Ratan Tata to prepare a National Hydrogen Energy Road Map. Based on the deliberations of the Board so far it is proposed to significantly expand the activities of the hydrogen energy and fuel cell programme for which initially a provision of Rs.7.0 crore has been made for hydrogen R&D and demonstration activities. Some of the major activities proposed during 2005-06 include (i) R&D on hydrogen production from renewable methods, development of different types of solid state storage methods and improvements in IC engine vehicles and generators involving industry etc., (ii) Development and demonstration of hydrogen powered IC engine vehicles – Buses and three wheelers etc. and (iii) Setting up of a Hydrogen demonstration facility at Solar Energy Centre of the Ministry."

3.31 Similarly, extending the reasons for enhanced allocation of budget of Rs. 8.00 crore during 2005-06 for Chemical Sources of Energy while Rs. 0.37 crore could be utilised during the year 2003-04, the Ministry stated :-

"The programme on Chemical Sources of Energy, which deals with development of fuel cell technology, is in the initial stages of development. Being a new technology area, it takes considerable time to develop technically feasible proposals and therefore the expenditure on Chemical Sources of Energy was low during 2003-04. During 2004-05 the expenditure upto 15.03.2005 is Rs. 1.096 crores. The fuel cell allocation has been enhanced on account of the formation of National Hydrogen Energy Board and their allied activities as mentioned in the preceeding para. During 2005-06 a budgetary provision of Rs. 8.00 crore has been made for R&D and demonstration activities. Some of the major activities proposed during 2005-06 include (i) R&D on various aspects of fuel cells including development of materials, components, sub-systems, reformers, fuel cell stacks and fuel cell systems for both power generation and transport applications, (ii) Improvements in fuel cell vehicles and power packs involving industry etc., (iii) Setting up of a Nodal Centre for the development of Fuel Cell Technologies. and (iv) Setting up of a Fuel Cell Demonstration Facility at the Solar Energy Centre of the Ministry."

3.32 As regards the thrust areas identified by the Government for R&D on hydrogen and chemical sources of energy, the Ministry replied as under:

"The thrust areas identified for the programmes on Hydrogen Energy include R&D on various aspects of hydrogen energy including its production, mainly through non-hydrocarbon methods, storage of hydrogen in solid state materials and development of applications of hydrogen through combustion route including use in vehicles. Ministry is holding consultations with various research groups and industry to develop proposals on different aspects of R&D and demonstration in hydrogen energy. The thrust areas identified for the programmes under Chemical Sources of Energy include R& D on various aspects of fuel cells, including development of materials, components, subsystems, reformers, fuel cell stacks and fuel cell systems. It has been decided to set up a National Hydrogen Energy Board for both the programmes. The Board has constituted a Steering Committee to prepare National Hydrogen Energy Road Map, which will identify specific thrust areas, technology gaps and set up targets to be achieved and programmes to be developed to achieve these goals. It is expected that the implementation of the Road Map would result in the accelerated development of hydrogen energy technologies suitable for the country."

3.33 Elaborating the merits and demerits of the hydrogen energy over the other New Technologies being pursued by the Government, the Ministry informed as under:-

"Under the New Technology programme development is being supported in (i) hydrogen energy, (ii) chemical sources of energy – mainly fuel cells, (iii) electric vehicles and (iv) bio-fuels. Fuel cells require hydrogen as a fuel. Therefore, among these options (i) hydrogen and fuel cells and (ii) bio-fuels can be considered for both decentralized power generation as well as in transport applications. Hydrogen is available in abundance. It is found in water, biomass and hydrocarbons. However, it is not found as an independent gas in the atmosphere. At present, hydrogen is being produced as a part of the process in fertilizer and petroleum refining industries. Hydrogen is produced as a by-product in chlor-alkali industry. At present, it is considered necessary to support development of all new technology options and take up demonstration in vehicles and power generation. Since the programmes on hydrogen energy and chemical sources of energy are still in the development stages, it would be desirable to pursue all the options which are suitable for the country."

3.34 The Committee observe that Hydrogen is one of the most important environmentally benign renewable sources of energy having the higher energy content

and is abundantly available. It is also observed that the Ministry of Non-Conventional Energy Sources have been supporting a broad based programme on Research and Development (R&D) and demonstration for over a decade on various aspects of hydrogen energy which includes, *inter-alia*, its production mainly through non-hydrocarbon methods, storage in solid state materials and its utilisation as fuel. Institutions like IITs, CSIR laboratories and industrial and governmental organisations are actively involved in the promotion, development and utilisation of hydro-energy through these programmes with much enthusiasm. Furthermore, the Ministry have set-up a National Hydrogen Energy Board (NHEB) to prepare Energy Road Map to integrate and co-ordinate the national efforts on different aspects of hydrogen and fuel cell technologies. The Committee note that during the last three financial years, the budget had not been utilised. However, considering the fact that this is a new and emerging technology, the Committee feel that there is a need to show progress in R&D sector. In view of the above mentioned efforts, the Committee hope and support the enhanced budgetary allocation of Rs. 7.00 crore and Rs. 8.00 crore during the year 2005-06 for the hydrogen and chemical sources of energy respectively. The Committee, however, feel that this budget should be used for further research to develop clean and low cost hydrogen generation techniques from renewable sources, to make storage methods, especially solid-state methods more efficient, compact and its safe transport and delivery at different places keeping in view of the different need and requirement and difficult terrain of the country. Research should also incorporate the development of standards, codes and regulations to address our concerns about safety and security. To achieve all these objectives expeditiously in a time-bound manner, the Committee recommend that National Hydrogen Energy Board should expedite the process of preparation of National Hydrogen Energy Road Map by identifying thrust areas, strengthening the various

national level Research and Development efforts and by defining the goals and preparing the action plans accordingly. The Committee also desire that the Government should make sincere efforts for international tie-ups in the field of Hydrogen energy to take advantage of R&D work being undertaken in other parts of the world in this field.

3.35 The Committee observe that the Programme on Alternate Fuel for Surface Transportation which includes research and development and demonstration of Battery Operated Vehicles (BOVs) using alternate fuels was launched during 1994-95. Till now, the Ministry have been successful in deployment of 161 BOVs (buses/mini-buses, three-wheelers and passenger-cars) in 15 states and three Union Territories at the cumulative expenditure of Rs. 14.88 crore. Now, during the year 2005-06, it has been decided by the Ministry to replace this programme by hybrid electric vehicle programme. Rs. 2.50 crore has been allocated for this programme during the year 2005-06. The Committee welcome this step of improvement. However, they are of the view that one of the major limitations of the existing vehicles using lead-acid batteries is the limited driving range of the vehicle per charge of the battery. The Committee, therefore, recommend that the Government should make all efforts to develop and deploy newer types of rechargeable batteries having higher capacity at lower costs through focussed R& D efforts.

(iv) Biomass Gasifier Programme

3.36 Biomass can be converted into gaseous form through the gasification route. Biomass gasifiers convert solid biomass materials such as wood, agricultural and agro-industrial waste etc. into producer gas through thermo-chemical gasification process. A physical target of 10 MW equivalent biomass gasifier systems has been fixed and Rs. 10.00 crore (BE) has been allocated for the same during the year 2005-06. During 2003-04, Rs. 2.69 crore only out of the budgetary allocation of Rs. 4.00 crore could be utilised and during the year 2004-05, Rs. 11.00 crore was allocated at the BE stage which was further reduced to Rs. 5.00 crore at the RE stage.

3.37 The activities under the Biomass Gasifier Programme are :

- Supporting / facilitating development, demonstration and commercialization of technologies in biomass gasification for various end-uses.
- Supporting / facilitating R&D on gasification, producer gas engines, and related activities.
- Support to demonstration projects for 100% indigenously developed and manufactured producer gas engines coupled with gasifiers for power generation.
- Support to and enlargement of these activities, through awareness creation, publicity measures, seminars/ workshops / business meets/training programmes etc.

3.38 The details of physical and financial achievements for the last 3 years and present financial year are given below: -

A. PHYSICAL (in MW)

2001-02		2002-03		2003-04		2004-05 (upto Feb.05)	
Target	Achiev.	Target	Achiev.	Target	Achiev.	Target	Achiev.
7	11.12	10	2.07	5	4.8	10	8.33

B. FINANCIAL (in Crores of Rupees)

2001-02		2002-03		2003-04		2004-05 (upto Feb.05)	
BE/RE	Actual	BE/RE	Actual	BE/RE	Actual	BE/RE	Actual
6.0/6.70	6.95	5/3.25	3.69	4/2.20	2.69	11/5.0	3.48

3.39 The Committee noted that only an amount of Rs. 2.69 crore was used during 2003-04. Similarly, as against the BE of Rs. 11 crore and RE was kept as Rs. 5 corre during 2004-05. When the Committee wanted to know about the justification for allocating Rs. 10 crore during 2005-06, the Ministry replied as under:-

> "During 2003-04, the financial achievement in biomass gasifier programme was affected due to delay in completion of village electrification projects in the North-Eastern States, whose component in the target was around 50%. The biomass gasifier projects in North-Eastern States were delayed due to difficult site conditions. The difference in BE/RE and actual expenditure during 2002-03 was because of a mandatory cut imposed by Ministry of Finance. During 2004-05, the difference between BE and RE was primarily on account of the fact that a number of planned initiatives such as a scheme for installation of biomass gasification systems in engineering colleges as an educational tool, setting up of 4 regional biomass gasification testing centers, etc. could not be taken up for a variety of reasons The allocation at RE stage has been further reduced due to restrictions imposed by Ministry of Finance."

3.40 The Committee note that during the last several years, the Ministry has not been able to utilize the amount allocated for the Biomass gasifier programme. This shows the lack of proper attention by the Government on such an important programme. The Committee are of the view that the Ministry of Non-Conventional Energy Sources should be more specific in identifying the reasons for under achievements in the physical and financial field and then pursue their case on sound footing with the Ministry of Finance so that they may not be able to impose financial cut on the Biomass Gasifier Programme during the current financial year. The Committee, however, find that the target fixed for the programme is quite low particularly when the biomass generation potential is of the order of 19,500 MW and the technology to harness them is quite mature. The Committee, therefore, recommend that the Ministry should fix higher targets and allocate more budget for the Biomass gasifier programme from the next financial year so that the abundantly available biomass resources may be harnessed expeditiously in a time bound manner. To get better results, the Committee desire that the Governments should provide more incentives to Village Panchayats interested in Biomass Gasifiers Programme.

(v) Biomass Power/ Co-generation Programme and National Biogas Programme

3.41 Biomass Energy and Co-generation Programmes is being implemented with the main objective of promoting technologies for optimum use of country's biomass power generation potential estimated at 19,500 MW, including 3,500 MW of exportable surplus power from bagasse based co-generation in sugar mills. During 2003-04, the actual utilisation was Rs. 11.95 crore against the BE of Rs. 17.65 crore. The BE/RE for the year is Rs. 14.54 crore /Rs. 2.54 crore. Now, a budgetary provision of Rs. 16.00 crore for the year 2005-06 has been kept for the programme.

3.42 The major activities under the Biomass Power/Co-generation Programme are given below:

i) Promotion of technologies of co-generation, specifically including bagasse based cogeneration in sugar mills, and direct biomass utilization for megawatt scale electricity production.
ii) Development of a Biomass Resource Atlas based on biomass resource assessment studies in different regions of the country.
iii) Support to R&D for the development of technologies such as Advanced Biomass Gasification and applications research for enhancement of potential in identified areas of thrust.
iv) Support to promotional activities such as awareness creation, publicity measures, seminars/workshops/business meets etc.

3.43 The details of physical and financial achievements for the last 3 years and present financial year are given below:-

A. PHYSICAL (in MW)

2001-02		2002-03		2003-04		2004-05 (upto Feb.05)	
Target	Achiev.	Target	Achiev.	Target	Achiev.	Target	Achiev.
80	89	100	102.63	125	129.50	125	126.1

B. FINANCIAL (in Crore of Rupees)

2001-02		2002-03		2003-04		2004-05 (upto Feb.05)	
BE/RE	Actual	BE/RE	Actual	BE/RE	Actual	BE/RE	Actual
15.00/21.75	21.75	19.28/16.78	16.78	18.00/16.50	11.95	14.54/12.54	5.78

3.44 When asked about the justifications for allocating Rs. 16.00 crore during the year 2005-06, when the actuals during the year 2003-04 was Rs. 11.95 crore only and the BE of Rs. 14.54 crore which is reduced to Rs. 12.54 crore at RE stage during the year 2004-05, the Ministry stated as under:-

> "The difference in actual expenditure and the RE figures during 2003-04 was primarily on account of withholding release of financial assistance to many mature biomass power/cogeneration projects at the end of the financial year in Karnataka due to cancellation of signed PPAs by the State Government. Similarly during 2004-05, the actual expenditure is less than the BE and RE as this issue could not be resolved and also on account of the unforeseen cut/restriction imposed by the Ministry of Finance."

3.45 As regards the hindrances faced by the developers to exploit the targeted potential, the Ministry replied as under:

> "The main constraints faced by the developers in exploitation of the targeted potential of biomass power /cogeneration are:- (i) Difficulties in obtaining loans for cogeneration projects on account of poor creditworthiness of most sugar mills, especially cooperative. Since the cooperative sugar mills form a significant component of the sugar sector in the country, their inability to install cogeneration facilities results in a significantly lower exploitation of potential. (ii) Near obsolescence of a large number of sugar mills in the country. Many old sugar mills have small capacities which are lower than even the minimum economic capacity specified by the Government. These mills neither have the financial resources nor sufficiently long crushing periods which would make their optimum cogeneration projects viable. (iii) Availability of adequate quantity of biomass. Adequate availability of biomass for grid interactive power generation has been a problem in some areas. (iv) Non-fixation of attractive preferential tariff, wheeling and banking rates and third-party sale rates in some potential states has led to under exploitation of the potential. There are a few reports that project promoters are not being paid in time for the electricity supplied by them in some states. "

National Biogas Programme

3.46 The Ministry of Non-Conventional Energy Sources has been promoting family type biogas plants since 1981-82 with objectives:

(i) to provide clean and affordable source of biogas energy,
(ii) to produce and use enriched organic manure,

(iii) to develop management systems for using digested slurry for value added products,
(iv) to improve sanitation and hygiene by attaching toilets with biogas plants,
(v) to mitigate drudgery of women and girl children; and
(vi) to generate employment in rural areas

A cumulative total of 36.70 lakh plants have been set up in the country, against an estimated potential of about 120 lakh plants. The reported achievement during the financial year 2004-05 till December 2004 is around 43,593 against the annual target of 1 lakh plants.

The Programme is being implemented through State nodal departments and agencies and Khadi and Village Industry Commission besides a few Non-Governmental Organisations one of the main components of the programme is to create awareness and impart training for construction and maintenance of various models of biogas plants. In many States Village Panchayats and Local Bodies such as Mahila Mandals and Yuvak Kendras are actively associated for such activities.

3.47 The Committee observe that the Ministry of Non-Conventional Energy Sources was able to utilise Rs. 11.95 crore only out of the Budget Estimates of Rs. 18 crore and Revised Estimates of Rs. 16.50 crore the Biomass Power/Co-generation programme during the year 2003-04. Similarly, during the year 2004-05 only, Rs. 5.78 crore could be utilised (upto February 2005) out of Rs. 14.54 crore of B.E. and Rs. 12.54 crore. One of the reasons as extended by the Ministry, for the difference in actual expenditure and Revised Estimates during the year 2003-04, was that the financial assistance was withheld at the end of the financial year due to cancellation of the signed Power Purchase Agreements by the State Government of Karnataka. Unfortunately, the issue was not resolved immediately and the actual utilisation during the year 2004-05 also got affected. As a result of which, the difference between RE and actuals increased from Rs. 4.55 crore during the year 2003-04 to Rs. 6.76 crore during the year 2004-05. The Committee, therefore, recommend that the Government should go into the details of the reasons for the cancellation of PPAs signed by the State Government of Karnataka and settle the problem once for all. The Committee also desire that preventive measures should be taken to stop such cancellations in future so that the actual utilisation of the allocated fund is not affected.

3.48 The Committee have noted that the Biomass power/Co-generation programme are being implemented by the Ministry of Non-Conventional Energy Sources to exploit the estimated potential of 19,500 MW including 3,500 MW of exportable surplus power from bagasse-based Co-generation in sugar mills. As on 31.12.2004, 727.53 MW which includes 437.03 MW from bagasse Co-generation and 290.50 MW from biomass combustion projects have been set up in the country. This accounts for only 3.7 per cent of the total assessed potential of 19,500 MW. The Committee feel that the Ministry are not making much headway in harnessing the huge potential of biomass. Analysing the various problems associated with the programme, the Committee further noted that Co-generation projects are unable to obtain loans from the various financial institutions on account of poor financial position of most sugar mills especially Co-operative. Inadequate availability of biomass for the power projects are the other major problems. Sometimes, the project promoters are not paid in time for the electricity supplied by them in some States. The Committee, therefore, recommend that the Government should make all out efforts to rectify all these problems by convincing the various financial institutions to provide loans on softer terms to sugar mills, especially the Co-operatives; promoting energy plantation having fast growing and high energy density biomass, giving directions to all potential states to issue attractive preferential tariff, wheeling and banking rates and third party sales and to pay in for their outstanding dues for the electricity supplied by them. The Government should consider a Single Window Clearance System for sugar factories intending to start co-generation projects. The Committee may be apprised of the various efforts made and resultant outcome thereof.

3.49 The Committee observe that as against the estimated potential of 120 lakh Biogas plants only 36.70 lakh plants have been set up in the country. The Ministry has not been able to achieve the targets set during the year 2003-04 and 2004-05. The Committee note that in some States Village Panchayats and Local Bodies are being associated with such activities. The Committee desire that Government should ensure more and more participation of these bodies in setting up of biogas plants to spread public awareness in the region. The Committee also desire that suitable tie-ups should be done with Dairy Organisations to harness the full potential.

GURUDAS KAMAT
Chairman, Standing Committee on Energy

NEW DELHI
19 April, 2005
29 Chaitra, 1927 (Saka)

STATEMENT OF CONCLUSIONS/RECOMMENDATIONS
OF THE STANDING COMMITTEE ON ENERGY
CONTAINED IN THE REPORT

Sl. No.	Reference Para No. of the Report	Conclusions/Recommendations
1.	2.	3.
1.	2.9	The Committee note that as against the Budget estimates of Rs. 605.27 crore and Revised Estimates of Rs. 405.47 crore, the actual expenditure of the Ministry of Non-Conventional Energy Sources will be about Rs. 235 crore during the year 2004-05. The Committee are not convinced with the justification given by the Ministry that the reasons for variation between BE and RE is on account of Gross Budgetary Support being reduced by the Ministry of Finance at the RE stage and delay in Budget approval. The other reason that they had to recast the existing programmes and schemes as per the National Common Minimum programme of the new Government is also not convincing. The Committee understand that maximum Budget (2004-05) was allocated for on-going schemes and Vote on Account does not impose any restrictions on incurring expenditure on that. The Committee strongly feel that the Ministry of Non-Conventional Energy Sources are not utilising the funds equally in all the quarters due to which the Ministry of Finance reduced their allocation at RE stage from Rs. 605.27 crore to Rs. 405.47 crore and further reduced it to Rs. 235 crore since Ministry was not permitted to spend more than one third of RE during the last three months. The Committee, however, do not approve the approach of the Ministry of Finance also that they curtailed the allocation without consulting the Ministry of Non-Conventional Energy Sources. The Committee feel that instead of making a cut at RE stage based on the utilisation of funds during the first two quarters of the financial year it should be the actual utilisation during the last financial year. This would enable the Ministry of Finance to assess the real position and provide the required budget at RE Stage to the Ministries. The Committee approve the enhanced Budgetary allocation of Rs. 605.27 crore for the year 2005-06 and strongly recommend that Ministry should take initiatives to prepare and implement all their schemes and programmes in advance and prepare a uniform expenditure schedule spread over all quarters of the current financial year so that Ministry of Finance may not get a chance to impose any restriction at RE Stage. The Committee also desire that the Ministry of Non-Conventional Energy Sources should convey the feelings of the Committee that Ministry of Finance must consider the views of Ministry of Non-Conventional Energy Sources before curtailing the Budget Estimates of the Ministry at R.E. stage so that

implementation of important schemes do not suffer. The Committee also desire that the Ministry of Non-Conventional Energy Sources should also issue instructions to all concerned agencies responsible for implementation of schemes/programmes to prepare a time-bound programme for their implementation so that the expenditure may be uniform in all quarters. The Committee also note that the budget of the Ministry for the year 2005-06 has reduced as compared to BE in the year 2003-04. Considering the fact that the Ministry has been given the task of providing electricity to all the village households, which are not grid connected, by 2010, the allocations to the Ministry should have been suitable enhanced, where it has gone down. Otherwise also, if we consider the fact that the Ministry have outstanding liabilities to the tune of Rs. 150-160 crore, the left over budget with the Ministry may not be sufficient to achieve the set targets for the year 2005-06. The Committee, therefore strongly recommend that higher allocations be made at RE stage.

2. 2.18 The Committee find that the Ministry of Non-Conventional Energy Sources/ Planning Commission have decided to transfer IREP to State Governments and discontinue some of the other programmes like SPV pumping systems for individuals, SPV power plants and Battery Operated Vehicles (BOVs) due to various reasons. The Committee are surprised to note that Planning Commission has unilaterally decided to transfer IREP, a Centrally Sponsored Scheme to the States without consulting the Ministry of Non-Conventional Energy Sources. This has been done at the stage when the Centre's committed liabilities under IREP are of the order of Rs. 28 crore pertaining to years 2003-04 and 2004-05 and the Scheme had been recast recently raising Central assistance from 20% to 50%. The Committee feel that the Scheme should have been thoroughly examined at that point of time instead of taking piece-meal decisions. Now that the States have represented to the Planning Commission and the Ministry to continue this scheme in the same form, the Committee desire that the Scheme should be reviewed in its entirety to decide all the matters and to ensure that the Scheme shall achieve its desired goal.

3. 2.19 The Committee further note that Ministry have also decided to discontinue SPV power plants, SPV irrigation pumps for individual and Battery Operated Vehicles during the year 2005-06 on account of relatively high capital costs when compared to conventional power systems. The Committee note that 2.80 MW capacity SPV Power Plants, 6452 Nos. of SPV Irrigation pumps for individuals and 161 BOVs have already been installed/deployed at present . The Committee are, therefore, concerned about the fate of operation, maintenance and upkeeping of these installed/deployed systems and also about fulfilling the financial liabilities towards the ongoing projects under these programmes. The Committee, therefore, recommend that the Ministry should make specific

arrangements for the operation, management and upkeeping of the installed and deployed systems so that they complete their designed life and achieve the targets set for them and also recommend that the Ministry should meet the financial liabilities of on-going projects under the above-said programmes. The Committee feel that the performance of these schemes and programmes could not give desired results due to failure of the Ministry in reducing the cost of SPV module and their new experiment in the field of Battery Operated Vehicles. The Committee, therefore, recommend that R&D efforts of the Ministry should now be focused on the reduction of SPV module cost to at least one-half of current level. The Committee also desire that the Ministry should make intensive efforts to see to it that the equipment related to solar energy e.g. SPV system based on silicon etc. are manufactured indigenously. The Committee specifically desire that the Government should orient their R&D efforts towards development of non-silicon solar voltaic systems on the pattern of development of similar system in other parts of the world. At the same time, R&D efforts should also be reoriented towards hybrid vehicles in place of Battery Operated Vehicles.

4. 2.20 The Committee note that India has been implementing one of the largest renewable energy programmes in the world. It has formulated and implemented a large diversity of renewable energy technologies such as wind, solar, biogas, biomass, small hydro and many new technologies such as hydrogen energy, chemical sources of energy including fuel cell energy, bio-fuels, etc. However, the penetration of renewables is far less as compared to the potential despite several innovative policies and measures used to promote them. The reason is not beyond the comprehension of the Committee. There are some renewable sources of energy like solar energy which is abundantly available but the technology has not yet achieved maturity. On the other hand, there are some renewable technologies like wind power, biomass gasifiers, small hydro power having high potentials of 45000 MW, 16000 MW and 15000 MW respectively and are matured and proven and have reached commercialisation stage. Yet these are unable to make any remarkable impact in the field of renewable energy sector. As by the end of the year 2004, it is possible to achieve only 2980 MW of wind energy, 62 MW of biomass gasifier and 1693.64 MW of small hydro power. The Committee feel that now it is the high time to analyse and understand the significance of renewables and the impact of policies and measures on their penetration and performance. It is the opinion of the Committee that technologies at different stages of development need different sets of policies and programmes. Research, development and demonstration are required for new emerging technologies which are in the demonstration phase like SPV, hydrogen energy, fuel cell energy,

biofuels, etc. for cost reduction and high performance. On the other hand, commercialisation and private sector's involvement are required for technologically mature and proven sources which have reached the commercialisation phase like small hydro, wind power, solar water heating system, biomass gasifier, etc. The Committee, therefore, recommend that various renewable energy resources pertaining to various programmes should be prioritised in the light of the technological advancement and their potentialities and allocate the higher budget for their advancement accordingly. Massive campaign are also required for these types of technologies to increase public awareness which alone would be helpful in increasing the demand for renewable energy systems and devices. The Committee also desire that Ministry of Non-Conventional Energy Sources should persuade all the State Governments to amend their building bye-laws and municipal laws to make it compulsory to install solar water heating system in all the high rise buildings as has been done in the States of Maharashtra and Karnataka.

5. 2.21 The Committee note that in addition to efforts being made by the Government agencies, renewable energy systems/devices are also being installed and run through the private initiatives in different parts of the country. For example 40 MW equivalent of biomass power for thermal use has already been installed in ceramic industry in Gujarat without taking any assistance from the Government bodies. The Committee hope that similar other renewable systems have been established. The Committee are surprised to note that the Ministry of Non-Conventional Energy Sources have not tried to collect vital information about the contribution of such independent initiatives being made in various parts of the country in renewable energy sector. . It will be vital input for future planning. The Committee have a view that inclusion of energy produced out of such important initiatives may add significant quantity while compiling achievements in renewable energy sector. The Committee, therefore, desire that Ministry of Non-Conventional Energy Sources should take all initiatives to collect vital information relating to the production of power from new and renewable energy sources by independent agencies and also incorporate and consider this data in preparation of present and future planning relating to Non-Conventional Energy sector in the country. The Committee desire that for this purpose they must take the help of Non-Conventional Energy Sources officers in the States and nodal agencies concerned with this sector.

6 2.31 The Committee note that the country is implementing diverse renewable energy technologies like wind, solar and biomass energy. However, there is a lack of awareness amongst the public at large about the utility of these sources and hence their proper utilisation. The Ministry have informed that they have been

providing financial assistance to a number of Governmental and Non-Governmental Organisations to disseminate knowledge for effective development and promotion of renewable energy programmes. The Ministry further informed the Committee that they are also constituting District Advisory Committees to ensure the participation of district level functionaries in the popularisation and use of renewables. A number of functions have been assigned to DACs for the purpose. The Committee feel that apart from the various steps taken by the Ministry for popularisation of the renewals, there is a need to bring awareness amongst students also by introducing the subject in their curriculum. The Committee feel that apart from providing awareness amongst the students it can also provide technical manpower to install, operate and maintain the various systems of renewable energy. The Committee therefore recommend that the Ministry should take up the matter with AITEC and various Education Boards to do the needful.

7 2.32 The Committee welcome the recently taken initiative by the Government to form "District Advisory Committees (DACs) on Renewable Energy" for the popularisation of renewable systems/devices amongst the rural masses. The Committee, however, note that DACs have been established in 400 districts of the country but actually only 315 are functioning. The Committee desire DACs should also be established in all the remaining districts of the country during the shortest possible time. The Committee desire that the Government should take the help of Public representatives, if necessary, for timely formation of these committees in the districts where they have not been formed. The Committee also recommend that the Central Government should issue broad guidelines for these committees and provide each State an adequately trained staff for periodic updating of the data and continuous review of performance of various renewable energy programmes at district levels. The Committee specifically desire that the Government should develop a better mechanism for closer coordination with States and district level agencies for implementation of schemes relating to development of Non-Conventional Energy Sources.

8. 2.35 The Committee find that the energy from Small Hydro Power is the most reliable of all renewable energy sources which can provide electricity for the rural, remote areas and hilly terrain in our country in a cost effective and environmentally benign manner. Small Hydro upto 3 MW was transferred to the Ministry of Non-Conventional Energy Sources during 1989. Ten years later, with effect from 29th November, 1999, the small hydro power between 3-25 MW were also brought under the purview of this Ministry. Within this short span of time, the Ministry have been able to achieve 1693.94 MW out of the total hydropower potential of 15000 MW in our country. Now, the Ministry have set a target of 600 MW to be achieved by the end of the Tenth Five Year Plan i.e. by the year 2007 A.D. and 2000 MW by the year 2012 A.D. During the first three years of the Tenth Five Year Plan, the Ministry could achieve 254 MW with an expenditure of Rs. 69.53 crore, achieving cent-per-cent utilisation. This shows that the Ministry of Non-Conventional Energy Sources have now got the requisite skill, strength and capabilities to install, operate and maintain even the Mega Hydro Projects. Considering the fact that hydro power in itself is the most important renewable source of energy, the Committee strongly recommend that all the projects, including mega hydro power projects, should be brought under the control of the Ministry of Non-Conventional Energy Sources. The Committee desire that this matter should be taken up at the highest level in consultation with the Ministry of Power and the outcome of the discussions should be conveyed to the Committee within three months of the presentation of the Report.

9. 3.10 The Committee are happy to note that Village Energy Security Programme is being launched by the Ministry of Non-Conventional Energy Sources to meet the total energy requirements of all the villages, including cooking, lighting and motive power with full participation of the local communities including women. The Government have decided to set up 200 projects in the test phase. This programme is mainly based on the use of biomass. The test projects would be undertaken mainly through the biomass which is abundantly available even in remote villages and hamlets, where grid connection is either impossible or not cost-effective, with an emphasis on forest fringe and tribal villages on 90:10 cost sharing basis between Centre and Community/implementing agencies/State Nodal Agencies. During the year 2005-06, it is proposed to allocate an amount of Rs. 20 crore under the budget provision for Remote Village Electricity Programme. The Committee feel that to make this programme a success, it is necessary to assess all the needs of the villages selected and resources available and then develop a suitable technology package to meet the total energy needs in a sustainable and financially viable way. There is a need to evolve strategy for village level planning and implementation also. The

Committee, therefore, desire that simultaneous initiatives be taken in these directions. Another point which needs to be considered is that feedstock needs to be grown to ensure sustainable supply. There are land tenural problems also which should be taken on priority basis. Tribal and the residents of forest fringe areas are difficult to reach and converse because of difficult topography and also languages. They are also averse to outsiders and also to new technologies. The Ministry, therefore, should take cautious steps while approaching them. Absence of community institutions will be a major problems for this programme because this programme depends heavily on Village Energy Committee for their operations and management. The village energy committee may also be the victims of groupism and internal bickering. The Committee desire that the Ministry should also take this very important point into account before entrusting accountability on any committees or organisations. The Committee hope and trust that the Ministry will be able to overcome all the problems associated with the scheme through their Research and Development (R&D), field demonstration and capacity building programme.

10. 3.26 The Committee note that as against the projected target of 80 MW under the Urban and Industrial Waste Programme during the Tenth Five Year Plan, the Ministry has been able to achieve 23.25 MW during the first three years of the Plan period with an expenditure of Rs. 19.67 crore. After analysing the utilisation of funds under this programme, the Committee find that there are major slippages during 2003-04 and 2004-05. During 2003-04 they could spent only Rs. 4.34 crore against R.E. of Rs. 7.04 crore and during 2004-05 they have spent Rs. 4.42 crore only upto 15.3.3005 against the R.E. of Rs. 10 crore. The Committee are not satisfied with the justification given by the Ministry about the poor utilisation of fund allocated for this project. The Committee find that the factors mentioned by the Ministry like delay in signing various agreements for supply of wastes, land lease, power purchase, obtaining statutory clearances and delay in project development etc. for delay in implementing of programme simply show the lack of proper efforts on the part of the Ministry. With this type of casual approach, it does not seem possible to achieve the targets set for the Tenth Five Year Plan. The Committee, therefore recommend that the Ministry should adopt a multiprong approach to achieve the financial and physical targets of Tenth Plan. The Committee desire that single window clearance system should be developed to obtain clearances in a time-bound manner. The Committee specifically desire that the Ministry should finalise the National Master Plan for development of waste to energy. They also desire that R&D efforts should be expedited for reduction in cost of power production from Municipal waste. The Committee would also like time-bound initiatives to modify financial support scheme which is under review to give a major fillip to this programme. The Committee may be apprised of the efforts undertaken by the Ministry and outcome thereof.

11 3.27 The Committee note that as per database prepared for 299 Class -I cities and 36 Class-II cities, it is estimated that more than 30 million tonnes of solid waste and 4400 million cubic meters of liquid waste are generated

every year in the urban areas of the country. There is a potential for generating about 1700 MW of power from urban/Municipal wastes. The Ministry of Non-Conventional Energy Sources had launched the National Programme on Energy Recovery from Urban and Industrial waste during the year 1995-96. But the Committee are sorry to note that no significant progress has been made so far particularly in the field of energy from Municipal Solid Wastes. Only three projects have been commissioned in the field of power production from Municipal Solid Waste. These projects are situated at Lucknow (5MW), Vijaywada (6MW) and Hyderabad (6MW). The Committee had an opportunity to visit one of such projects situated at Hyderabad. The Committee are impressed and appreciate the initiative taken by M/s SELCO International in treating the Municipal Solid Waste of Hyderabad City by installation of 6MW capacity MSW based power plant and RDF preparation plant based on MSW. The Committee also have an information that in the metro cities of Delhi and Mumbai and some other cities like Vijaywada, Municipal bodies are willing to establish similar Waste-to-Energy projects/plants. As an initial step, segregation of wastes has already started. The Committee desire that Ministry of Non-Conventional Energy Sources should prepare similar promising projects for all the major cities where huge quantity of solid waste is generated. For this purpose, they should provide the required technologies and expertise to all the interested promoters in consultation with State Government authorities and experts. The Committee strongly recommend that the Government should give all possible subsidies/incentives to the promoters interested in such projects. The Committee also note that the state-of-art technologies for energy projects for Municipal waste in general are not available in the country. The Committee, therefore, strongly recommend that the Government should take all the initiatives to make the state-of-art technologies for such projects indigenously available.

12 3.34 The Committee observe that Hydrogen is one of the most important environmentally benign renewable sources of energy having the higher energy content and is abundantly available. It is also observed that the Ministry of Non-Conventional Energy Sources have been supporting a broad based programme on Research and Development (R&D) and demonstration for over a decade on various aspects of hydrogen energy which includes, *inter-alia*, its production mainly through non-hydrocarbon methods, storage in solid state materials and its utilisation as fuel. Institutions like IITs, CSIR laboratories and industrial and governmental organisations are actively involved in the promotion, development and utilisation of hydro-energy through these programmes with much enthusiasm. Furthermore, the Ministry have set-up a National Hydrogen Energy Board (NHEB) to prepare Energy Road Map to integrate and co-ordinate the national efforts on different aspects of hydrogen and fuel cell technologies. The Committee note that during the last three financial years, the budget had not been utilised. However, considering the fact that this is a new and emerging technology, the Committee feel that there is a need to show progress in R&D sector. In view of the above mentioned efforts, the Committee hope and support the enhanced budgetary allocation of Rs. 7.00 crore and Rs. 8.00 crore during the year 2005-06 for the hydrogen and chemical sources of energy respectively. The Committee, however, feel that this budget should be used for further research to develop clean and low cost hydrogen generation techniques

from renewable sources, to make storage methods, especially solid-state methods more efficient, compact and its safe transport and delivery at different places keeping in view of the different need and requirement and difficult terrain of the country. Research should also incorporate the development of standards, codes and regulations to address our concerns about safety and security. To achieve all these objectives expeditiously in a time-bound manner, the Committee recommend that National Hydrogen Energy Board should expedite the process of preparation of National Hydrogen Energy Road Map by identifying thrust areas, strengthening the various national level Research and Development efforts and by defining the goals and preparing the action plans accordingly. The Committee also desire that the Government should make sincere efforts for international tie-ups in the field of Hydrogen energy to take advantage of R&D work being undertaken in other parts of the world in this field.

13. 3.35 The Committee observe that the Programme on Alternate Fuel for Surface Transportation which includes research and development and demonstration of Battery Operated Vehicles (BOVs) using alternate fuels was launched during 1994-95. Till now, the Ministry have been successful in deployment of 161 BOVs (buses/mini-buses, three-wheelers and passenger-cars) in 15 states and three Union Territories at the cumulative expenditure of Rs. 14.88 crore. Now, during the year 2005-06, it has been decided by the Ministry to replace this programme by hybrid electric vehicle programme. Rs. 2.50 crore has been allocated for this programme during the year 2005-06. The Committee welcome this step of improvement. However, they are of the view that one of the major limitations of the existing vehicles using lead-acid batteries is the limited driving range of the vehicle per charge of the battery. The Committee, therefore, recommend that the Government should make all efforts to develop and deploy newer types of rechargeable batteries having higher capacity at lower costs through focussed R& D efforts.

14. 3.40 The Committee note that during the last several years, the Ministry has not been able to utilize the amount allocated for the Biomass gasifier programme. This shows the lack of proper attention by the Government on such an important programme. The Committee are of the view that the Ministry of Non-Conventional Energy Sources should be more specific in identifying the reasons for under achievements in the physical and financial field and then pursue their case on sound footing with the Ministry of Finance so that they may not be able to impose financial cut on the Biomass Gasifier Programme during the current financial year. The Committee, however, find that the target fixed for the programme is quite low particularly when the biomass generation potential is of the order of 19,500 MW and the technology to harness them is quite mature. The Committee, therefore, recommend that the Ministry should fix higher targets and allocate more budget for the Biomass gasifier programme from the next financial year so that the abundantly available biomass resources may be harnessed expeditiously in a time bound manner. To get better results, the Committee desire that the Governments should provide more

incentives to Village Panchayats interested in Biomass Gasifiers Programme.

15. 3.47 The Committee observe that the Ministry of Non-Conventional Energy Sources was able to utilise Rs. 11.95 crore only out of the Budget Estimates of Rs. 18 crore and Revised Estimates of Rs. 16.50 crore the Biomass Power/Co-generation programme during the year 2003-04. Similarly, during the year 2004-05 only, Rs. 5.78 crore could be utilised (upto February 2005) out of Rs. 14.54 crore of B.E. and Rs. 12.54 crore. One of the reasons as extended by the Ministry, for the difference in actual expenditure and Revised Estimates during the year 2003-04, was that the financial assistance was withheld at the end of the financial year due to cancellation of the signed Power Purchase Agreements by the State Government of Karnataka. Unfortunately, the issue was not resolved immediately and the actual utilisation during the year 2004-05 also got affected. As a result of which, the difference between RE and actuals increased from Rs. 4.55 crore during the year 2003-04 to Rs. 6.76 crore during the year 2004-05. The Committee, therefore, recommend that the Government should go into the details of the reasons for the cancellation of PPAs signed by the State Government of Karnataka and settle the problem once for all. The Committee also desire that preventive measures should be taken to stop such cancellations in future so that the actual utilisation of the allocated fund is not affected.

16. 3.48 The Committee have noted that the Biomass power/Co-generation programme are being implemented by the Ministry of Non-Conventional Energy Sources to exploit the estimated potential of 19,500 MW including 3,500 MW of exportable surplus power from bagasse-based Co-generation in sugar mills. As on 31.12.2004, 727.53 MW which includes 437.03 MW from bagasse Co-generation and 290.50 MW from biomass combustion projects have been set up in the country. This accounts for only 3.7 per cent of the total assessed potential of 19,500 MW. The Committee feel that the Ministry are not making much headway in harnessing the huge potential of biomass. Analysing the various problems associated with the programme, the Committee further noted that Co-generation projects are unable to obtain loans from the various financial institutions on account of poor financial position of most sugar mills especially Co-operative. Inadequate availability of biomass for the power projects are the other major problems. Sometimes, the project promoters are not paid in time for the electricity supplied by them in some States. The Committee, therefore, recommend that the Government should make all out efforts to rectify all these problems by convincing the various financial institutions to provide loans on softer terms to sugar mills,

especially the Co-operatives; promoting energy plantation having fast growing and high energy density biomass, giving directions to all potential states to issue attractive preferential tariff, wheeling and banking rates and third party sales and to pay in for their outstanding dues for the electricity supplied by them. The Government should consider a Single Window Clearance System for sugar factories intending to start co-generation projects. The Committee may be apprised of the various efforts made and resultant outcome thereof.

17	3.49	The Committee observe that as against the estimated potential of 120 lakh Biogas plants only 36.70 lakh plants have been set up in the country. The Ministry has not been able to achieve the targets set during the year 2003-04 and 2004-05. The Committee note that in some States Village Panchayats and Local Bodies are being associated with such activities. The Committee desire that Government should ensure more and more participation of these bodies in setting up of biogas plants to spread public awareness in the region. The Committee also desire that suitable tie-ups should be done with Dairy Organisations to harness the full potential.

PART II

APPENDIX-I

Statement showing the Demands for Grants (2005-06) of the Ministry of Non-Conventional Energy Sources
(Demand No. 65)
(*vide* Para 1.9 of the Report)

(Rs. in crore)

	Revenue	Capital	Total
	535.33	70.05	605.38

Sl. No.	Major Heads	Programme Scheme	Revenue Section								Remarks
			2003-04		2004-05				2005-06		
			Actual		BE		RE		BE		
			Plan	Non-Plan	Plan	Non-plan	Plan	Non-Plan	Plan	Non-Plan	
1	2	3	4	5	6	7	8	9	10	11	12
1.	3451	Secretariat Economic Services	5.24	5.51	6.91	5.47	6.91	5.47	8.25	5.63	This Head comprises wages, O.T.A., Domestic & Foreign Travel Expenses, Office Expenses, Rent, Rates Taxes, Publications, other Administrative Expenses, Advertising & Publicity, Professional Service, Commission for Additional Sources of Energy, Regional Office.
2.	2501	Special Programme for Rural Development	0.15	--	1.60	--	1.00	--	--	--	This Programme includes IREP Programme, Grants-in-aids for National & Regional Training Centre.

1	2	3	4	5	6	7	8	9	10	11	12
3.	2552	Lumpsum provision for North-Eastern Region and Sikkim	--	--	60.00	--	40.00	--	60.00	--	Lumpsum provision forn North-Eastern Region and Sikkim.
4.	2810	Non-Conventional Sources of Energy	265.50	--	417.13	--	259.86	--	450.73	--	This Head comprises R&D Non-Conventional Energy Sources, Bio-Energy assistance to Biomass Programme, National Programme for Biogas, Energy from Urban Municipal Waste, Energy from Industrial Waste, Small Hydro Power Development, SHP Promotion Programme, UNDP/GEF Hilly Hydro Projects, Chemical Sources of Energy, Alternative Fuel for Surface Transportation, Hydrogen Energy, Ocean Energy, National Institute of Renewable Energy, Special Area Demonstration Project, North—Eastern States/State Nodal Agencies, Dutch/ SDC Grants to IREDA, Lumpsum Provision for North-Eastern States including Sikkim, UNDP Rural Energy Support Programme, Rural Energy Entrepreneurship, Institutional Development, Technology Commercialisation Fund,

1	2	3	4	5	6	7	8	9	10	11	12
											Village Electrification Programme, Women and Renewable Energy Development, National Project on Clean Energy Services for Rural Areas, TIFAC, DEB Management System, Information and Public Programme, International Cooperation.
5.	3601	Grants-in-aid to State Government	20.83	--	15.59	--	20.57	--	9.19	--	This Head includes Grants-in-aids to State Governments for Small Hydro Power Programme, Wind Energy Grants for Central Sponsored Plan Schemes for Bio-Energy, Development, Advertising & Publicity, Community and Institutions, Biogas Development, Biomass Briquetting, Energy Plantation, Biomass Gasifier for Stand Alone Application, National Bio-Energy Board, Biomass Cogeneration and Combustion, Grid Connection Gasifier, Animal Energy Programme, Solar Passive Architecture, Regional Technical Back-up Units Training Programme, Solar Energy Centre, Inter-active Research with other Institutions/ Organisations, Professional Service, SPV

1	2	3	4	5	6	7	8	9	10	11	12
											Pump Programme, Solar Thermal Power Generation Grid connected ASPV Power Projects, GEF Grants for IS Project, Assistance to Wind Power Generation Programme, Assistance to Wind Power Programme, Wind Energy Centre, Wind Resources Assessment, National Programme on Improved Choolah, Women and Renewable Energy Development, Energy from Urban and Agricultural Wastes, National Programme for Biogas Development, Community and Institutional Biogas Development, Solar Thermal Energy Programme, National Programme on Improved Chulhas, Energy from Urban & Agriculture Wastes, Integrated Rural Energy Planning Programme, Monitoring, Lumpsum provision for North-Eastern States including Sikkim.
6.	3602	Grants-in-aid to Union Territory Government	2.03	--	2.53	--	1.62	--	1.53	--	This Head includes Grants for Central Plan Schemes for Wind Demonstrations, Grant for Centrally Sponsored Plan Scheme for NPB Community and Institutional Biogas Development, Solar Thermal

1	2	3	4	5	6	7	8	9	10	11	12
											Energy Programme, National Programme on Improved Chulhas, Integrated Rural Energy Programme Monitoring, National Project on Clean Energy Services for Rural Areas.
7.	--	Total Revenue	293.77	--	503.76	5.47	329.96	--	529.70	5.63	----
8.	4810	Capital Outlay on Non-conventional Sources of	40.04	--	50.04	--	50.04	--	50.05	--	This Head includes capital investment for minor works in the Solar Energy Centre and investment in Indian Renewable Energy Development Agencies (IREDA).
9.	6810	Loans for Non-Conventional Sources Of Energy	42.00	--	46.00	--	20.00	--	20.00	--	This Head includes counterpart loan to IREDA for International Development Association (IDA) and Danish Export Finance Corporation (DEFC) components of grants under India Renewable Resources Development Project of the Ministry implemented through IREDA.
10.	--	Total Capital	82.04	--	96.04	--	70.04	--	70.05	--	----
11.	--	Total (Gross)	375.81	--	599.80	5.47	400.00	5.47	599.75	5.63	--

ENERGY RECOVERY FROM URBAN AND INDUSTRIAL WASTES

It is estimated that about 30 million tonnes of solid waste and about 4400 million cubic meters of liquid waste are generated every year. Most of these wastes find their way into land and water bodies without proper treatment, leading to problems of environmental pollution with adverse effect on public health. A potential for generating about 1700 MW of power from urban/ municipal wastes [1450 MW from Municipal Solid Wastes (MSW) and 250 MW from Municipal Liquid Wastes (Sewage)] and about 1000 MW from various industrial wastes (both solids and liquids) has been estimated for the country. Waste-to-Energy projects, especially those for MSW, are a relatively new concept in India and state-of-the-art technologies in general are not indigenously available. The technologies of biomethanation of sewage and industrial wastes are well established, but those for municipal solid wastes are still under demonstration phase.

Indicative costs of projects based on different technologies are given below:

Technology	Cost/MW (Rs./ crore)
• Combustion/ Incineration	6-7
• Gasification/ Pyrolysis	8-10
• Biomethanation	
➢ Industrial waste	4-6
➢ Urban waste	10-12

Projects based on industrial wastes are generally commercially viable because of the lower installation costs, captive use of the generated biogas/ power and negligible cost of raw material. The viability of projects based on MSW, on the other hand, is critically dependent on the price realized for generated energy/ other bye-products, cost of disposal of the rejects/ residual waste, the EPC measures adopted, etc.

The Ministry has been implementing two programmes for recovery of energy from Urban and Industrial wastes. National Programme on Energy Recovery from Urban and Industrial wastes and UNDP/GEF assisted Project on 'Development of High Rate Biomethanation Processes as means of Reducing Green House Gases Emission'.

Appendix-II

Approved 10th Plan Outlays, Budget Estimates, Revised Estimates, Expenditure, Physical Targets and Achievement during 10th Plan from 2002-03 to 2004-05 (as on 31.12.2004) under various programme

Sl. No.	Programmes/Schemes	10th Plan Approved Outlay (Rs. in Crore)	10th Plan BE (2002-05) (Rs. in Crore)	10th Plan RE (2002-05) (Rs. in Crore)	10th Plan Expenditure (2002-05) as on 31.12.2004 (Rs. in Crore)	1 Targe
1	Wind power	110.00	40.39	21.40	18.96	15
2	Small Hydro Power	375.00	83.00	68.00	69.53	6
3	Biomass Power/Cogeneration	125.00	51.47	41.67	34.49	7
4	Solar Power					
	Solar Thermal Power	50.00	16.00	0.10	0.03	1
	Solar Photovoltaic Power	75.00	16.00	15.20	4.33	
5	Energy from U&I Wastes	125.00	49.00	28.04	19.77	8
6	Solar Thermal Programme	110.00	36.00	31.87	26.32	
	Solar water Heating Sys.					50 coll
	Solar Cooker					205
7	Biogas Plants (NBMMP) and	415.00	140.94	107.71	95.50	10 la
8	Biomass Gasification	35.00	20.00	10.60	9.87	5
9	SPV Programme	290.00	105.00	111.00	90.29	
	SPV Home Light					250
	SPV Lanterns					600
	SPV Power Plants and other systems (off grid)					40
10	Small Wind Energy & Hybrid Systems and other Systems	16.00	6.50	5.95	5.12	
	Wind Pumps					8
	Hybrid Systems					8
11	Integrated Rural energy Programme (IREP)	145.00	17.72	28.62	22.51	
12	SPV Water Pumps	217.00	64.00	69.50	55.44	80
13	Village Electrification Programme	735.00	303.50	178.17	122.74	500
			0.00	0.00		
14	SPV R & D	30.00	6.00	4.00	1.41	
15	New Technology	150.00	53.00	29.08	13.02	
16	TIFAC	15.00	4.50	2.00	1.27	
17	Technology Commercial Funds	10.00	3.30	0.11	0.14	
18	Rural Energy Entrepreneurship/Institutional Development	10.00	1.10	0.42	0.29	
19	International Cooperation	8.00	3.27	2.06	1.30	
20	Market Development & Export Promotion	12.00	1.80	0.53	0.02	
21	HRD & Training	15.00	5.50	4.00	3.95	
22	Regional Office	9.00	5.90	5.90	3.55	
23	State Nodal Agencies	6.00	1.75	1.15	1.82	
24	Seminars/Symposiun	5.00	1.05	1.05	0.49	
25	Women & Renewable Energy Development	6.00	0.58	0.59	0.45	
26	Special Area Demonstration Programme	60.00	19.55	13.90	8.77	
27	Plan secretariat		13.41	13.41	10.12	
28	Information & Publicity	30.00	15.00	13.00	9.87	
29	Solar Energy Centre	40.00	8.15	3.30	1.32	
30	NIRE	25.00	19.00	11.00	5.00	
31	Centre for Wind Energy Technology	15.00	15.70	13.70	14.10	
32	Equity IREDA	250.00	125.00	125.00	125.00	

33	North East Programmes		169.00	125.00	77.87	
34	Improved Chulha	10.00	0.85	3.68	3.01	
35	CBP/IBP	5.00	1.32	5.50	4.51	
	Total (DBS)	**3534.00**	**1424.75**	**1096.21**	**862.18**	
	Externally Added Projects (EAP)					
36	IDA-II	260.00	226.00	157.00	137.00	
37	UNDP-REG	6.00	6.50	5.50	3.38	
38	GEF Grant for Mathania Project	200.00	192.00	0.00	0.00	
	TOTAL (GBS)	**4000.00**	**1849.25**	**1258.71**	**1002.56**	
39	IEBR	3167.00	1418.07	1313.95	1182.20	
	Total outlay	**7167.00**	**3267.32**	**2572.66**	**2184.76**	

* It has been decided to discontinue the support for grid interactive solar power programme.

MINUTES OF THE TENTH SITTING OF THE STANDING COMMITTEE ON ENERGY(2004-05) HELD ON 23RD MARCH, 2005 IN COMMITTEE ROOM 139, PARLIAMENT HOUSE ANNEXE, NEW DELHI

The Committee met from 1630 hrs. to 1810 hrs.

PRESENT

Shri Gurudas Kamat -*Chairman*

MEMBERS

2. Shri Gauri Shankar Chaturbhuj Bisen
3. Shri Ajay Chakraborty
4. Shri Nandkumar Singh Chauhan
5. Shri Chander Kumar
6. Shri Prashanta Pradhan
7. Shri Rabindra Kumar Rana
8. Shri J.M. Aaron Rashid
9. Shri Kiren Rijiju
10. Shri M. Shivanna
11. Shri Vijyendra Pal Singh
12. Shri M.K. Subba
13. Shri E.G. Sugavanam
14. Shri Tarit Baran Topdar
15. Shri Chandrapal Singh Yadav
16. Shri Kamal Akhtar
17. Shri Vedprakash P.Goyal
18. Shri Bimal Jalan
19. Shri Matilal Sarkar
20. Shri Jesu Das Seelam

SECRETARIAT

1.	Shri Anand B. Kulkarni	-	Joint Secretary
2.	Shri P.K. Bhandari	-	Director
3.	Shri Surender Singh	-	Deputy Secretary
4.	Dr. Ram Raj Rai	-	Under Secretary

WITNESSES

Ministry of Non-Conventional Energy Sources

1.	Shri A.M. Gokhale	Secretary
2.	Shri A.K. Rath	AS & FA
3.	Dr. S.K. Chopra	Sr. Adviser
4.	Shri Sunil Khatri	Jt. Secretary
5.	Dr. E.V.R. Sastry	Scientist "G"
6.	Dr. K.C. Khandelwal	Scientist "G"
7.	Shri Ajit K. Gupta	Scientist "G"
8.	Dr. T.C. Tripathi	Scientist "G"
9.	Shri N.P. Singh	Scientist "G"
10.	Shri Sudhir Mohan	Scientist "G"
11.	Shri K.P. Sukumaran	Scientist "G"
12.	Dr. B. Bandopadhyay	Scientist "G"
13.	Shri Debashish Majumdar	MD (IREDA)
14.	Shri M.P. Ramesh	Executive Director (C-WET)

2. At the outset, the Chairman, Standing Committee on Energy welcomed the representatives of the Ministry of Non-Conventional Energy Sources to the sitting of the Committee and apprised them of the provision of Direction 58 of the Directions by the Speaker.

3. The discussion started with a detailed presentation by the Ministry on the various aspects pertaining to the promotion and development of renewable energy sector. The following important points were discussed by the Committee:-

(i) Physical and financial performance of the Ministry during the year 2004-05 and Goals set for the year 2005-06,

(ii) Remote Village Electrification Programme including Village Energy Security Programme through various sources of renewables,

(iii) Biomass Power/Cogeneration Programme and the problems associated therewith,

(iv) Biomass Gasifiers Programe- steps taken to expedite the programme,

(v) Wind Energy Programme - promotion and development thereof,

(vi) Solar Energy Programme –research and development thereof,

(vii) Formation of District Advisory Committee for monitoring various renewable energy programmes at the district level;

(viii) Training and various awareness programmes for the promotion and development of renewable energy programmes.

4. A copy of the verbatim proceedings of the sitting of the Committee has been kept on record.

The Committee then adjourned.

MINUTES OF THE TWELFTH SITTING OF THE STANDING COMMITTEE ON ENERGY(2004-05) HELD ON 11TH APRIL, 2005 IN COMMITTEE ROOM 'E', PARLIAMENT HOUSE ANNEXE, NEW DELHI

The Committee met from 1500 hrs. to 1630 hrs.

PRESENT

Shri Gurudas Kamat -*Chairman*

MEMBERS

2. Shri Gauri Shankar Chaturbhuj Bisen
3. Shri Ajay Chakraborty
4. Shri B. Vinod Kumar
5. Shri Chander Kumar
6. Shri Prashanta Pradhan
7. Shri Rabindra Kumar Rana
8. Shri Kiren Rijiju
9. Shri Vijayendra Pal Singh
10. Shri E.G. Sugavanam
11. Shri Tarit Baran Topdar
12. Shri Sudarshan Akarapu
13. Shri Vedprakash P. Goyal
14. Shri Bimal Jalan
15. Dr. K. Kasturirangan
16. Shri V. Hanumantha Rao

17. Shri Matilal Sarkar

18. Shri Motilal Vora

SECRETARIAT

1.	Shri Anand B. Kulkarni	-	Joint Secretary
2.	Shri P.K. Bhandari	-	Director
3.	Shri Surender Singh	-	Deputy Secretary
4.	Dr. Ram Raj Rai	-	Under Secretary

4. At the outset, the Chairman, Standing Committee on Energy welcomed the Members to the sitting of the Committee.

5. The Committee then took up for consideration the following draft Reports:

(i) Draft Report on the Demands for Grants(2005-06) of the Ministry of Power.

(ii) Draft Report on the Demands for Grants (2005-06) of the Ministry of Non-Conventional Energy Sources.

6. The Committee adopted draft Reports with minor additions/deletions/amendments suggested by the Members of the Committee.

7. The Committee also authorised the Chairman to finalise the above-mentioned Reports after incorporating the amendments suggested by the Members of the Committee and making consequential changes arising out of factual verification by the concerned Ministries and to present the same to both the Houses of Parliament.

The Committee then adjourned.