27

STANDING COMMITTEE ON ENERGY

(2011-12)

FIFTEENTH LOK SABHA

MINISTRY OF NEW AND RENEWABLE ENERGY

DEMANDS FOR GRANTS
2012-13

TWENTY-SEVENTH REPORT

LOK SABHA SECRETARIAT
NEW DELHI

May/Vaisakha, 1934 (Saka)

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Presented to Lok Sabha on 03.05.2012

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@ Ceased to be member of the Committee w.e.f. 15.02.2012

Ceased to be member of the Committee w.e.f. 2nd April, 2012

INTRODUCTION

I, the Chairman, Standing Committee on Energy having been authorized by the Committee to present the Report on their behalf, present this Twenty-Seventh Report on Demands for Grants of the Ministry of New and Renewable Energy for the year 2012-13.

2. The Committee took evidence of the representatives of the Ministry of New and Renewable Energy on 12th April, 2012. The Committee wish to express their thanks to the representatives of the Ministry for appearing before the Committee for evidence and furnishing the information, desired by the Committee in connection with examination of Demands for Grants (2012-13).

3. The Report was considered and adopted by the Committee at their sitting held on 25th April, 2012.

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

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

NEW DELHI
2nd May, 2012
Vaisakha 12, 1934 (Saka)

MULAYAM SINGH YADAV
Chairman,
Standing Committee on Energy

REPORT

PART I

NARRATION ANALYSIS

I INTRODUCTORY

1.1 Energy is a vital input for economic growth. However, rapid growth of GDP will lead to an increased energy consumption. More so as large sections of the population are already without adequate access to energy. Currently, India has an installed capacity of 185496.62 MW (as on 30.11.2011), out of which 22300 MW accounts for new and renewable source of energy mainly from wind and small hydro units. It is expected that India's peak demand will rise to 335000 MW by 2017. Keeping in view the increased demand , inability to meet the capacity addition targets, need for access of electricity to all and to reduce dependence on conventional sources of energy, there is a growing need to look forward, in a definite way towards the renewable energy sources., When the issue is viewed holistically from the perspective of energy security, energy access, climate change, immense potential of the renewal resources in India, it becomes crucial to develop the renewable sources of energy. Development of renewable energy should be central to any Plan for economic growth.

1.2 The Ministry of New and Renewable Energy (MNRE) is the nodal Ministry of the Government of India for all matters relating to new and renewable energy. The broad aim of the Ministry is to develop and deploy new and renewable energy for supplementing the energy requirements of the country. The Ministry has been facilitating the implementation of broad-spectrum programmes covering more or less the entire range of new and renewable energy. These programmes broadly seek to supplement conventional fossil-fuel –based power through harnessing wind, solar, small hydro and bio power; take renewable energy systems to remote rural areas for lighting, cooking and motive power; use renewable energy in urban, industrial and commercial applications; and develop alternate fuels and applications for stationary, portable and transport uses apart from supporting research, design and development of new and renewable energy technologies, products and services.

1.3 The Ministry of New and Renewable Energy (MNRE) is a Scientific Ministry which has been allocated the following subjects/business under the Allocation of Business Rules:

- Research and development of biogas and programmes relating to biogas units;

- Commission for Additional Sources of Energy (CASE) (*non-functional since beginning of 11th Plan);*
- Solar Energy - including solar photovoltaic (SPV) devices and their development, production and application;
- All matters relating to small/mini/micro hydel projects of and below 25 MW capacity;
- Programmes relating to improved chulhas and research and development thereof *(transferred to States at the end of 9th Plan)*;
- 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) *(transferred to States w.e.f.11th Plan)*;
- Geothermal Energy
- Bio-fuels: (i) National Policy; (ii) Research, development and demonstration on transport, stationary and other applications; (iii) setting up of a National Bio-fuels Development Board and strengthening the existing institutional mechanism; and (iv) overall coordination concerning bio-fuels.

1.4 In their Annual Plan 2012-13, the Ministry of New & Renewable Energy have stated that starting with the 9th Plan, there has been consistent increase in the pace of renewable energy development and the sector has grown at an annual rate of 23% rising from about 3900 MW in 2002-03 to about 22,300 MW in November, 2011. Wind energy continues to dominate India's renewable energy industry, accounting for 70% of installed capacity (15,800 MW), followed by small hydro power (3200 MW), biomass power (3100 MW) and Solar power (145 MW). In terms of electricity generation, with normative capacity utilization factors, the renewable power installed capacity is generating around 49 BU per year corresponding to about 6% in total electricity mix and 11% of total capacity in 2010-11. This share has increased to 12.9% at the end of 2011-12.

II. STATUS OF IMPLEMENTATION OF RECOMMENDATIONS CONTAINED IN THE EIGHTEENTH REPORT OF THE STANDING COMMITTEE ON ENERGY ON DEMANDS FOR GRANTS (2011-12) OF THE MINISTRY OF NEW AND RENEWABLE ENERGY.

1.5 The Eighteenth Report of the Standing Committee on Energy on Demands for Grants (2011-12) pertaining to the Ministry of New & Renewable Energy was presented to Parliament on 17th August, 2011 and the related Action Taken Report i.e. Twenty-fourth Report was presented to Parliament on 29th December, 2011.

1.6 The current status of implementation of the recommendations contained in the Eighteenth Report of the Committee on Demands for Grants (2011-12) could not be assessed as the Minister of New & Renewable Energy is yet to lay a statement in Parliament under Direction 73A of Directions by the Speaker.

1.7 The Eighteenth Report contained 8 recommendations out of which the Government accepted 6 recommendations and 2 recommendations were commented upon by the Committee.

1.8 The MNRE furnished their final Action Taken Statement on the recommendations contained in the Twenty-fourth Report of the Committee, on 30th March, 2012.

III. ELEVENTH FIVE YEAR PLAN – PERFORMANCE APPRAISAL

1.9 Against the 11th Plan (2007-2012) allocation of Rs.4000 crore, the actual budget provision made available to the MNRE during the entire Plan Period has been Rs.4068 crore at BE level. The actual 11th Plan expenditure against the same has been Rs. 3798.36 crore.

1.10 Scheme/Programme-wise budgetary allocation for 11th Plan in new and renewable energy sector is as under:

	Rs. in crore
▪ Grid-Interactive & Distributed Renewable Power	1,560
▪ Renewable Energy for Rural Applications	900
▪ Renewable Energy for UIC Applications	275
▪ Research, Design & Development	600
▪ Support Programmes	575
▪ Externally aided Programmes (EAP)	50
▪ Spill-Over Liabilities	40
Total	4,000

1.11 Year-wise and programme-wise details of financial allocations and expenditure during the 11th Plan Period are given in ***Annexures I & II*** and that of physical targets and achievements in ***Annexure III***.

1.12 The details of the 11th Plan Allocation and expenditure thereof, year-wise, as furnished by the Ministry of New and Renewable Energy are given below :

(Rs. in crore)

Year	Outlay BE	Revised Estimate RE	Expenditure	Expenditure as % of BE
2007-08	628.00	483.00	478.72	76.23%
2008-09	620.00	499.00	441.79	71.26%
2009-10	620.00	560.00	548.83	88.52%
2010-11	1000.00	995.00	980.20	98.02%
2011-12	1200.00	1360.80	1348.83	112.40%
Total	4068.00	3897.80	3798.37	93.37%

1.13 The Committee desired to know about any shortfall in achieving the physical and financial targets during 11th Five Year Plan and the reasons for such shortfalls. The Ministry informed that there was no significant shortfall in physical targets as the achievements were generally above 90 per cent of the targets.

1.14 On being asked about the major achievements during the 11th Plan Period, the Ministry in a note stated:

> "Major physical achievements during the plan period under the 5 umbrella programmes of the 11th Plan have been as under (as on 29.2.2012)":
>
> - **Grid-interactive renewable power generation:**
>
> Total capacity addition of about 13,125 MW against plan target of 11,230 MW.
>
> - **Off-Grid/ Distributed Renewable Power:**
>
> Over 500 MWeq aggregate capacity of decentalised sytems comprising:
>
> Biomass (Non-bagasse) co-generation projects aggregating over 317 MW
> Biomass gasifier systems aggregating 63 MW_{eq}
> SPV systems aggregating 37 MW_{p}
> Waste to energy plants aggregate capacity of 82 MW_{eq}

- **Renewable Energy for Urban, Industrial & Commercial Applications:**

  Deployment of solar thermal systems with total collector area of 3.15 mln. sqm.

- **<u>Renewable Energy for Rural Applications:</u>**

  Deployment of 5.69 lakh family biogas plants
  Lighting/ electrification of 5787 villages/ hamlets through Renewable energy systems, mainly SPV, under Remote Village Electrification programme."

IV. PERSPECTIVE PLANNING OF 12TH FIVE YEAR PLAN

1.15 As per the Annual Plan 2012-13 of the Ministry of New and Renewable Energy for the year 2012-13 will be first year of the 12th Five Year Plan. It would essentially lay foundation for the approach, activities and programmes envisaged for the next five years and may be beyond. Renewable energy sector is now seen as significant player in the grid connected power generation and an essential player for energy access. Renewable energy will support the Govt. agenda of 'inclusive growth' and will be part of the solution to meet the nation's energy needs. The 12th Plan of the Ministry of New & Renewable Energy is aiming towards addressing issues for accelerated exploitation of renewable energy potential. The focus would continue on development and deployment of renewable energy generation systems, wherever feasible and viable, for rural, urban and industrial/commercial applications, apart from grid-interactive renewable power.

1.16 While deposing before the Committee, the Secretary, Ministry of New and Renewable Energy intimated about the progressive development of new and renewable energy sector, perspective planning for 12th Five Year Plan and fund crisis and its management for the current year, as under:

> "…the Ministry of New and Renewable Energy is mandated to push the spread and greater utilisation of renewable energy in our country. The major sources that we tap are wind, biomass, bio energy, solar, etc. It includes small hydro area also. We are just entering the field of looking at other sources like geothermal and even tidal. But these are at very nascent stage. In terms of the four major areas, we have shown tremendous amount of progress in the last five years. In the preceding five years, we began the Tenth Plan with a capacity of 3000 MW roughly. Today, the installed capacity from renewable is 25,000 MW. As per our Working Group's deliberations and recommendation, we have to increase it to 30,000 MW over the next five years that is the 12th Plan. This is an additional 30,000 MW. In 1982, our Ministry was formed. From 1982 till date, we have reached 25,000 MW that is, in 30 years. In five years, we propose to add another 30,000 MW. This is a very ambitious target. To that end, we had requested for a substantial outlay of Rs.40,000 crore. 12th Plan has not yet been finalised...."

1.17 The Ministry of New and Renewable Energy have informed that the 12th Plan proposal of the Ministry have been submitted to the Planning Commission and are yet to be approved. The programme-wise projections of physical and financial targets for the 12th Plan as furnished by the Ministry are given at **Annexure – IV**.

1.18 The Committee intended to know the present share of installed capacity of new and renewable energy sources in the total installed capacity of power sector in India. The Ministry in a note informed as under :

> "The share of renewables in total installed capacity from all sources as on 28.02.2012 is about 12.19 per cent.

Source	**Present installed capacity (as on 28/2/12)**	**Share in total installed capacity**
Conventional:		
Hydro	38,848	
Thermal	1,24,731	
Nuclear	4,780	
	1,68,359	**87.81%**
Renewable:		
Wind power	16,321	
Small Hydro	3,342	
Bio Power	3,212	
Solar Power	504	
	23,379	**12.19%**

1.19 On being enquired about the projected share at the end of the 12th Five Year Plan, the Ministry stated as under:

> "At the end of the 12th Five Year Plan the installed capacity from conventional sources including nuclear is likely to reach 2,50,000 MW, whereas that from renewable sources 53,120 MW. The share of renewables will accordingly correspond to about 17.5% in the total installed capacity from all sources in the country. Details are as under:

Source	Projected installed capacity at the end of 12th Plan	Share in total installed capacity
Conventional:		
Hydro	~ 52,200	
Thermal	~1,90,000	
Nuclear	7,580	
	2,49,780	**82.45%**
Renewable:		
Wind power	31,500	
Small Hydro	5,490	
Bio Power	5,530	
Solar Power	10,600	
	53,120	**17.55%**

V. ANALYSIS OF DEMANDS FOR GRANTS OF MNRE FOR 2012-13.

1.20 The MNRE presented Demand No. 68 to Parliament for the financial year 2012-13 on 16th March, 2012. The Plan and Non-plan provisions made in the Revenue and the Capital Sections of the Budget are as under:

Demand No. 68

(Rs. in crore)

	Plan	Non-Plan	Total
Revenue Section	1291.00	14.79	1305.79
Capital	92.00	-	92.00
Grand Total (Revenue + Capital)	1383.00	14.79	1397.79

(Expenditure provisions, net of the recovery of Rs.40.43 crore under Revenue Section which are adjusted in reduction of expenditure)

1.21 A statement showing the details of the Budget Estimates for the year 2012-13 vis-à-vis that of Budget Estimates/Revised Estimates (BE/RE) of 2011-12 and Actuals of 2010-11 is given at ***Annexure-V.***

1.22 The Central Plan Outlay of the Ministry of New and Renewable Energy during the year 2011-12 and for the year 2012-13 are given below.

(Rs. in crore)

	2011-12		2012-13
	BE	RE	BE
Budgetary Support	1200.00	1360.00	1385.00
IEBR	950.00	1755.64	1970.00
Total	2150.00	3116.44	3355.00

1.23 The total outlay of the Ministry for the financial year 2012-13 is Rs.3355 crore. Out of this, the Internal and Extra Budgetary Resources (IEBR) constitutes Rs. 1970 crore and Gross Budgetary Support (GBS) accounts for Rs. 1385 crore. A detailed statement in this regard as provided by MNRE is given at ***Annexure-IV.***

1.24 Explaining the budgetary allocation for 2012-13, the Secretary, MNRE submitted before the Committee during evidence:

> "…The first year of the Plan was to start off. What we had projected for the first year (2012-13) under the 12th Plan over Rs.5000 crore. After interactions and deliberations with the Planning Commission, we agreed to bring it down to Rs.2989 crore. But the final allocation has been only Rs.1385 crore. Rs.1385 crore is really at the same level that we got last year..."

1.25 Budget proposals and allocation for 2012-13, as furnished in the MNRE are given below:

Rs. in crore

Proposed:	5582
Break-up:	2022 for National Solar Mission (NSM) 2060 for other programs 1500 for Transmission Infrastructure
After discussion in Planning Commission	2979
Break-up:	1722 for NSM 1257 for other programs
Actual Allocation	1385
Internal distribution:	624 for NSM 761 for other programs

(Rs. in crore)

Programme Component	**Proposed Outlay**			**Allocation*** (Solar + Other)	
	Solar	**Other**	**Total**		
Grid-Interactive Renewable Power Transmission Infrastructure	310 -	570 1500	880 1500	375 -	(80 + 295) -
Off-Grid / DPRS	560	94	654	450	{405 + 45}
RE Rural Applicagtions	68	273	341	175	(5+168)
RE for UIC Applications	254	100	354	22	(12+10)
Research & Development in RE	230	224	454	194	(106+88)
Supporting programmes	600	766	1366	149	(16+133)
Domestic Budgetary Support (DBS)	2022	3527	5549	1365	(624+741)
External Aided Projects (EAP)	-	33	33	20	(0+20)
Gross Budgetary Support (GBS)	2022	3560	5582	1385	(624+761)

**Internal distribution of Actual Total Budget Allocation of Rs.1385 cr.*

1.26 The Committee desired to know if the Central Plan Outlay for the year 2012-13 was sufficient to meet the budget requirements during the year. The Ministry in a written note stated:

> "The total allocation to this Ministry for Annual plan 2012-13 is only Rs. 1385 cr. against total requirement of Rs. 2979 cr. It represents only a nominal 15% hike over last year's allocation and is considered inadequate for up scaling of activities envisaged under various programmes of the Ministry."

1.27 The Annual Plan outlay including Budgetary Support and Internal and Extra Budgetary Resources (IEBR) for the last three years with BE/RE and actual break-up are shown below:

(Rs. in Crore)

	2009-10			2010-11			2011-12		
	BE	**RE**	**Actual**	**BE**	**RE**	**Actual**	**BE**	**RE**	**Actual**
GBS	620	560	550.68	1000	995.00	982.05	1200	1360.80*	1348.83**
NET IEBR	726.78	939.07	1221.27	950	1496.65	*1400.85*	950	1755.64	2301.00 (Provisional)
Total Outlay	**1346.78**	**1499.07**	**1771.95**	**1950**	**2491.65**	**2382.90**	**1950**	**2953.64**	**3649.03**

* *including Rs.162.80 crore from National Clean Energy Fund (NCEF)*

** *including Rs.160.80 crore from National Clean Energy Fund (NCEF)*

1.28 On being asked about the heads which could not get the required amount leading to less or non-achievement of the targets, the Ministry in a written reply stated:

> "SPV Off-Grid programme**:** Against a target of sanctioning of 100 MW_p capacity equivalent of Off-grid Solar Photovoltaic projects during 2010-11 and 2011-12 under the Jawaharlal Nehru National Mission, projects aggregating to 118.12 MW_p have been sanctioned. The Ministry's contribution towards CFA was about Rs. 562.94 cr. and it released an amount of Rs. 155.04 cr. during 2010-11. During 2011-12 Ministry sanctioned projects having CFA of Rs. 893.5 cr. and released an amount of Rs.189.52 cr.
>
> As such, while CFA totaling Rs. 1486.44 cr. has been sanctioned towards 118.12 MW_p aggregate capacity projects during the two years, the CFA actually released has been only Rs.344.56 cr., leading to creation of a committed CFA liability of Rs.1141.88 cr. towards these projects. Provision for same will have to be made in addition to that towards new projects of about 82 MW_p that would need to be sanctioned during 2012-13 if the total Off-grid target of 200 MW of Phase-1 of the Mission is to be met. However, a target of only 30 MW_p has been fixed for 2012-13 as the allocation of funds for the year is only Rs. 332 cr."

1.29 The Committee further asked about quarter-wise expenditure made during last four years, The Ministry furnished the following information:

(Rs. in crore)

Year	BE	RE	1st Quarter	2nd quarter	3rd quarter	4th Quarter	Total
2008-09	620	499.40	15.63	168.78	106.24	151.14	441.79
2009-10	620	560	108.60	143.58	129.45	169.05	550.68
2010-11	1000	995	260.12	276.29	234.77	210.87	982.05
2011-12	1200	1360.80	271.49	403.07	180.85	493.42	1348.83

1.30 When enquired whether the expenditure during the last four years was as per the plan and norms, the Ministry replied

> "Only in 2008-09, the first quarter expenditure was quite less and the expenditure thereafter over the last three years were well distributed over the four quarters."

1.31 Submitting before the Committee about the budget utilization for last three years and present allocation as also efforts to approach Ministry of Finance and Planning Commission, the Secretary, MNRE stated:

> "...I know that Budget utilisation may not be one of the best ways that you can measure the performance but it is one benchmark of appraising the performance. If you look at our budget utilisation, against BE, we have already done 112 per cent and over RE, it is almost 98 per cent. This has been consistent over the last three years. We have been utilising the budget funds to the fullest extent. Be that as it may, we have taken the figure of Rs.1385 crore although we are taking up with the Ministry of Finance and the Planning Commission both of them, to at least increase our budget by a minimum of Rs. 1000 crore so that we can take the initiative right in the first year of the 12th Plan and increase our coverage in terms of schemes and programmes. However, the reality at present is that we have Rs.1385 crore and we had tried our best to meet our inter-se priorities and try and allocate this particular Budget allocation to the extent possible. We are trying to balance the various priorities and commitments that we have..."

VI. MAJOR PROGRAMMES OF NEW AND RENEWABLE POWER

E. Renewable Power - Grid and Off-Grid Programmes

1.32 As per the Ministry of New and Renewable Energy Annual Plan 2012-13, the Ministry have proposed a physical target of 4381 MW with an outlay of Rs.3034 crore for grid interactive/off grid renewable power generation as per the following break-up:

S. No	Programme Component	Physical target (MW)	BE 2012-13 *(Rs. in crore)*
(A).	**Grid-interactive (MW)**		
1	Wind Power	2500	100
2	Small Hydro Power	350	340
3	Solar power	800	310
4	Biomass Power (Combustion)	100	10
	Biomass Power (Gasification)	15	5
	Bagasse Cogeneration	350	70
	Urban / Industrial Waste to Energy	50	45
5	Transmission infrastructure	--	1500
	Sub-total (A)	**4165 MW**	**2380**
(B).	**Off-Grid/DRPS (MW)**		
1	Solar applications (SPV)	100	560
2	Energy from Urban/ Municipal/Industrial Wastes	*	*
3	Non Bagasse Cogeneration in Industry	80	15
4	Biomass Gasifier- Rural electrification (No. of Villages) 1000 Villages	3	9
5	Biomass Gasifier for Industry	20	5
6	Biogas based energy	6	30
7	Micro hydel and water mills 25 MW; 2000	5	20
7	Aero-generators /Hybrid systems	2	15
	Sub-Total (B)	**216MW**	**654**
	Grand Total (A) + (B)	**4381**	**3034**

* Included in grid – interactive at S.No.5

1.33 According to the Ministry, the total approved outlay for Grid Interactive and Off Grid/Distributed Renewable power for the year 2012-13 is Rs.825 crore. The details of various component schemes/programmes along with associated physical targets and financial outlays are given below:

Rs. in crore

Programme Component	**Initial/ Proposed Target 2012-13 (MW)**	**Funds required (Rs./cr.)**	**Funds Allocated (Rs./cr.)**	**Revised target (MW)**	**Shortfall of funds w.r.t. revised target (Rs./cr.)**
Grid-interactive Renewable Power					
Wind Power	2550	100	45	2500	55
Small Hydro Power	350	340	150	350	190
Bio-Power	515	130	100	485	5
Solar Power	800	310	80	800	230
Total	**4165**	**880**	**375**	**4135**	**480**
Transmission infrastructure	-	**1500**	-	-	-
Distributed/Off-Grid Renewable Power					
SPV systems	100	560	300 (+32 from NCEF} + 105	30	
U&I WTE	{20-included In Grid power}	-	6	20	
Non-bagasse Cogen.	80	15	7	60	
Gasifiers- Industrial	20	5	3	10	
Gasifiers – Rira;	3	9	4	1.5	
Microhydel/Watermills	5	20	14	2	
Aero gens/Hybrid systems	2	15	2	0.50	
Biogas to power	6	30	9	2	
TOTAL	**216**	**654**	**450**	**126**	

1.34 The physical target vis-a-vis achievement along with the BE/RE and actual expenditure during the year 2011-12 under Grid-interactive and off grid Renewable power as furnished by the Ministry are shown below.

S. No.	Programme Component	Physical Target *(MW)*	Physical Achievements *(As on 29-2-12)*	BE/RE 2011-12 *(Rs. in cr.)*	Actual Expenditure *(Rs. in cr.)*
(A)	**Grid-interactive**				
1	Wind Power	2400	2166	33/23	22.50
2	Small Hydro Power	350	300	135/150.7	150.41
3	Biomass Power (Combustion/Gasification) Bagasse Cogeneration	460	458	61/61	60.79
4	Urban/ Industrial Waste to Energy	25	17		
5	Solar Power	200	468 (incl. States own initiatives)	55/41.4	41.40
	Sub-total	**3435**	**3409**	**284/276.1**	**275.10**
(B)	**Off-Grid/DRPS**	**(MWeq)**			
1	Solar Mission systems	20	11	430/428	426
2	Energy from Urban & Ind. Wastes	15	28	31/27	26.98
3	Non Bagasse Cogeneration in Industry	80	64		
4	Biomass Gasifiers- Industrial	3	11.39		
5	Biomass Gasifiers – Rural	10			
6	Watermills with Generators	2.50 (400 nos.)	2.10 (350 nos.)	4/4	4.00
7	Aero-generators/Hybrid systems/Wind Pumps	0.50	0.38	5/5	5.00
	Sub-Total	**128.50**	**116.46**	**470/464**	**461.98**

Reports for the month of March 2012 are awaited and no major shortfall is anticipated.

1.35 During the evidence, the Secretary, MNRE spelt out certain facts/issues which emerged out during course of the implementations of their programmes especially regarding co-operation from State Governments, evacuation of power, inability of the States to absorb power and training of local youth. He submitted before the Committee:

> "As far as waste to energy is concerned, Supreme Court gave us permission for 5 projects to be proceeded with. We are proceeding with those projects. In the case of Delhi…(some) people are now saying there is no odour, there is no noise, no pollution with this…So, we are watching this programme…However, …it requires a very proactive participation by the municipal authorities…
> The landscape in Rajasthan has changed completely…acres and acres of solar panels (are installed) and they are supplying to Power Grid…this is fantastic because the land has no alternative use. You are not using it for agriculture. It is very rocky and it is ideal for setting up Solar Photo Voltaic Panels."

1.36 The Secretary further admitted that there is a problem of evacuation in Rajasthan and submitted before the Committee:

> "…now with solar power in Rajasthan, there is a limit to which Rajasthan will be able to absorb solar power. We have already given this work to Power Grid Corporation to submit a detailed Report by the end of this month incorporating major areas of Renewable Grid Connected Power, its actual plan, cost to be incurred and how to direct the power for absorption in National Grid..."

1.37 In regard to Laddakh, the Secretary stated:

> "If we develop a very large solar grid connected system there, the evacuation of power would require a major 220 double circuit line to be installed there in Leh. Investment in large-scale solar PV in Laddakh valley will make sense."

1.38 In regard to evacuation constraints of wind power in Tamil Nadu, the Secretary informed the Committee:

> "Wind development has been very good in Tamil Nadu, but evacuation is a problem. Beyond a point Tamil Nadu is unable to absorb that power and the power remains infirm….You may have seen that we had kept Rs.1500 crore for transmission infrastructure so that we could transmit excess power outside the State by absorption in the Grid as the State Government did not have funds, …But we were told that transmission is the job of Power Ministry."

1.39 In reply to a question about training of local youth in Rajasthan, Secretary, MNRE informed the Committee:

> "…The expansion of solar PV projects in Rajasthan, especially in districts like Jodhpur, Jaisalmer and some others, will lead to a large demand for technically qualified technicians. We had requested the Rajasthan Government that if the ITIs of those areas train them, we will pay them money. We will give the budgetary support to them. We have made it clear. We just need a proposal because tomorrow what is going to happen, you know very well that these people will put up plants. The technicians will be coming from the States; I do not want to mention the States. Whereas, we would have lost an opportunity to have increased job opportunities within those districts."

B. National Solar Mission

1.40 In November, 2009, the Govt. of India approved the "Jawaharlal Nehru National Solar Mission" which aims at development and deployment of solar energy technologies in the country to achieve parity with grid power tariff by 2022. The Mission targets include (i) deployment of (a) 20,000 MW of grid connected solar power by 2022, (b) 2,000 MW of off-grid solar applications including 20 million solar lights by 2022, (c) 20 million sq.m. solar thermal collector area, (ii) creation of favourable conditions for developing solar manufacturing capability in the country; and (iii) supporting R&D and capacity building activities to achieve grid parity by 2022. The Mission would be implemented in three phases, first phase being upto March, 2013.

1.41 Regarding the physical planning and achievement so far during the first phase of the Solar Mission, the Ministry in their written replies stated:

> "A target of 1100 MW capacity addition of grid connected solar power generation was fixed for phase I of the Mission. This included 1000 MW capacity of projects connected to 33 KV or above grid and 100 MW capacity connected to less than 33 KV grid. Entire capacity has been allocated. The SPV projects were selected in two batches. In Batch 1, a capacity of 150 MW was selected, while 350 MW capacity was selected in Batch II. Entire capacity of 470 MW of solar thermal power projects was selected during Batch I only. The SPV power projects selected in Batch I were to be commissioned by March 2012, while the solar thermal power projects by May 2013. The SPV power projects selected in Batch II are to be commissioned by February 2013. In all, over 205 MW capacity has been installed. In addition, 303 MW capacity has been installed under States' programme, thus bringing the total capacity installed in the country to 508 MW.
>
> A target of 200 MWp capacity equivalent off-grid solar photovoltaic systems was fixed for the first phase of Jawaharlal Nehru National Solar Mission (JNNSM) from 1st April, 2010 to 31st March, 2013. The Ministry sanctioned SPV projects aggregating to 40.65 MWp during 2010-11 against a target of 32 WMp and during 2011-12 projects aggregating to 77.47 MWp have been sanctioned against a target of 68 MWp. As per the reports received from various implementing agencies projects of 25 MWp equivalent capacity have been installed during 2010-11 and 2011-12. A target of 30 MWp has been fixed during 2012-13 as the allocation of funds is only Rs. 332 crores for the year. There has been no shortfall in achieving the physical target of the Off-grid- Solar PV Applications. However, the target for 2012-13 has been reduced due to non availability of funds during the year.
>
> For solar thermal applications, a cumulative target of 7 million square meter collector area was fixed for the phase I of the Mission. The total solar collector area installed till 2010-11 was 4.47 million square meter, and additional collector area

installed during the current year is 5.3 million square meter as per reports available so far. With this, the total cumulative area installed becomes 5.1 million square meters."

1.42 In connection with the R& D activities in Solar energy harnessing, the Ministry stated that:

"Research & development activities were provided an impetus under Mission. Support has been provided by the Ministry for setting up Centers of Excellence in thematic research areas, and five such Centres at IIT Bombay, IIT Rajasthan, IIM Bangalore, Amrita University, Cochin and CEPT University, Ahmedabad have so far been approved. The Ministry also developed collaboration with CSIR with a view to have synergy in research activities at their end and the objectives of the Mission. In addition, 35 research projects are under implementation at various Universities and research institutions including industries. In order to further develop R&D activities as per objectives of the Mission, Solar Energy Research Advisory Council under the chairmanship of Dr. Anil Kakodkar has had two meetings during the year."

1.43 When asked about the budgetary allocation vis-à-vis actual expenditure relating to solar energy during the first phase, the Ministry furnished as under:

"The BE-RE provisions and the actual expenditure during 2010-11, 2011-12 and 2012-13 are given below:-

(Rs. in crore)

S. No.	**Programme**	**2010-11**		**2011-12**		**2012-13**
		BE/RE	**Expd.**	**BE/RE**	**Expd.**	**BE**
1.	Grid-connected Solar Power	30/30	29.94	55/41.50	41.40	80
2.	Off-Grid SPV Systems	227.49/254.99	254.50	390/486.50	458.64	405
3.	Solar Water Heating	15/30	30	40/106.50	106.50	
4.	Solar R &D	64.8/64.8	64.79	39.75/52.75	52.75	77
5.	Energy-efficient buildings and solar cities	10/7	6.88	10/7	6.91	12
	Total		**386.11**		**666.2**	**574**

1.44 The Committee desired to know the action Plan of the Ministry for achieving the physical and financial targets of the Ist phase of the Mission for which the year 2012-13 is the terminal year. The Ministry responded in their written replies as under:

> "Entire capacity of grid connected solar power projects have been allocated as per target of Phase I of the Mission. The projects are under implementation, and it is planned to have interactive meetings with financial institutions with a view to provide them exposure on the experience and other related issues so that they have more confidence in financing the projects. An amount of Rs.80 cr. is earmarked for grid power projects during 2012-13. The network of solar radiation monitoring stations will be further strengthened and an initial draft of Solar Atlas is planned for the year so that more data on solar radiation resource is available to the developers. New projects are envisaged under R&D in thrust areas, besides support, monitoring and review of on-going projects. An amount of Rs.77 cr. is available for R&D activities.
>
> During 2012-13, an amount of Rs.332 cr. has been allocated for this Off-grid Solar PV programme. Therefore, the target for the year has been reduced from 100 MW_p to 30 MW_p."

C. Remote Village Electrification Programme (RVEP)

1.45 The Ministry is implementing Remote Village Electrification Programme (RVEP) for providing financial support for lighting/basic electrification in those remote unelectrified census villages and unelectrified hamlets of electrified census villages where grid extension is not found feasible by the State Governments and hence are not covered under the Rajiv Gandhi Gramin Vidyutikaran Yojana. Such villages are provided basic facilities for lighting/ electricity through various renewable energy sources. Small Hydro Power Generation system, biomass gasification based electricity generation systems, solar photovoltaic power plants etc. in distributed power generation mode may be used depending upon the availability of resources for generation of required electricity. Where none of these options is found to be feasible, individual household based solar photovoltaic home lighting systems are supported on the requests of the State implementing Agencies. The programme is implemented in States by State implementing Agencies. The duration of RVE programme is approved up to March 2012.

1.46 Regarding the financial allocation and expenditure for RVEP during the 11th Five Year Plan (year-wise), the Ministry have furnished the following data:

Year	**Outlay (BE)** *(Rs. in crore)*	**Expenditure** *(Rs. in crore)*
2007-08	143/143	133.04
2008-09	80/88.81	88.81
2009-10	80/82.85	82.85
2010-11	80/80	78.17
2011-12(as on 20.03.2012)	95/79	70.01
Total (as on 20.03.2012)	478/473.66	452.88

1.47 The physical targets vis-à-vis achievements for RVEP during each year of the Plan as furnished by the Ministry is as under:

Year	**Target**	**Achievement** (No. of villages & hamlets sanctioned)
2007-08	2000	1992
2008-09	1500	1694*
2009-10	1500	1431
2010-11	1500	1454
2011-12(as on 20.03.2012)	500	329
Total (as on 20.03.12)	**7000**	**6900**

**This includes 1058 border villages sanctioned under a Special Package for electrification in border villages of Arunachal Pradesh.*

1.48 Cumulative achievement up to 31.3.2012 and target for 2012-13 under RVEP, as furnished by the Ministry of New and Renewable Energy is as under:

Programme Component	Cumulative achievement up to 31.3.2011	Target 2011-12	Achievement in 2011-12	Cumulative deployment up to 31.3.2012	Target 2012-13
Remote village electrification	No. of villages/ hamlets covered: 8,104:	500	1,056	9,160	Not fixed; being covered under NSM.

1.49 The Committee desired to know the reasons of non-achievement of target and also the action plan of the Ministry in the 12th Plan, the Ministry in a note stated as under:

> "The Remote Village Electrification programme of the Ministry was initiated in the wake of the commitment to provide renewable energy based lighting/basic electricity in those villages/hamlets where grid connectivity would not be feasible in near future and are not covered under Rajiv Gandhi Gamin Vidyutikaran Yojana programme. The concerned State Governments had a major role to play in identification of remote villages to be covered under RVE Programme and their expeditious implementation as electrification of unelectrified villages and selection of mode for their electrification are in the domain of the respective States. However, the overall target of 10000 villages and hamlets for the 11th Plan was laid on the basis of approximate projection for the number of villages which would in all likelihood remains uncovered through grid. Tentative indications received by that time from States, for such villages, were utilized for these projections. This was also explained in the 11th Plan document of the Ministry. The targets set for sanction of financial support become at the best notional in light of the initial indications received from the States for the number of villages they may be required to cover. State wise target were not set under the RVE programme of the Ministry and projects were sanctioned case to case basis after proposals are submitted by the implementing Agencies as per the guidelines of the scheme. The Ministry could reach the target only if the States actually demarcated the villages' hamlets, surveyed these villages, prepared proposals for support, mobilized matching state share and took other necessary action for timely implementations. The Ministry on its part made all out effort to persuade the State Governments through continuous review meetings at various levels for identification of villages & hamlets and their timely completion."

D. Research, Design and Development in New and Renewable Energy

1.50 Research & Development activities of the Ministry aim at resource assessment, technology development, demonstration and commercialization. The Ministry supports Research, Design, Development and Demonstration (RDD&D) to development of new and renewable energy technologies, processes, materials, components, sub-systems, products & services, standards and resource assessment so as to indigenously manufacture renewable energy products and systems. A comprehensive policy on RDD&D is in place to support R&D in new and renewable energy sector, including associating and supporting RD&D carried out by industry for market development. It provides guidelines for project identification, formulation, monitoring, appraisal, approval and financial support.

1.51 Regarding the budgetary allocation for the year 2012-13, the Committee have been informed that an amount of Rs.194 crore have been allocated for R&D activities which includes Rs. 64 crore for research Institutions under MNRE such as Solar Energy Centre, Centre for Wind Energy Technology and National Institute of Renewable Energy and Rs.130 crore have been allocated for other R &D activities.

1.52 Component-wise allocation for 2011-12 and proposals vis-à-vis allocation for 2012-13 under RD&D, as furnished by the MNRE, are as under:

Programme Component	**BE 2011-12 (Rs. in crore)**	**BE 2012-13 (Rs. in crore)**	
		Proposed	**Allocated**
Bio-Energy	6	37	20
Solar Energy	40	200	77
Small Hydro Power	1	20	10
New Technology	9	87.5	23
Hydrogen Energy	---	3.0	3.0
Fuel Cell	--	20.0	20.0
Solar Energy Centre	30	30	29
C-WET	5	37	20
NIRE	4	42.5	15
Total	**95**	**454**	**194**

1.53 On being asked about the budgetary allocations both at BE/RE stages vis-à-vis actual expenditure made on R&D during the last three years, the Ministry furnished the following information:

(Rs. in Crore)

2009-10			2010-11			2011-12		
BE	**RE**	**Actual**	**BE**	**RE**	**Actual**	**BE**	**RE**	**Actual**
75	60.96	58.90	148	123	111.46	93	111.53	109.92

1.54 The Committee desired to know whether any targets had been fixed under R&D in renewable sector and also the details of such targets during last three years along with the fund allocation and actual expenditure, the Ministry in a note stated as under:

"No specific targets are fixed for taking up RD&D in renewable energy. However, during last three years a total no. of 110 R&D projects in different areas with budget of Rs.476 crore were sanctioned to different R&D institutions and industry. Major projects were taken in solar energy and hydrogen energy. The numbers of R&D projects taken up with amount sanctioned (MNRE share) in different areas of new and renewable energy during the years 2007-08, 2008-09,2009-10 and 2010-11 is given in the following table:

(Rs. in crore)

Area	**2009-10**		**2010-11**		**2011-12**	
	No. of Projects	Amount sanctioned	No. of Projects	Amount sanctioned	No. of Projects	Amount Sanctioned
Solar Thermal Heat Pump	**5**	**42.42**	3 1	54.525 0.25	4	42.39
SPV	4	9.65	8	74.46	4	56.696
Bio-energy	-	-	1	17.38		
1. Special Project on Cookstove. 2. ABRC Project	1	0.37	4	2.08	1	1.00
Biogas	8	4.48	8	9.74	5	2.51
Bio-fuel	1	4.33	7	7.06	8	6.26
Waste to energy			-	-	-	
Hydrogen	10	31.19	8	74.46	3	1.72
Fuel Cell			4	1.778	2	0.72
Wind (sanctioned C-WET)	3	0.57	5	4.93	-	-
Waste to energy					2	7.30
Total	**32**	**93.01**	**49**	**264.13**	**29**	**118.60**

Total projects sanctioned 110 with budget sanctioned Rs.475.74 crores.

1.55 On being enquired by the Committee about the actual benefit being passed on to the needy as a result of the achievements under R&D Scheme. the Ministry in a note informed as under:

> "As regards benefits, it may be mentioned that R&D is a continuous process, the results of which impact the general development of the sector and are not restricted to some beneficiaries. The benefit of R&D on ongoing processes and products are absorbed by the industry to improve their products quality. The basic R&D on materials and devices takes longer lead time. Regarding reorienting the R&D programme to make it a result oriented one, it is submitted that programme provisions are periodically reviewed by the sectoral R&D Advisory Committees of the Ministry and suitably revised from time to time keeping in view the perceived requirements of the sector/ industry."

1.56 Regarding the major Programmes/Research undertaken along with major achievements made under R&D activities during the year 2011-12, the Ministry have stated in their written replies::

> "Hydrogen Energy:- Three new R&D projects in the area of Hydrogen Energy related to hydrogen production by reformation of bio-mass derived glycerol and photo-catalytic disassociation of hydrogen sulphide into hydrogen and sulphur and emission reduction in a hydrogen fuelled engine were supported during 2011-12. In addition, two new R&D projects for development of catalysts and membrane for polymer electrolyte membrane fuel cell were also supported.
> R&D projects related to photo catalytic splitting of water for hydrogen production, reformation of biomass derived glycerol for hydrogen production (Phase-I), development and characterization of photo catalysts for disassociation of hydrogen sulphide into hydrogen and sulphur (Phase-I) and development of complex hydrides for hydrogen storage concluded during 2011-12. In the area of fuel cells, R&D projects on development of direct alcohol fuel cells and SOFC have been concluded.
>
> Biofuels: A total of nine new R& D projects on production of biofuels from ligno-cellulosic biomass through 2nd Generation technologies with an outlay of about Rs 8.00 crore were sanctioned during the year 2011-12. Projects relate to Development of pre-treatment strategies and bioprocess for improved production of cellulolytic enzymes and ethanol, Butanol production, Bio-crude production, and Hydro-pyrolysis of ligno-cellulosic biomass to value added hydrocarbons, etc. The projects have been sanctioned to institutions including Indian Institute of Petroleum, Dehradun, National Environmental Engineering Research Institute, Nagpur and University of Delhi.
>
> Solar Energy: As a part of R&D activities, a new Centre of Excellence was sanctioned during the year at IIT Rajasthan: Research and education in the area of solar thermal.

The Ministry also initiated a cooperation with CSIR and sanctioned the following two major projects:

- Indian Institute of Chemical Technology, Hyderabad and National Chemical Laboratory, Pune: 'Dye sensitized solar cells'.
- National Physics Laboratory Delhi: Thin film solar cells

In all, 7 projects in solar photovoltaic and 5 projects in solar thermal areas have been sanctioned during the year. Review and monitoring of on-going R&D projects was taken up through specially constituted Expert Committees. A list of thrust areas is already posted on the Ministry's website for the purpose of receiving proposals in the Ministry for consideration of support under R&D Programme. Meetings of the Solar Energy Research Advisory Committee headed by Dr Anil Kakodkar were held and several issues related to research infrastructure in the country and thrust areas were discussed."

1.57 The Committee when enquired about the thrust areas identified for R&D support under new and renewable energy sector for the year 2012-13, the Ministry in their written replies informed as under:

"Solar:
Mission aims at to reach grid parity by 2022 through a combination of measures including research and development and indigenization of manufacturing. The basic thrust is on the development of materials, processes, devices and systems to reduce cost and improve efficiency and durability. Solar power is identified as one of the key areas of research and indigenization. Storage materials and techniques for electrical and thermal energy is also identified as an important area of research.

Hydrogen Energy/ Fuel Cells:
New initiatives proposed to be undertaken during 2012-13 include field evaluation of : hydrogen fuelled vehicles based on IC engine; fuel cell based buses; and fuel cell systems for providing back up power to telecom towers; taking up R&D projects in the area of PEMFC and SOFC; and supporting projects in the area of hydrogen production through renewable resources, hydrogen storage and applications.

Wind power:

To overcome problems of voltage surges and spikes in grid from wind power."

1.58 On being enquired about the highlights of R&D Projects/activities taken up specifically under National Solar Mission, the Ministry in a written reply stated as under:

"R&D activities have helped in creating infrastructure to pursue research on cutting edge solar technologies to achieve objectives of the Mission. The projects were sanctioned after launch of JNNSM, and are still continuing. Some of the major developments include establishment of research test and educational facilities in

the area of solar photovoltaic at IIT Bombay, technology assessment and training facility at Bangalore by Karnataka Power Corporation Ltd., pursuing work on high efficiency solar cells and on advanced materials for solar cells. Indian Association for Cultivation of Science, Kolkata, has licensed production technology for single junction amorphous silicon solar modules developed under MNRE sponsored projects to Hind High Vacuum Company Pvt. Ltd., Bangalore.

In solar thermal area, national test and simulation facility for solar power generation is under advanced stage of commissioning. Simulation software has been developed and launched for designing of solar power projects in the country. Besides, technology development for power generation through central receiver system and solar dish systems is being pursued through industry led R&D projects supported by the Ministry. Earlier, the technology of Fresnel paraboloid dish for industrial process heat systems was developed at IIT Bombay jointly with an industry and the same has been patented for commercial exploitation. Also a two axis tracking system for solar dishes have been developed and patented. "

1.59 On enquiring the extent to which the cost of electricity generation through renewable sources is targeted to be lowered by dint of Research and Development investments/technological advancements, the Ministry in a reply stated as under:

"The cost of power generation from wind energy, biomass and small hydro is already comparable to that from conventional sources and the technologies are already established and matured. Further reduction is not envisaged considering the ever increasing cost of raw materials, equipment and manpower as in case of conventional power projects also. The cost of solar power generation has been decreasing with increased deployment. However, further reduction will be very much dependent on technological advancements in the sector and it is not possible to specify the same at this stage."

1.60 About the progress of creation of Solar Energy Corporation, the Ministry submitted:

"Solar Energy Corporation of India has already been registered as a Section 25 company. Board is headed by Dr. Anil Kakodkar and has met twice during the year. Some staff including Company Secretary have been put in place. Appointment of Managing Director and full time Directors is progressing as per directions of Search-cum-Selection Committee constituted for this purpose. Various posts have been advertised and selection process is in progress. The authorized Share Capital of the Company is Rs. Two Thousand Crore divided into Two Crore Equity Shares of Rupees One Thousand each**.** The objectives of the Solar Energy Corporation of India as listed in the Memorandum of Understanding (MoU) are detailed below:

1. To plan and execute an integrated programme on development and deployment of solar energy technologies to achieve commercialization. To own, operate and manage, or to operate and manage as an agent, any type of power stations,(both grid connected and off-grid

/ distributed) and promote research and development, select suitable sites for solar power stations and ancillary facilities of every kind and description, ensure proper evacuation of power from such stations by providing for associated transmission facilities required for the purpose or otherwise and undertake all measures required therefor or incidental to any or all of the above. To exchange, distribute and sell power in accordance with the policies and objectives laid down by the Central Government under the Jawaharlal Nehru National Solar Mission and as announced from time to time.

2. (a) The main functions of the ("not for profit" section 25) Company would include assisting the Ministry of New and renewable Energy in executing the Mission objectives through appropriate mechanisms (for both grid and off-grid activities), evolving programmes and projects, managing special projects, overseeing and coordinating with all relevant stakeholder agencies in the pursuit of the above objectives

(b) The Company would be responsible for providing thrust to indigenous manufacturing and facilitate related R&D. It would also carry out work related to demonstration and technology validation projects.

(c) The internal administrative functions, IEC, international cooperation projects, HRD training, and financial administration, would also be carried out by the Company.

(d) The Company would also facilitate the work of the R&D Advisory Council and the Industry Advisory Council. The Solar Research Advisory Council would enable the development of a technology roadmap and provide inputs on all matters related to R&D and capacity building to the Mission Steering Group. The Industry Advisory Council would work closely with the Research Council and provide inputs on technology and for creating a framework for promoting applied research in industry. It would provide inputs on matters relating to industrial development, technology transfer/ absorption/ joint ventures, incentives and investment-related matters to the Mission Steering Group, as it goes about its task of policy formulation.

(e) The Company would also undertake setting up of solar projects, both grid connected and off-grid and engage in generating and selling solar power. If necessary, the Company may form joint ventures or SPV for this purpose either with the other Government organizations or in PPP mode. This will allow revenue-earning opportunities in future.

(f). The (proposed Section 25) Company would, in the first phase and under the guidance of the Mission Steering Group be responsible for:

(i) full roll out of the plan to install 1000 MW (plus) of solar grid connected power – including selection of developers, tie-ups with state utilities, interaction with Ministry

of Power and other stakeholders etc.; (NTPC Vidyut Vyapar Nigam (NVVN) will continue to remain the implementing agency for this component of the Mission and shall be responsible to purchase solar power and sell solar power bundled with the thermal power or otherwise. The role of the Company would be to facilitate the activities as and when required and maintain the data base for future reference and expansion of the activity in the Phase II of the Mission.

(ii) full roll out of the component on off-grid solar applications, including deployment of 20 million sq. m solar thermal collector area;

(iii) encourage solar energy start-ups, build a network of incubators, explore innovative financing mechanisms, promote and support Venture Funds in the sector;

(iv) Collaborate with the R&D Advisory Council to develop standards and specifications for the solar industry;

(v) Providing 20 million solar lighting systems in rural areas by 2022.

(vi) under the overall guidance of the MNRE and the Mission Steering Group,

a) play a policy advocacy role with regulators and financial institutions to encourage investment;

b) assist to initiate dialogue and collaborate with possible multilateral and bilateral agencies to upscale solar technology deployment in the country.

c) develop a roadmap for Phase II of the NSM by preparing a framework for using the funds available under the National Clean Energy Fund;

d) undertake awareness generation activities and implement capacity building strategy ; and

e) undertake technical and policy studies and evaluations.

(vii) The Company would manage, disburse and monitor the financial incentives (subsidy/loan/grant) related programmes under the Mission Any other task assigned by the Government from time to time.

(viii) The Company would implement the orders issued by the Ministry for implementation of activities under the Mission including the decisions taken by the Mission Steering Group set up by the Government (Ministry of New and Renewable Energy) with respect to implementation and monitoring of the Jawaharlal Nehru National Solar Mission.

3. To engage in the business of purchasing, selling, importing, exporting, producing (including manufacturing of solar energy related components, fabrication of materials), trading (including trading of electricity), manufacturing or otherwise dealing in all matters relating to the planning

and execution of solar power projects, including hybrid power plants and associated transmission facilities and to the operation and maintenance of such power stations and ancillary facilities and to install, operate and manage all necessary plants, establishments and works.

1.61 When the Committee desired to know about the generation of electricity through stepping on tiles, the Secretary, MNRE stated during evidence:

> "I have not heard about the fact where you step on tiles and that creates probably electrical energy. We will let you know the details on that"

1.62 In regard to bringing new technologies for transport sector, a representative from the Ministry further added:

> "We are working on hydrogen fuel and we are working with some of the automobile manufacturers. We have started that work. In case of CNG vehicles, along with CNG at least 18 to 20 per cent hydrogen can be mixed. We are doing experiments with a number of vehicles in this area only. We have put up a hydrogen dispensing system where CNG and hydrogen are mixed and they are put in the vehicles. If you do that – we are trying that – then the pollution level will come down because hydrogen is a non-polluting thing. Also the conversion efficiency would increase. But it is a question of engineering optimisation and that work is right now going on.
> In another work that is being funded by Department of Science and Industrial Research, we are working with them. They have funded Tata Motors for constructing buses with fuel cells where you put hydrogen as the input energy and you get electricity on the other side. It is an electric vehicle where hydrogen is the fuel. They are developing 10 such fuel cell based buses. We will be experimenting them on different road conditions. So, in this 12th Five Year Plan, also in this year budget, we have kept provision for putting up hydrogen dispensing units in some places so that these experiments can be done.
> The third thing what we are doing with Mahindra & Mahindra is internal combustion engine for three-wheelers. Instead of CNG, we are putting hydrogen and 15 such vehicles are being tried in the Trade Fair Authority, Pragati Maidan. So these are the various experiments which have been done. This is a futuristic thing but certainly a very potential energy related technology".

1.63 Asked about tapping off-shore wind and related R&D work, the Secretary, MNRE informed the Committee that a Steering Committee has been constituted to go into the aspects of creating draft policy as to how off-shore wind is to be treated and that the committee is headed by Secretary MNRE and includes members/representatives from all concerned Ministries and State Governments.

VII. EVALUATION OF RENEWABLE ENERGY RESOURCES

1.64 Evaluation of potential of renewable energy resources is a key factor in development of renewable energy sector in India. While the availability of potential have been explored under various renewable energy programmes from time to time, there is always a need to uphold scientific approach towards such studies by up-gradation of technologies being used and widening the parameters of such evaluations.

1.65 When details were sought from the Ministry regarding methodologies currently in vogue to identify and assess the potential of various forms of renewable energies, the Ministry in a written reply stated:

> "Definite mechanism/ techniques have been developed and upgraded over time to measure the available potential of all the forms of renewable energy sources. In general, Geographic Information Systems (GIS) along with Remote Sensing (RS) is used to map the spatial and temporal distribution of the resources/ demography and land use details. The same is integrated with available and relevant information collected from actual measurements /surveys / processed data from satellite imageries to generate resource distribution maps/ atlas for the country and estimate the potential for energy generation. Some sector specific methodologies are elaborated below:
>
> Wind Energy:
>
> Most reliable method is erecting a tall mast and measuring wind velocity and direction at multiple heights for at least one year. Since such mast measurements cannot be done at every nook and corner of India, models of atmospheric circulation can be formulated for every Country and these are called MESO scale digital models. Such MESO scale models when validated with mast based measurements then the numerical model gives the wind resource at any point in India at a given level. These are broadly the three methodologies for wind potential assessments.
>
> Biomass Energy:
>
> GIS maps with standard data like boundaries, towns, roads and rivers are embedded with available and relevant information collected from survey groups; and processed data from satellite imageries from ISRO, to provide consistent and useful information in a spatial and tabular result at the selected zone of interest. The atlas provides information on biomass residues form agro-crops, as related to energy generation, both in spatial and statistical form. The residue generation based on agricultural output is used to compute the surplus biomass available for energy production after accounting for the societal uses such as fodder, domestic fuel, and thatching. While all the use for fodder and thatching is considered unavailable for energy generation, use for domestic fuel is decided based on the

district level surveys. The data on agricultural outputs are obtained from the published data by Ministry of Agriculture whereas the data on residues are obtained from Taluk and District surveys.

Solar Energy:

Potential of solar energy is assessed based on measurements of solar intensity through ground surface stations which are set up in a country representing various geographical locations. Traditionally, measurement of solar radiation has been a part of measurement of weather parameters, and specifically at airports, besides such measurements at various research laboratories. These measurement stations are required regular upkeep and connection to the power source for getting uninterrupted and reliable data. Use of satellite images has also been in vogue for about a decade for getting first hand information on solar potential and also for interpolation of data between two measuring stations. However, data so obtained may have deviations of the order of 20-30%.

India Meteorological Department (IMD) under Ministry of Earth Sciences is the nodal organization for monitoring of weather parameters. There are 45 stations which are equipped to undertake measurements of some basic solar radiation parameters. These stations are located in various parts of the country and largely in cities. The data from these stations is available from IMD on sale. Solar Energy Centre of the MNRE had a collaboration with IMD and have brought out updated data books recently based on measurements at these stations. These data books have been posted on the MNRE website also."

1.66 The Committee also enquired whether the Atlases showing potential of various renewable energy resources were technologically capable enough to measure the entire potential and accurately and whether they were periodically being updated. The Ministry in written reply stated:

"Wind Energy: The potential indicated by wind atlas at any point defined by Latitude and Longitude in India will be only indicative, so that the locations indicated as windy are the places where new masts can be erected and measurements can be done for actual annual energy prediction.

Biomass: Biomass Resource Atlas provides broad information of total biomass produced, crop wise and residues-wise and likely surplus available for power generation at taluka, district and state levels. However, micro details of present competitive use of biomass have to be assessed before determining power potential accurately. The Atlas is being updated and would include availability of surplus biomass from forest and waste lands. Efforts are being made to map details of competitive uses of different types of biomass while determining the actual biomass power potential.

Solar energy**:** In case of solar, there is no authentic atlas which can give reliable solar radiation data. Based on measurements at IMD over a long period of time, some radiation maps are available which gives information on availability of solar radiation on a macro scale. In the last couple of years, Solar Energy Centre of the

MNRE, jointly with National Renewable Energy Laboratory (NREL), USA, has developed solar atlas for India based on satellite images. These solar atlases are good to give indicative value of solar resource, however, this require validation against the ground surface measurements to be accurate.

In order to upgrade these solar radiation maps into a reliable source of data, the MNRE has taken an initiative to set up 50 solar radiation resource assessment (SRRA) stations at sites having high potential for solar power during Phase I of the programme. CWET is implementing this programme, and all the stations have been commissioned during 2011-12 and data is being collected centrally at CWET, Chennai. Quality check system for data has recently been put in place to ensure good quality of data with the help of German experts under a bilateral Indo-German Programme. This data is available from CWET. These stations are high quality advanced stations.

It is further planned to augment network of SRRA stations by including sites in the States which were not covered during Phase I. It is planned to bring out first draft of solar atlas by the end of the year based on data collected at these stations and IMD stations. IMD is helping MNRE project by providing their knowledge and experience and also through establishment of calibration of laboratories."

1.67 Regarding the evaluation done to estimate, the wind potential in the country and the periodicity of such evaluation, the Ministry informed as under:

"The Indian Wind Atlas has been prepared at 50 meter hub height with the assumption of availability of land in potential sites @ 2 % of the entire area, giving estimated wind power potential of 49,130 MW. Revised potential of approx. 1,00,000 MW (un-validated) at 80 m. height has been estimated by C-WET.

With the change in turbine technology (turbines at the height 100 m) now C-WET is carrying out resource assessment in 7 wind potential states (Andhra Pradesh, Gujarat, Maharashtra, Karnataka, Madhya Pradesh, Rajasthan, Tamil Nadu) at 100 m level based on the realistic assessment of land available for exploitation of wind energy. The masts procurement & installation of sensors and masts is in progress and measurements are scheduled for completion by July 2014, which will enable proper estimation of potential at the end of 12th plan."

1.68 The Ministry informed the Committee that target and achievement regarding harnessing of the Wind Power in 11th Plan were 9,000 MW and 8.589 MW respectively. This achievement was against the potential of 49,000 MW. The Committee were also informed that the deployment target for 12th Plan would be 15,000 MW (physical target) and Rs.100 crore (financial target) and the following strategy would be adopted to achieve the target:

1. Accelerated depreciation to go away
2. Generation Based Incentive (GBI) Scheme to be reviewed after 11th Plan and continued for 12th Plan for upto 4000 MW capacity projects
3. Wind resource activities to be substantially increased
4. Evacuation infrastructure to be augmented

5. Separate RPO for wind and enforcement of RPO to be ensured
6. Make REC work
7. Work towards competitive bidding

1.69 When the Committee pointed out whether the approved outlay of Rs.45 crore for the year 2012-13 (reduced from Rs.100 crore proposed) would not affect the achievement of the physical target for the year; the representative of the MNRE stated during evidence that it would not be affected.

VIII. INFORMATION AND PUBLIC AWARENESS PROGREMME

1.70 Information & Public Awareness (I&PA) in renewable energy is an important component of Ministry activities. Its objective is to generate mass awareness about renewable energy programmes, policies, incentives, systems, products and devices. The Programme is implemented through use of existing Government channels i.e. State Nodal Agencies (SNAs), Directorate of Advertising & Visual Publicity (DAVP), National Film Development Corporation (NFDC), Doordarshan, All India Radio (AIR), etc. Besides, a variety of media like print, electronic and outdoor publicity through exhibitions, bus panels, hoardings, kiosks etc. are used for popularization of new and renewable sources of energy (NRSE) systems and devices.

1.71 The Ministry have been implementing the following support programmes for promotion of renewable energy sources:

(i) Information Publicity and Awareness

Publicity and promotion through electronic, print & outdoor media; setting up of Energy parks; organization of events, support to States/UTs for publicity and promotional activities; Seminars & Symposia.

(ii) International Relations

Covers Multilateral/Plurilateral events, Bilateral economic and technical cooperation, Investment Promotion and Deputation abroad.

(iii) HRD & Training

This includes fellowships fellowships for undertaking M.Sc/M. Tech. course/ doctoral/post doctoral research in relevant new and renewable energy areas that are required by industry and research institutions and State Agencies. Supporting educational institutions for upgrading their Laboratory and Library facilities and developing model course curricula for various target groups.

(iv) Monitoring and Evaluation

Periodic field level monitoring and evaluation of this Ministry's programmes to facilitate correlating outlays with outcomes, carried out mainly through professional organizations, specializing in the same.

1.72 The budgetary allocation under support programmes of the Ministry for the year 2012-13 has been placed at Rs.56.50 crore, out of which Rs.20 crore has been allocated for Information and Publicity. For the year 2011-12, BE and RE under this sub-head was Rs.30 crore while actual utilization during 2010-11 was Rs.27.79 crore.

Part –II

Observations/Recommendations of the Committee

2.1 The Committee note that the detailed Demands for Grants (2012-13) of the Ministry of New and Renewable Energy were laid in Lok Sabha on 16th March, 2012. The Plan Outlay of the Ministry of New and Renewable Energy stands at Rs.3355 crore comprising Gross Budgetary Support of Rs.1385 crore and Internal and Extra Budgetary Resources of Rs.1970 crore. The Committee have examined the Demands for Grants of the Ministry of New and Renewable Energy for the year 2012-13 in details. The Committee endorse the Demands for Grants of the Ministry for the year 2012-13. Recommendations/Observations of the Committee are detailed in succeeding paragraphs.

2.2 The Eighteenth Report of the Standing Committee on Energy on Demands for Grants of the Ministry of New and Renewable Energy for the year 2011-12 was presented to Parliament on 17th August, 2011. The Action Taken Replies of the Government to all the recommendations contained in the Report were received on 16th November, 2011. The Twenty-fourth Report of the Committee on the Action Taken by the Government on the recommendations contained in the Eighteenth Report was presented to Parliament on 29th December, 2011. In the said Report, the Committee had reiterated their two recommendations on 'Wind Energy Programme' and 'Research, Design and Development in New and Renewable Energy' and had also commented on the 'Remote Village Electrification Programme (RVEP) of the Ministry. Final Action Taken Statements on the recommendations contained in the

24th Report were received from the Ministry on 30th March, 2012. The Committee find that the Ministry in their Final Action Taken Statements have replied only to the issues relating to 'Wind Energy Programme' and 'Research, Design and Development in New and Renewable Energy' and not given any reply on the issue relating to 'Remote Village Electrification Programme' (RVEP). The Committee desire that the reply to the recommendation of the Committee contained in their 24th Report pertaining to the 'Remote Village Electrification Programme' may be furnished in the prescribed format immediately. Moreover, the Committee observe that more than six months have passed since the presentation of the Eighteenth Report to the Parliament. The Committee would like to remind the Ministry to observe the provisions of Direction 73A of the 'Directions by the Speaker' and arrange for the Statement by the Minister in the House regarding the status of implementation of the recommendations of the Committee contained in their Eighteenth Report, expeditiously.

(Recommendation Sl. No.1, Para No. 2.2)

ELEVENTH FIVE YEAR PLAN – PERFORMANCE APPRAISAL

2.3 The Committee note that during the 11th Five Year Plan, the actual budget provision made available to the Ministry of New and Renewable Energy (MNRE) was Rs.4068 crore (BE)/ Rs.3897.80 crore (RE) and an amount of Rs.3798.37 crore was actually utilized. While the Government has done fairly well in utilization of the allocated amount particularly for Grid-interactive & off Grid renewable power generation and Renewable Energy for Rural Applications programmes, the fund

utilization was on lower side, especially during the first half of the 11th Plan period, under Renewable Energy for Urban, Industrial and Commercial Applications and Research, Design and Development in Renewable Energy Programmes. The trend of the utilization of the allocated funds indicate that the amount made available under various programmes were not being utilized properly during the first three years of the Plan period in general and the utilization of funds increased considerably during the last two years, thus giving a better picture to the total tally of utilization of funds on completion of the 11th Plan. The Committee also find that the Ministry were not satisfied with the GBS component of the total outlay amounting to Rs.4000 crore for 11th Plan period and had represented to Planning Commission to enhance the Gross Budgetary Support (GBS) component showing apprehension that the approved Gross Budgetary Support (GBS) would be inadequate for achieving the 11th Plan goals/targets. The Ministry were then advised that the issue could be revisited at the time of Annual Plan discussion. Had the Ministry of New and Renewable Energy been able to utilize the allocated amount properly in the first half of the Plan, the Committee feel that probably the Planning Commission would have reconsidered the Gross Budgetary Support (GBS) Component during the mid-term appraisal. However, the Gross Budgetary Support (GBS) component of the Plan outlay remained more or less the same during that period. Though the Ministry can have a sense of satisfaction at the end of the Plan for having been able to manage a respectful utilization, yet there is certainly an element of regret for missing the opportunity of getting enhanced GBS outlay during the concluded Five year Plan.

The Committee expect that the Ministry would ensure a better planning, coordination, management and execution mechanism from the very beginning of the 12th Five Year Plan for obtaining optimum utilization of funds vis-à-vis achievement of physical targets of various programmes.

The Committee note that the physical achievements during the 11th Plan had been 13124.97 MW capacity against the target of 14162 MW under Grid Power and that of 505.11 MWeq against the target of 441.25 MWeq under Off-Grid Power upto February, 2012. The overall achievements have remained almost at par with the targets nearly in all the programmes of Grid Power and Off-Grid barring a few areas like urban Waste to Power in both Grid and Off-Grid Power, Rural Gasifier and SPV Off-Grid programmes, where the physical achievements are not satisfactory. The Committee also find that the Ministry had reduced physical target substantially i.e., from coverage of 10,000 villages to 7000 villages/hamlets under Remote Village Electrification Programme during 11th Plan against which 6900 villages/hamlets could be completed. Nevertheless, the Committee appreciate the efforts made by the Ministry to produce satisfactory outputs in certain areas like Wind Energy, Small Hydro, Bio-Mass and Solar Grid Power in the first phase. At the same time the Committee feel that the Ministry have got a daunting task ahead during the 12th Five Year Plan where a proposed target of 29,800 MW under Grid Power, that is an increase of about 110 percent from 11th Plan target and 3,267 MWeq under Off-Grid Power, that is more than six times higher than the 11th Plan target is to be achieved. The Committee therefore, recommend that the Ministry should come out with proper strategy incorporating concrete plan of action with proper monitoring mechanism

for the 12th Five Year Plan and ensure the achievement of the projected share of 17.55 per cent of the renewable energy vis-a-vis the total power production in the country by the end of 2017 compared to about 12.19 per cent at present.

(Recommendation Sl. No.2, Para No. 2.3)

DEMANDS FOR GRANTS OF MNRE FOR 2012-13

2.4 The Committee note that the Ministry of New and Renewable Energy has got a marginal increase in the Budget Estimate for the year 2012-13 (Gross Budgetary Support of Rs.1385 crore) over the Revised Estimates of previous year (Gross Budgetary Support of Rs.1360 crore). The Committee also note that the Ministry had sought a Gross Budgetary Support to the tune of Rs. 5,582 crore in their annual plan to achieve the targets. The Planning Commission subsequently reduced the amount to Rs.2,979 crore. The Committee are surprised to note that the Ministry of Finance has sanctioned a meagre amount of Rs.1,385 crore only as Gross Budgetary Support for the year 2012-13 which is not even 25 per cent of the proposed demand of the Ministry. Further, the Ministry of New and Renewable Energy have submitted that this amount would be grossly inadequate for upscaling of activities envisaged under various programmes of the Ministry in the year. Scrutiny of the information supplied by the MNRE reveals that the programme of the Ministry like Solar Photovoltic (SPV) Off-Grid programme have suffered a setback due to lack of required funds leading to non-achievement of target during the first phase of the Jawaharlal Nehru National Solar Mission. As such the Ministry are unable to meet a committed Central Financial Assistance (CFA) liability of Rs.1141.88 crore towards the sanctioned 118.12 MWp SPV Off-Grid projects during

2010-11 and 2011-12. The Ministry need to sanction an additional capacity of about 82 MWp during 2012-13 to meet the target of 200 MW in the first phase of the mission. The Committee are unhappy to note that a target of only 30 MWp could be fixed for the year 2012-13 due to the fact that the allocation of funds for year has slipped to only Rs.332 crore. They feel that adequate funding is a must for harnessing the potential of available renewable resources. The Committee are unable to comprehend that the Ministry of New and Renewable Energy, which has upgraded their performance over the years on both financial and physical fronts and have ambitious plans for the next Five Year plan are rather being punished by the Ministry of Finance by not acceding to the recommendations of even the Planning Commission with regard to budgetary allocation to the MNRE for the year 2012-13. Against this backdrop of excellent achievement and in the light of the significance of renewable energy vis-à-vis conventional energy the Committee recommend that the Ministry of New and Renewable Energy should pursue with the Ministry of Finance as well as Planning Commission and be persistent to get allocation of more funds for the Ministry so that the renewable energy programmes, particularly the project of the ambitious Solar Mission may not face a setback in the beginning itself. They urge that Ministry of New and Renewable Energy should reiterate their demand before the Planning Commission and Ministry of Finance while reflecting the importance and significance of their programmes and activities especially with the perspective of energy security, energy access, climate change, reducing dependence on conventional sources of energy and ever increasing demand for energy.

(Recommendation Sl. No.3, Para No. 2.4)

RENEWABLE POWER- GRID AND OFF-GRID PROGRAMMES

2.5 The Committee note that upto 29 February, 2012 the Ministry of New and Renewable Energy had achieved 3409 MW capacity (including States initiatives in Solar Power) against the physical target of 3435 MW during 2011-12 under Grid-interactive power. The allocation during the year was Rs.284 crore at BE stage and Rs. 276.10 crore at RE stage whereas the actual expenditure of Rs.275.10 crore could be made in the year 2011-12. Under Off-grid/Distributed Renewable Power, the achievement was 116.46 MWeq (upto 29th February, 2012) against the physical target of 128.50 MWeq in 2011-12. The allocation at BE stage was Rs.470 crore and at RE stage was Rs.464 crore while the expenditure of Rs.461.98 crore was actually made in the year 2011-12. The Committee find that the Ministry of New and Renewable Energy had proposed for an allocation of Rs.2380 crore to achieve the physical target of Rs.4165 MW (including Rs.1500 crore for transmission infrastructure) under Grid-power in 2012-13 and an allocation of Rs.654 crore was sought to achieve the target of 216 MWeq under Off-grid/DRPS in 2012-13. The Committee are surprised to observe that the Ministry of Finance has not paid heed to the proposal of Rs.1500 crore for development of transmission infrastructure and even for the physical target achievement, actual allocation for 2012-13 has been reduced by more than Rs.400 crore w.r.t. the proposed allocation even though the physical target has remained more or less the same under Grid-interactive power. Allocation is also less under Off-Grid Distributed Power as compared to the demand. The Committee have been given to understand that the target of the Solar SPV applications in Off-grid Distributed Power had to be reduced to the level of 30

MWeq from what could have been about 100 MWeq in 2012-13, due to less allocation of funds. The allocations have been substantially reduced as compared to the demand particularly in Wind Power, Small Hydro Power and Solar Power under Grid-interactive, while these three components constitute about 88 per cent of total Grid-interactive target for the year 2012-13. The Committee are happy to find that the Ministry of New and Renewable Energy has picked up well over the years in their performance in both physical and financial terms. While taking note of the sincere efforts of the Ministry in the development of the renewable energy, particularly Wind, Small Hydro and Solar Energy, the Committee feel that there is no scope for any complacency and a lot more is required to be done in further identification of potential and its realization giving impetus to both Grid and Off-grid programmes. Rather the Committee are concerned about fixing of the physical targets and wish that the Off-grid target should have been enhanced in 2012-13 from the target of 128.5 MWeq for the previous year instead of lowering it slightly to the level of 126 MWeq for the current year. Similarly, the Committee are not convinced with the reduction of allocation from Rs.470/464 crore (BE/RE) in 2011-12 to Rs.450 crore (BE) in 2012-13. The Committee are of the opinion that the renewable energy development programmes should not suffer due to lack of required funds and the strategy for achievements of goals in 12th Plan period should be made in such a way that the financial allocations are adequate to meet the physical targets and produce the desired results. However, the Committee would like to point out that the Ministry had performed reasonably well during the pervious year with almost similar pattern of allocation and hope that they would achieve targets of 2012-13 also with

innovative ways, meticulous planning, flawless execution, improved R&D and appropriate monitoring mechanism.

(Recommendation Sl. No.4, Para No. 2.5)

2.6 The Committee were apprised during the oral evidence that the Ministry of New and Renewable Energy is facing acute evacuation problem particularly at the solar installations in Rajasthan and Laddakh and Wind Energy Installations in Tamil Nadu which otherwise are ideal places for setting up solar photovoltaic panels and wind power installations respectively. The problem may aggravate in future also as more and more solar energy units are coming up under National Solar Mission and Wind Energy Technology is also showing incremental progress in the country. The Committee were also apprised that the MNRE had proposed Rs.1500 crore for transmission infrastructure and Grid-interactive Renewable Power Programme so that the power generated from these projects which cannot be absorbed in the States could be navigated and connected to the National Grid. The Secretary, MNRE also informed the Committee that the Planning Commission did not grant or sanction Rs.1500 crore for transmission infrastructure stating that this is the job of Ministry of Power. In view of this, the Committee recommend that the Ministry of New and Renewable Energy should again take up the matter with the Planning Commission for reconsideration and finalise the authority responsible in consultation with Ministry of Power for the job in a time bound manner in order to give a boost to the upcoming Grid-interactive Renewable Power Programmes so as to utilize the power generated fully. The Committee would await follow-up action taken by the Ministry in this regard.

(Recommendation Sl. No.5, Para No. 2.6)

2.7 The Committee were informed during the oral evidence that the expansion of solar photovoltaic projects in Rajasthan, especially in districts like Jodhpur, Jaisalmer and some other cities will lead to large demand for technically qualified technicians and that they had requested Rajasthan Government to propose setting up ITIs in those areas for providing training to take advantage of the opportunity of employment for the local youth. The Ministry of New and Renewable Energy is ready to provide monetary support for this purpose. The Committee find the proposal of the MNRE a very effective proposition and emphasize that the Ministry should take up the matter with the Government of Rajasthan and other similar placed states expeditiously reflecting the utility and purpose for training the youth which would lead to gainful employment opportunities. The Committee may be kept abreast of the progress in the matter.

(Recommendation Sl. No.6, Para No. 2.7)

NATIONAL SOLAR MISSION

2.8 The Jawaharlal Nehru National Solar Mission which was approved by the Govt. of India in November, 2009 and started in 2010. It aims at development and deployment of solar energy technologies in the country to achieve parity with grid power tariff by 2022. The target of the Mission include deployment of 20,000 MW of grid connected solar power and 2,000 MW of off-grid solar applications by 2022 and that the Mission would be implemented in three phases, where first phase concludes in March, 2013. The Committee note that against the first phase target of 1100 MW capacity addition of grid connected solar power generation, a total capacity of 503.09 MW has been installed as on February, 2012, leaving a capacity of 597 MW to be installed during 2012-13 which is the terminal year of first phase of the Mission. Further, against a target of 200 MWp capacity equivalent off-grid solar photovoltaic system fixed for the first phase, the Ministry have sanctioned SPV projects aggregating to 118.12 MWp during 2010-11 and 2011-12, out of which only 25 MWp equivalent capacity has been installed so far. The Committee have been informed that a target of 30 MWp has been fixed during 2012-13, which if achieved, will lead to the total capacity addition of 1st Phase under off-Grid SPV systems to 55 MWp against a target of 200 MWp. The Committee are disappointed with the progress made so far under Solar Mission. Keeping in view, the **last two years' performance of the Ministry, the Committee are apprehensive about achievement of the physical targets of the first phase of the Mission. The Committee are concerned that non-achievement of the first phase targets will have the cascading effect on the remaining ambitious targets of the Jawaharlal Nehru National Solar Mission. The**

Committee, therefore, strongly recommend that the Ministry should make a serious effort including upscaling of their targets for the year 2012-13 of the Solar Mission to accomplish the first phase target and ensure that the non-achievement of target in the first phase do not spill over to the second phase of the Mission.

(Recommendation Sl. No.7, Para No. 2.8)

2.9 The Committee note that under Off-grid SPV programmes, the budgetary allocation during the year 2010-11 was Rs.227.49 crore (BE) and Rs.254.99 crore (RE), whereas, the actual expenditure was Rs.254.50 crore. In 2011-12, the actual expenditure was Rs.458.64 crore against the BE and RE of Rs.390 crore and Rs.486.5 crore respectively. For the year 2012-13, the allocation is only Rs.332 crore. The Committee find that in the beginning, a target of 200 MWp capacity equivalent off-grid SPV systems was fixed for the first phase i.e. from April 2010 to March, 2013. The Committee were informed that the MNRE had sanctioned 118.12 MWp equivalent against a total target of 100 MWp in 2010-11 and 2011-12 taken together, but the reported achievement were merely of 25 MWp equivalent. Keeping in view the total first phase target of 200 MWp equivalent, a target of atleast 80 MWp should have been fixed for the terminal year of the first phase *viz.* 2012-13. However, the Committee are unhappy to observe that a target of only 30 MWp has been finally fixed during 2012-13 as the allocation of fund is only Rs.332 crore for the year. MNRE has itself admitted that the target for 2012-13 has been reduced due to non-availability of funds during the year. The Committee feel that the drastic reduction of target from proposed 100 MWp to 30 MWp for the year 2012-13 will badly affect the implementation of projects under off-Grid SPV Systems in particular and the

JNNS Mission in general. The Committee, therefore, recommend the Ministry to pursue the matter with the Planning Commission and the Ministry of Finance for more allocation of funds at RE stage.

(Recommendation Sl. No.8, Para No. 2.9)

REMOTE VILLAGE ELECTRIFICATION PROGRAMME

2.10 The Committee note that the Ministry is implementing Remote Village Electrification Programme for providing basic lighting/electrification in those remote unelectrified villages and hamlets where grid extension is not found feasible by the State Governments and hence are not covered under the Rajiv Gandhi Gramin Vidyutikaran Yojana. They have been informed that the duration of RVE Programme is approved up to March 2012. The Committee are unhappy to find that the initial 11th Plan target for electrification of 10,000 villages and hamlets was reduced to 7000, out of which only 6900 villages and hamlets have been sanctioned which includes 1058 border villages sanctioned under a special package for electrification in border villages of Arunachal Pradesh. The Committee find that so far only 3186 remote villages and hamlets have been provided renewable energy based system and projects and another 400 remote villages and hamlets are under implementation in various North-Eastern States under the scheme. They also fail to understand that even when the reduced targets of 11th Plan could not be achieved, the Ministry's 12th Five Year Plan programmes do not include the RVE Programme at all. In Committee's view, the RVE Programme of the Ministry was a good initiative for providing basic lighting/electrification in the unelectrified remote villages and hamlets where grid connection is not found feasible. Therefore, discontinuing the

RVE Programme is depriving people of their basic rights in the remote countryside particularly border areas. The Committee, therefore, recommend that the Ministry should critically review their performance and accomplish the remaining unelectrified villages and hamlets which were sanctioned in 11th Plan in a time bound manner now. The Committee also feel the need for re-assessment/evaluation of the RVE programme and continue the programme in the 12th Five Year Plan in a more effective manner so that the plans are converted into reality and the population living in remote and far flung areas get the basic lighting/electrification thereby improving their living conditions.

(Recommendation Sl. No.9 Para No. 2.10)

2.11 In their 18th Report, the Committee had recommended that the Ministry of New and Renewable Energy in consultation with the Ministry of Power may set up a co-ordination Committee consisting of representatives from various implementing agencies at the required level to facilitate and monitor implementation of two programmes under Rajiv Gandhi Grameen Vidyutikaran Yojana and Remote Village Electrification Programme specifically in identification of villages and hamlets which will be covered under the respective programmes. The Ministry in their Action Taken Replies have inter-alia submitted that a co-ordination Committee has already been constituted under the Chairmanship of the Secretary, Ministry of New and Renewable Energy. The Committee consists of representatives from the Ministry of Power, Ministry of Panchayati Raj, Rural Electrification Corporation, Planning Commission and representatives from the State Implementing Agencies. The committee monitors the implementation of RVE Programme in addition to

sanctioning of new projects. The Committee are satisfied that a Co-ordination Committee has been constituted in accordance with their recommendation. They would, however, like to be apprised of effectiveness of this Committee in coordinating and implementing the desired objectives of identification of villages for RVE Programmes, coverage of villages so far and time bound programmes for electrification of the remaining villages etc. The Committe would also expect the coordination committee to coordinate and ensure the maintenance and monitoring of the systems installed in electrified villages.

(Recommendation Sl. No.10, Para No. 2.11)

RESEARCH, DESIGN AND DEVELOPMENT IN NEW AND RENEWABLE ENERGY

2.12 The Committee note that there is policy for promoting research, design and development activities in new and renewable energy sectors. It has provision to support R&D for technology development and demonstration through various academic and research institutions including autonomous bodies and centres. The thrust area of research and development activities should include resource identification, resource assessment, technological development, demonstration, popularization, cost competitiveness and commercialization of new and renewable energy sources. They can become an effective alternative of conventional sources of energy provided due attention is given to R&D in this sector.

For the year 2012-13, an amount of Rs.194 crore has been earmarked for R&D activities. Of this Rs.64 crore will be for research Institutions under MNRE such as Solar Energy Centre and wind energy technology, wind national institutes of

renewable energy. The remaining Rs.130 crore be utilized for R&D efforts in solar energy, bio-energy, hydrogen energy, fuel cells and small hydro areas.

No doubt, as compared to last three years, R&D allocation for the year 2012-13 has shown an increase but it is not adequate enough as required by this sector. The total budgetary allocation of the Ministry is less than 0.50 per cent of the total budget of the Government. From the allocation of Rs.3355 crore, only Rs.194 crore has been allocated for R&D sector. It is high time that the Govt. ensures that R&D activities do not suffer for want of funds. Regarding major achievement under R&D activities during 2011-12, the Committee have been informed that hydrogen energy, bio-fuels and solar energy were the main areas in which R&D activities were focused and that for the year 2012-13, the focus of the R&D support will be on solar energy, hydrogen energy/fuel cells and wind power which will also coverd Bio energy and small hydro power. The Committee are happy to note that of late various Centres of Excellence like different IITs, AHEC Roorkee, CSIR, the Indian Institute of Chemical Technology Delhi, National Petroleum Research Institute Dehradun, National Physics Laboratory, etc. have been roped in with regard to various research programmes of the renewable energy sector.

The Committee feel that the R&D is the most crucial and prime factor for development of all the renewable sources of energy especially keeping in mind the shift of country's focus from fossil fuel (coal/gas/oil) to these renewable sources of energy like solar, wind, hydrogen, biogas etc. Further, the endeavour of the Ministry

itself to increase its share in the total energy sector from present 12.19 percent to 17.55 percent in 2017 would call for enhanced allocation to this R&D sector.

The Committee urge the Ministry also to focus on technological advancements in other countries and adopt new technologies. They emphasize that the efforts being made or the experiments being undertaken by the Ministry in regard to Hydrogen Energy along with CNG, fuel cells, electric and hybrid electric vehicles should be pursued vigorously and with a result and commercial oriented approach. The Committee recommend that the Ministry of New and Renewable Energy should persuade the Ministry of Finance for additional funds for R&D projects at Revised Estimate stage.

(Recommendation Sl. No.11, Para No. 2.12)

2.13 The Committee note that with a view to institutionalize the various efforts for giving fillip to renewable energy sector, Solar Energy Corporation of India and the Sardar Swarn Singh National Institute of Renewable Energy are proposed to be established under the Ministry of New and Renewable Energy. The Solar Energy Corporation of India will function as a Section 25 Company whereas Sardar Swarn Singh National Institute of Renewable Energy will be an autonomous institution. The Solar Energy Corporation will cover the entire gamut of activities under National Solar Mission for development solar sector in the country. The objective of the corporation will inter-alia include plan and execute an integrated programme on development and deployment of solar energy technologies to achieve commercialization. To own, operate and manage any type of power stations (both

Grid and Off-Grid) to promote research and development, site selection for power stations, power evacuation and to exchange, distribute and sell power as per the policies of the Govt. of India. This will also assist MNRE in executing Mission's objective through appropriate mechanism besides coordinating with all stake holders. It will facilitate work of R&D Advisory Council and Industry Advisory Council. It would also provide inputs, although ancillary in nature, but essential in the overall development of the sector like the industrial development technology transfer, joint ventures, incentives and investment related matters. Since, this Corporation is going to be an umbrella organization looking after every possible and foreseeable activities for development of solar energy under National Solar Mission, the Committee would watch with keen interest the progress of its operationalisation.

Similarly, the Committee observe that the Sardar Swarn Singh National Institute of Renewable Energy has been established with a view to focus on research in bio-energy. With the development of state-of-the art laboratory and R&D projects, the laboratory is set to operationalise by June, 2012 and development of R&D projects will receive the big boost. This body is being established as an autonomous body. Simultaneously, it is also proposed to set up a National Bio Fuel Development Board and strengthen the existing institutional mechanisms. In the opinion of the Committee, the existing institutional mechanism as ordained under Allocation of Business may result in the duplication of the efforts and overlapping of responsibility with Sardar Swarn Singh National Institute of Renewable Energy. The work on the Sardar Swarn Singh National Institute of Renewable Energy is

nearing completion whereas on Solar Corporation of India, it is at the preliminary stage and both when operationalise, will be acting as catalyst for rapid growth of renewable energy resources of the country.

The Committee, while welcoming the initiatives of the Govt. to institutionalize their efforts, recommend that the constitution of larger projects should be done in such a manner that they do not result in duplication of efforts, progress of work be ensured in a time bound manner and the role assigned to them is performed with sincerity and professionalism with par excellence. There should also be special mechanism to periodically review the functions of these bodies with regard to the target set by them and their timely achievement so that corrective measures can follow on the non-performance of these bodies.

(Recommendation Sl. No.12, Para No. 2.13)

EVALUATION OF RENEWABLE ENERGY SOURCES

2.14 The Committee note that the process of preparing resource estimation identification and assessment of potential of various forms of renewable energy are at an incipient stage, bereft of accurate scientific process and largely depending on manual, unscientific or semi-scientific processes. As regards, the estimation of solar energy potential, semi-scientific tenor appears to have been introduced with the contribution from Indian Meteorological Department, use of satellite images and establishment of 50 solar radiation resource assessment stations at the sites having high potential for solar power. But these efforts only provide indicative value of

solar resources. It has been planned to bring out first draft of solar satellite by the end of the year based on data collected from solar radiation resource assessment stations and IMD stations.

The methodology for assessment of wind energy is also conventional as it is defined by Latitude and Longitude so that the locations indicated as windy are the places where new masts can be erected and measurement can be done. The scope of assessing the potential of bio mass energy are further complicated and less scientific as the information is collected through (GIS) maps from survey groups and processed data from satellite images of ISRO. Similarly are the processes for other sources of renewable energy like, small hydel, tidal and geo- thermal etc also needs review and updation.

The current task of assessment of various energy resources is a daunting one. The Committee feel that despite the complexities involved and arduousness of the exercise efforts should be made to overcome the problem so as to achieve the objective. The weather/geographical conditions prevailing in various parts of the country with regional or special characteristic should be taken into account. The Committee feel that potential assessment should be linked with it. By now it must be abundantly clear to the Ministry as to which geographic areas are highly concentrated pockets for potential of various sources of renewable energy in the decreasing order. Accordingly, segmentation can be done with regard to potential of the resources so as to focus their efforts on harnessing the same. Consequent to such segmentation and identification, it should be ensured that efforts are undertaken in high density zones for harnessing whereas potential identification

efforts can be focused elsewhere. This will economise expenditure, minimize efforts while maximize the yield. Based on this characteristic, specific research should be done about the nature, behavior, potential and the availability of such natural bounties in lesser pockets. The Committee, therefore, strongly recommend that efforts in this regard should be reinvigorated. If needed, the views/services of the related organizations/individuals can also be considered as an additive in accurately assessing the potential.

(Recommendation Sl. No.13, Para No. 2.14)

INFORMATION AND PUBLIC AWARENESS

2.15 It is undeniable fact that renewable energy sector is now seen as a significant player in the grid connected power generation and an essential player for energy access. However, the Committee feel that it is also important to generate mass awareness about renewable energy programmes, policies, incentives, systems, products and devices. The Committee is also aware the MNRE implements their information and public awareness programme through Government channels i.e State Nodal Agencies (SNAs), Directorate of Advertising and Visual Publicity (DAVP), National Film Development Corporation (NFDC), Doordarshan, AIR, etc. It also publicise new and renewable sources of energy systems and devices through exhibitions, bus panels, hoardings, kiosks etc and a variety of print, electronic and outdoor publicity.

The Committee, however, find that an allocation of Rs.30 crore (BE) was made for Information and Publicity in 2011-12 while the same has been reduced to

Rs.20 crore for the year 2012-13. The Committee urge the Ministry to pursue the matter with Planning Commission and ensure that the allocation be adequately increased for this purpose.

(Recommendation Sl. No.14, Para No. 2.15)

NEW DELHI

2nd May, 2012
Vaisakha 12, 1934 (Saka)

MULAYAM SINGH YADAV,
Chairman,
Standing Committee on Energy

Annexure-I

(vide para No. 1.11 of the Report)

consolidated year wise details of Financial Allocations and Expenditure during the 11th Plan

(Rs. in crore)

S.No	Programme Component	2007-08		2008-09		2009-10		2010-11		2011-12		Total	
		Outlay (BE)	**Exp.**	**Outlay (BE)**	**Exp.**	**Outlay (BE)**	**Exp.**	**Outlay (BE)**	**Exp.**	**Outlay (BE)**	**Exp.**	**Outlay (BE)**	**Exp.**
1.	Grid-Interactive & Distributed Renewable Power	110.00	87.92	150.00	116.20	220.00	200.88	545.00	533.01	754.00	901.81	1779.00	1839.82
2.	Renewable Energy for Rural Applications	200.00	190.29	160.00	151.19	155.00	152.42	170.00	199.17	225.00	217.88	910.00	910.95
3.	Renewable Energy for Urban, Industrial and Commercial Applications	80.00	22.22	26.00	16.55	75.00	64.72	25.00	36.88	10.00	6.91	216.00	147.28
4.	Research, Design & Development in Renewable Energy	60.00	31.74	100.00	27.80	78.00	59.47	148.00	111.40	95.00	109.92	481.00	340.33
5.	Supporting Programmes	178.00	146.55	184.00	130.04	92.00	71.34	112.00	99.74	116.00	112.31	682.00	559.98
TOTAL GROSS BUDGETARY SUPPORT (GBS)		**628.00**	**478.72**	**620.00**	**441.78**	**620.00**	**548.83**	**1000.00**	**980.20**	**1200.00**	**1348.83***	**4068.00**	**3798.36**

** Includes funds released under clean energy projects equal to Rs.160.80 crore.*

Annexure-II

(vide para No.1.11 of the Report)

DETAILED PROGRAMME/SYSTEM-WISE FINANCIAL ALLOCATIONS AND EXPENDITURE DURING 11TH PLAN

S. NO	Programme /system	2007- 08		2008 - 09		2009 - 10		2010 - 11		2011 - 12		TOTAL	
		BE/RE	EXPD.	BE/RE	EXPD.	BE/RE	EXPD.	BE/RE	EXPD.	BE/RE	EXPD.	BE/RE	EXPD.
GRID POWER													
1.	Wind Power	18/ 11.5	11.17	17.50/ 14.00	8.41	15.40/ 10.90	10.90	48/ 34.9	34.9	32.5/ 22.5	22.5	131.4/ 93.8	87.88
2.	Small Hydro	41/ 41	40.90	48/ 73	72.99	94.5/ 94.5	94.49	135/ 135	134.99	135/ 150.6	150.58	453.50/ 494.10	493.95
3.	Bio Power/ Bagasse Cogeneration	30.00/ 19.00	13.72	28.00/ 18.00	10.12	29.90/ 29.90	29.90	30.00/ 33.80	33.80	52.78/ 52.78	52.78	170.68/ 153.48	140.32
4.	Waste to Power(WTP)	-	-	-	-	11.90/ 8.75	3.49	12/ 11.42	11.42	14/ 6.62	6.61	37.9/ 26.79	21.52
5.	Solar Power	-	-	-	-	30/ 30	-	30/ 30	29.94	55/ 41.4	41.4	115/ 101.40	71.34
OFF-Grid													
6.	Waste to Power	9.0/ 9.0	6.74	12/ 10.75	9.12	17.80/ 7.0	5.78	20/ 12.45	12.42	11.0/ 9.07	9.06	69.8/ 48.27	43.12
7.	Non-bag Cogen	9.0/ 9.52	9.52	7.25/ 7.40	6.59	7.0/ 10.03	10.03	7/ 11.64	11.64	12/ 14.33	14.33	42.25/ 52.92	52.40
8.	Gasifiers	5.25/ 4.00	3.16	4.50/ 3.50	2.32	5.50/ 4.00	3.95	6.00/ 400	3.49	6.00/ 5.00	4.66	27.25/ 20.50	17.58
9.	Aero-Gens/Hybrid systems	2.5/ 4.9	4.9	4.65/ 5.95	5.95	5.0/ 3.9	3.83	5.0/ 3.9	1.53	5.0/ 5.0	5.0	22.15/ 23.65	21.21
10.	Off-grid SPV systems	29.50/ 60.75	55.47	62.75/ 67.35	62.45	92.70/ 84.50	80.85	227.49/ 254.99	254.50	390.0/ 485.8	485.8	802.44/ 953.39	939.07
11.	Water Mills (WMs)/ Micro/ mini-hydel plants	4.0/ 4.0	3.94	5.5/ 5.5	5.41	4.0/ 4.0	4.0	10/ 10	9.99	4.0/ 4.0	3.99	27.50/ 27.50	27.33

RENEWABLE ENERGY FOR RURAL APPLICATIONS													
12.	Remote Village Electrification Programme	143/ 143	133.04	80/ 88.81	88.81	80/ 82.85	82.85	80/ 80	78.17	95/ 79	77.88	478/ 473.66	460.75
13.	Family type biogas plants	36.00/ 56.00	55.91	61.00/ 57.00	57.00	63.75/ 68.15	68.15	90.00/ 120.00	120.00	130.00/ 140.00	140.00	380.75/ 441.15	441.06
14.	Solar water heating	57.90/ 57.90	18.0	24.50/ 24.50	13.96	10.00/ 10.00	10.00	15.00/ 30.00	30.00	40.00/ 106.50	106.50	228.90/ 147.40	178.46
15.	Energy-efficient buildings and solar cities	-	-	-	-	64.80/ 55.10	54.73	10.00/ 7.00	6.88	9.95/ 6.95	6.95	84.75/ 69.05	68.56

Annexure-III

(vide para No.1.11 of the Report)

11th PLAN –PHYSICAL TARGETS AND ACHIEVEMENT (till 29.02.2012)

S. No.	Programme / system		2007-08		2008-09		2009-10		2010-11		2011-12		Total 11th Plan	
			Target	Ach.	Target	Ach.	Target.	Ach..	Target	Ach.	Target	Ach. (as on 29.02.2012)	Target	Ach.
GRID POWER (Capacities in MW)														
1.	Wind Power		1500.00	1663.00	2000.00	1485.00	2500.00	1565.00	2000.00	2350.00	2400.00	2165.00	10400	9228.00
2.	Small Hydro		200.00	204.75	250.00	248.93	300.00	305.27	300.00	307.22	350.00	299.51	1400.00	1365.68
3.	Bio Power			81.00		97.00		151.00	455.00	144.00		145.00	1855.00	618.00
4.	Bagasse Cogeneration		250.00	185.00	300.00	248.00	400.00	297.00		322.00	450.00	312.00		1308.40
5.	Waste to Power	Urban	2.00	-	5.00		14	4.72	17.00	-	25.00	17.20	63.00	21.92
		Indstl.	10.00	11.72	8.00	5.06	10.00		-	7.50		-	28.00	24.28
6.	Solar Power				14.00		2.00	8.15	200.00	26.59	200.00	468.35	416.00	503.09
	Total		**1962.00**	**2145.47**	**2577.00**	**2083.99**	**3226.00**	**2331.14**	**2972.00**	**3157.31**	**3425.00**	**3407.06**	**14162.00**	**13124.97**
OFF – GRID (Capacities in MWeq)														
7	Waste to Power	Urban	3.00	3.00	5.00			-		-	-	-	8.0	3.0
		Indstl	5.00	4.00	7.00	7.36	10.00	15.88	13	23.70	15.00	28.03	50.0	78.97
8.	Non-bag Cogen		20.00	49.20	30.00	75.77	50.00	50.00	75	80.73	80.00	61.79	255.00	317.49
9.	Gasifiers	Rural	1.00	1.02	1.00	1.03	3.00	1.08	4.00	1.37	3.00	1.77	12.00	6.27

S. No.	Programme / system		Target	Ach.	Target	Ach.	Target.	Ach..	Target	Ach.	Target	A ch.	Target	Ach.
		Indstl	10.00	11.62	10.00	13.20	10.00	11.08	15.00	9.00	10.00	11.39	55.00	56.29
10.	Aero-Gens/ Hybrid systems		0.15	0.11	0.30	0.11	0.30	0.22	0.50	0.18	0.50	0.52	1.75	1.14
11.	SPV Systems		-	3.56	-	2.59	5.00	9.18	32.00	10.63	20.00	11.00	57.00	36.96
12.	Water Mills (WMs) / Micro/mini-hydel plants		-	0.37	-	0.70	-	1.72	2.50	2.20	400.00 nos.	350.00 nos.	2.50/ 400.00	4.99/ 350.00
	Total		**39.15**	**72.88**	**53.30**	**100.76**	**78.30**	**89.16**	**142.00**	**127.81**	**128.50**	**114.50**	**441.25**	**505.11**
DECENTRALISED RENEWABLE ENERGY SYSTEMS AND OTHER PROGRAMMES														
13.	Remote Villa Electrification (Nos. of Village Hamlets)		2000	1279 completed	1500	326 completed	1500	1536 completed	1500	1740 completed	500	906 completed	7000	5787 completed
14.	Family type Biogas Plants (No. in Lakh)		1.04	0.89	1.24	1.08	1.50	1.20	1.50	1.51	1.52	1.01	6.80	5.69
15.	Solar Water Heating – collector area (Million sq. meter)		0.60	0.45	0.60	0.56	0.60	0.62	1.00	1.00	0.60	0.52	3.40	3.15

MW = Megawatt; kW = kilowatt, kWp = kilowatt peak; sq.m. = square meter,

Annexure-IV

(Vide Para No. 1.17 & 1.23 of the Report)

PROPOSED SCHEME WISE PHYSICAL TARGETS AND FINANCIAL OUTLAY FOR 12TH PLAN AND FOR THE FINANCIAL YEAR 2012-13

S.No	Programme	12th Plan		Annual Plan 2012-13		AP-12-13 as discussed in Planning Com.	Approved Out lay for 2012-13	Revised target 2012-13
		Physical	Financial	Physical	Financial	Financial	Financial	Physical
			Rs. in crore		Rs. in crore	Rs. in crore		MW
I- GRID-INTRACTIVE AND DISTRIBUTED RENEWABLE POWER								
(A)	**Grid-interactive (MW)**							
1	Wind Power	15,000	1,600	2,500	100	100	45	2500
2	Small Hydro Power	2,100	1,500	350	340	260	150	350
3	Solar power*	10,000	7,142	800	310	310	80	800
4	Biomass Power (Combustion)	500	260	100	10	10	10	100
	Biomass Power (Gasification)	100	135	15	5	5	5	5
	Bagasse Cogeneration	1,400	210	350	70	70	65	350
5	Urban & Industrial Waste to Energy	700	1,245	50	45	45	20	20
6	Transmission Infrastructure		7,000		1,500	10	0	0
	Sub-total (A)	**29,800**	**19,092**	**4,165**	**2,380**	**810**	**375**	**4125**
(B)	**Off-Grid/DRPS (MW)**							
1	Solar applications*	1,000	7,000	100	560	560	405	30
2	Energy from Urban/ Municipal/ Industrial Wastes						6	20
3	Non Bagasse Cogeneration in Industry	2,000	1,050	80	15	15	7	60
4	Biomass Gasifiers- Rural electrification (No. of Villages) 1000 villages	32	90	3	9	9	4	1.5
5	Biomass gasifiers for Industry	150	50	20	5	5	3	10
6	Bio-gas based energy	50	250	6	30	30	9	2
7	Micro hydel & Watermills 25 MW; 2000	25	100	5	20	20	14	2
8	Aero-generators /Hybrid systems	10	100	2	15	15	2	0.5
	Sub-Total (B)	**3,267**	**8,640**	**216**	**654**	**654**	**450**	**126**
	I- Total (A) + (B)	**33,067**	**27,732**	**4,381**	**3,034**	**1,464**	**825**	
II - RENEWABLE ENERGY FOR RURAL APPLICATIONS								
1	RVE Programme							
2	Family type biogas plants (lakh Plants)	7	980	1.5	210.00	165	154	1.25
3	Other Biogas applications		85		8.00	4	2	
4	Cook Stove(lakh)	35	390	5.75	50.00	30	14	1.5
5	Solar Cookers (lakh)*	3.5	90	0.7	18.00	18	5	
6	Solar Cookers for schools Large size(lakh)*	5	900	0.5	50.00	50	0	
7	Energy Plantations		750		5.00	1	0	
	II- Total		**3195**		**341.00**	**268.00**	**175**	
III- RENWEABLE ENERGY FOR URBAN, INDUSTRIAL& COMMERCIAL APPLICATIONS								
1	Solar Thermal Systems							
	Flat Plate Systems(lakh sq.m)*	60.5	839.00	1	194	194	0	0.6

	CST based systems(lakh sq.m)*	2	110.00	0.15	10	10	0	
2	Green buildings*		10.00		2	2	2	
3	Solar Cities/pilot/ related activities*		260.00		48	48	10	
4	Alternate fuel vehicles(Lakh)	2.75	505.00	0.55	100	10	10	
	III - Total		**1724**		**354**	**264**	**22**	
IV- RESEARCH, DESIGN &DEVELOPMENT IN RENEWABLE ENERGY								NA
1	Bio-Energy							
	- Bio-fuel		320		10	10	7	
	- Biogas		100		20	10	8	
	- Biomass Gasification		5		5	3	3	
	- Waste-to-Energy		5		1	1	1	
	- Cookstoves		10		1	1	1	
2	Solar Energy*		625		200	200	77	
3	Wind Energy							
4	Small Hydro Power		100		20	10	10	
5	New Technology:							
	Hydrogen Energy &HEFC		160		27.5	12	15	
	Fuel Cells		235		19	5	5	
	Tidal Energy		170		25	2	1	
	Geo Thermal		100		7	2	1	
	Battery Operated Vehicles		45		9	1.5	1	
6	Solar Energy Centre (SEC)*		100		30	30	29	
7	C-WET		225		37	20	20	
8	NIRE		100		42.5	42.5	15	
	IV - Total		**2300**		**454**	**350**	**194**	
V - SUPPORT PROGRAMMES								NA
1	Information and Publicity programmes (incl. SADP)		500		85	20	20	
2	International Relations		30		6	4	4	
2	HRD & Training		220		50	17	8	
3	Monitoring & Evaluation		75		15	3	1	
4	Plan Secretariat (Administration)		150		20	18	17	
6	IREDA Equity		2,500		500	210	60	
9	Outstanding liabilities of 11th plan RVE,VESP and other programmes		200		50	15	20	
10	e - governance				5	2	1	
11	Support to SNA		150		30	10	2	
12	Solar Energy Corporation*		2000		600	300	16	
13	National Renewable Energy Corporation		100		5	1	0	
	V- Total		5925		1366	600	149	
	Grand Total		40,876		5,549	2,946	1,365	
	Externally Aided Projects(EAP)		103		33	33	20	
			40,979		5,582	2,979	1385	
	IEBR				1,971	1,970	1970	
	Grand Total (GBS + IEBR)				7,553	4,949	3355	
	* Activity under Solar Mission Total Budget					1722	624	

Annexure V

Vide Para No.1.21 of the Report)

DEMAND NO.68

Ministry of New and Renewable Energy

A. The Budget allocations, net of recoveries and receipts, are given below:

(In crores of Rupees)

Sr. No.	Group/Sub Group/Sub Sub Group/Scheme/Sub Scheme/Programme/Sub Programme	Major Head	Actual 2010-2011			Budget 2011-2012			Revised 2011-2012			Budget 2012-2013		
			Plan	**Non-Plan**	**Total**	**Plan**	**Non-Plan**	**Total**	**Plan**	**Non-Plan**	**Total**	**Plan**	**Non-Plan**	**Total**
		Revenue	920.25	12.75	933.00	1132.50	14.38	1146.88	1127.50	14.38	1141.88	1291.00	14.79	1305.79
		Capital	*53.27*	*0.00*	*53.27*	*65.50*	*0.00*	*65.50*	*70.50*	*0.00*	*70.50*	*92.00*	*0.00*	*92.00*
		Total	**973.52**	**12.75**	**986.27**	**1198.00**	**14.38**	**1212.38**	**1198.00**	**14.38**	**1212.38**	**1383.00**	**14.79**	**1397.79**
1.	Secretariat-Economic Services	3451	9.89	11.88	21.77	15.00	13.38	28.38	14.25	13.38	27.63	17.00	14.29	31.29
New and Renewable Energy														
2.	*Grid Interactive and Distributed Renewable Power*													
2.01	Grid Interactive and Distributed Renewable Power	2810	532.60	0.00	532.60	664.00	0.00	664.00	800.80	0.00	800.80	750.88	0.00	750.88
2.02	Less - Amount met from National Clean Energy Fund	2810	0.00	0.00	0.00	0.00	0.00	0.00	-160.80	0.00	-160.80	-35.88	0.00	-35.88
	Net		*532.60*	*0.00*	*532.60*	*664.00*	*0.00*	*664.00*	*640.00*	*0.00*	*640.00*	*715.00*	*0.00*	*715.00*

3.	Renewable Energy for Rural Applications	2810	168.17	0.00	168.17	176.00	0.00	176.00	180.00	0.00	180.00	124.50	0.00	124.50
		3601	31.00	0.00	31.00	19.00	0.00	19.00	20.00	0.00	20.00	22.00	0.00	22.00
		Total	*199.17*	*0.00*	*199.17*	*195.00*	*0.00*	*195.00*	*200.00*	*0.00*	*200.00*	*146.50*	*0.00*	*146.50*
4.	Renewable Energy for Urban, Industrial and Commercial Applications	2810	36.88	0.00	36.88	10.00	0.00	10.00	7.00	0.00	7.00	22.00	0.00	22.00
5.	*Research, Design & Development in Renewable Energy*													
5.01	Research, Design & Development in Renewable Energy													
5.01.01	Research, Design & Development in Renewable Energy	2810	108.17	0.00	108.17	77.50	0.00	77.50	99.75	0.00	99.75	180.55	0.00	180.55
5.01.02	Less - Amount met from National Clean Energy Fund	2810	0.00	0.00	0.00	0.00	0.00	0.00	-2.00	0.00	-2.00	-4.55	0.00	-4.55
	Net		108.17	0.00	108.17	77.50	0.00	77.50	97.75	0.00	97.75	176.00	0.00	176.00
5.02	Research, Design & Development in Renewable Energy	4810	3.27	0.00	3.27	15.50	0.00	15.50	15.50	0.00	15.50	16.00	0.00	16.00
	Total-Research, Design & Development in Renewable Energy		*111.44*	*0.00*	*111.44*	*93.00*	*0.00*	*93.00*	*113.25*	*0.00*	*113.25*	*192.00*	*0.00*	*192.00*
6.	*Supporting Programmes*													
6.01	External Support(EAP)	2810	0.45	0.00	0.45	6.00	0.00	6.00	6.00	0.00	6.00	20.00	0.00	20.00
6.02	Domestic Support	2810	41.46	0.87	42.33	44.50	1.00	45.50	42.50	1.00	43.50	36.00	0.50	36.50
	Total-Supporting Programmes		*41.91*	*0.87*	*42.78*	*50.50*	*1.00*	*51.50*	*48.50*	*1.00*	*49.50*	*56.00*	*0.50*	*56.50*

7.	Other Expenditure	2810	0.00	0.00	0.00	0.10	0.00	0.10	0.00	0.00	0.00	20.00	0.00	20.00
		3601	0.16	0.00	0.16	0.40	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00
		Total	*0.16*	*0.00*	*0.16*	*0.50*	*0.00*	*0.50*	*0.00*	*0.00*	*0.00*	*20.00*	*0.00*	*20.00*
8.	Investment in Public Enterprises	4810	50.00	0.00	50.00	50.00	0.00	50.00	55.00	0.00	55.00	76.00	0.00	76.00
	Total-New and Renewable Energy		**972.16**	**0.87**	**973.03**	**1063.00**	**1.00**	**1064.00**	**1063.75**	**1.00**	**1064.75**	**1227.50**	**0.50**	**1228.00**
9.	Lumpsum Provision for N.E.Region & Sikkim	2552	0.00	0.00	0.00	120.00	0.00	120.00	120.00	0.00	120.00	138.50	0.00	138.50
10.	Actual Recoveries	2810	-8.53	0.00	-8.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grand Total		***973.52***	***12.75***	***986.27***	***1198.00***	***14.38***	***1212.38***	***1198.00***	***14.38***	***1212.38***	***1383.00***	***14.79***	***1397.79***
B. Investment in Public Enterprises		**Head of Development**	**Budget Support**	**IEBR**	**Total**	**Budget Support**	**IEBR**	**Total**	**Budget Support**	**IEBR**	**Total**	**Budget Support**	**IEBR**	Total
8.01	Indian Renewable Energy Development Agency	12810	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8.02	Solar Energy Corporation of India	12810	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total-		***0.00***	***0.00***	***0.00***	***0.00***	***0.00***	***0.00***	***0.00***	***0.00***	***0.00***	***0.00***	***0.00***	***0.00***
C.Plan Outlay*														
1	New and Renewable Energy	12810	973.52	0.00	973.52	1078.00	0.00	1078.00	1078.00	0.00	1078.00	1244.50	0.00	1244.50
2	North Eastern Areas	22552	0.00	0.00	0.00	120.00	0.00	120.00	120.00	0.00	120.00	138.50	0.00	138.50
Total			973.52	0.00	973.52	1198.00	0.00	1198.00	1198.00	0.00	1198.00	1383.00	0.00	1383.00
**Inclusive of works outlay in the Ministry of Urban Development*														

Annexure - VI

MINUTES OF THE NINTH SITTING OF THE STANDING COMMITTEE ON ENERGY (2011-12) HELD ON 12TH APRIL, 2012 IN COMMITTEE ROOM 'D' PARLIAMENT HOUSE ANNEXE, NEW DELHI

The Committee met from 1430 hrs. to 1600 hrs.

PRESENT

Shri Motilal Vora - in the Chair

2. Dr. Baliram
3. Shri Adhir Ranjan Chowdhury
4. Shri Syed Shahnawaz Hussain
5. Shri Baliram Jadhav
6. Shri Shripad Yesso Naik
7. Shri Sanjay Nirupam
8. Shri Jagdambika Pal
9. Shri Ravindra Kumar Pandey
10. Shri C. Rajendran
11. Shri Baju Ban Riyan
12. Shri Sushil Kumar Singh
13. Shri Makansingh Solanki

RAJYA SABHA

14. Shri V.P. Singh Badnore
15. Shri Shyamal Chakraborty
16. Shri Bhagat Singh Koshyari
17. Shri Mohammad Shafi

SECRETARIAT

1.	Shri Brahm Dutt	-	Joint Secretary
2.	Smt. Abha Singh Yaduvanshi	-	Director
3.	Shri N.K.Pandey	-	Additional Director
4.	Shri Rajesh Ranjan Kumar	-	Additional Director

REPRESENTATIVES OF THE MINISTRY OF NEW AND RENEWABLE ENERGY

Sr. No.	Name	Designation
1.	Shri Gireesh B. Pradhan	Secretary
2.	Shri Rajarshi Bhattacharya	AS&FA
3.	Shri Tarun Kapoor	Joint Secretary
4.	Dr. N.P Singh	Scientist 'G'
5.	Dr. B. Bandyopadhyay	Scientist 'G'
6.	Shri D. Majumdar	CMD, IREDA

2. In the absence of the Chairman, the Committee chose Shri Motilal Vora, a Member of the Committee to act as Chairman for the sitting in accordance with Rule 258 (3) of the Rules of Procedure and Conduct of Business in Lok Sabha.

3. At the outset, the Chairman welcomed the Members of the Committee and the representatives of the Ministry of New and Renewable Energy (MNRE) to the sitting of the Committee and expressed concern over the reduced annual budget allocation to the Ministry against the proposed outlay. The Chairman appreciated the efforts of the Ministry in the development of the renewable energy sources particularly in wind energy and small hydro sectors and with regard to Jawaharlal Nehru National Solar Mission, he emphasized the need to have a constant vigil with regard to its progress and target achievement.

3. Thereafter, the Secretary, MNRE briefed the Committee on the Demands for Grants (2012-13) and made a power point presentation in this regard.

4. The Committee *inter-alia* discussed with the representatives of the MNRE the following important points:-

i) Targets vis-a-vis achievements under various programmes during the 11th Plan and targets for 2012-13.

ii) Perspective planning and strategies for 12th Five Year Plan.

iii) Requirement of funds for the various programmes of the Ministry during the year 2012-13 and actual allocation made thereto

iv) Programme-wise outlay vis-à-vis actual expenditure of the Ministry for the year 2011-12.

v) Performance of the Ministry under Grid-Interactive and off-grid Renewable Power Programme including National Solar Mission, Wind Energy, Small Hydro Projects, Biomass, Biogas besides Remote Village Electrification Programme and Renewable Energy Programmes in North-East Region,etc.

vi) Evacuation of power in Rajasthan.

vii) Need for greater emphasis on Research and Development activities in Renewables.

The Members sought clarifications on various issues relating to the subject which were responded to by the representatives of the Ministry. The Committee directed the representatives of the Ministry to furnish written replies to the queries which could not be replied during the sitting.

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

The Committee then adjourned.

MINUTES OF THE TENTH SITTING OF THE STANDING COMMITTEE ON ENERGY (2011-12) HELD ON 25TH APRIL, 2012 IN COMMITTEE ROOM 'C' PARLIAMENT HOUSE ANNEXE, NEW DELHI

The Committee met from 1500 hrs. to 1530 hrs.

PRESENT

Shri Motilal Vora - in the Chair

2. Dr. Baliram
3. Shri P.C. Chacko
4. Shri Adhir Ranjan Chowdhury
5. Shri Baliram Jadhav
6. Shri C. Rajendran
7. Shri Baju Ban Riyan

RAJYA SABHA

8. Shri V.P. Singh Badnore
9. Shri Shyamal Chakraborty
10. Shri Rama Chandra Khuntia
11. Shri Bhagat Singh Koshyari
12. Shri Jesudasu Seelam

SECRETARIAT

1.	Shri Brahm Dutt	-	Joint Secretary
2.	Smt. Abha Singh Yaduvanshi	-	Director
3.	Shri N.K.Pandey	-	Additional Director
4.	Shri Rajesh Ranjan Kumar	-	Additional Director

2. In the absence of the Chairman, the Committee chose Shri Motilal Vora, a Member of the Committee to act as Chairman for the sitting in accordance with Rule 258 (3) of the Rules of Procedure and Conduct of Business in Lok Sabha

3. At the outset the Chairman welcomed the Members to the sitting of the Committee, and apprised the Committee about day's agenda.

4. The Committee then took up for consideration three Draft Reports *viz*;

(i) 26th Report on Action Taken on the recommendations contained in the Tenth Report on 'Availability of Gas and Coal for Power Sector'.

(ii) 27th Report on Demands for Grants (2012-13) of the Ministry of New and Renewable Energy.

(iii) 28th Report on Demands for Grants (2012-13) of the Ministry of Power.

At the discussion, the Committee adopted the three draft Reports with minor modifications.

5. The Committee also authorized the Chairman to finalize the above-mentioned Reports after taking into consideration the consequential changes arising out of factual verification, if any, by the concerned Ministries and also to present the same to both the Houses of Parliament during the current session.

The Committee then adjourned.