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STANDING COMMITTEE ON ENERGY (2014-2015)

SIXTEENTH LOK SABHA

MINISTRY OF NEW AND RENEWABLE ENERGY

DEMANDS FOR GRANTS (2014-2015)

SECOND REPORT

LOK SABHA SECRETARIAT
NEW DELHI

December, 2014/*Agrahayana,* 1936 *(Saka)*

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(2014-2015)

(SIXTEENTH LOK SABHA)

MINISTRY OF NEW AND RENEWABLE ENERGY

DEMANDS FOR GRANTS
(2014-2015)

Presented to Lok Sabha on 22.12.2014
Laid in Rajya Sabha on 23.12.2014

LOK SABHA SECRETARIAT
NEW DELHI
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(2014-2015)

*Dr. Kirit Somaiya— *Chairman*

MEMBERS

Lok Sabha

2. Shri Om Birla
3. Shri M. Chandrakasi
4. Shri Ashwini Kumar Choubey
5. Shri Harish Chandra *alias* Harish Dwivedi
#6. Shri Deepender Singh Hooda
7. Shri Saumitra Khan
8. Shri Bhagat Singh Koshyari
9. Kunwar Sarvesh Kumar
10. Dr. Arun Kumar
11. Shri R.P. Marutharajaa
12. Shri Jagdambika Pal
13. Shri Ravindra Kumar Pandey
14. Shrimati Krishna Raj
15. Shri M.B. Rajesh
16. Shri Vinayak Bhaurao Raut
17. Shri Gutha Sukender Reddy
18. Shri Purno Agitok Sangma
19. Shri Devendra Singh *alias* Bhole Singh

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* Appointed as Chairman of the Committee *w.e.f.* 12th November, 2014 *vice* Shri Rajiv Pratap Rudy.

Nominated as member of the Committee *w.e.f.* 14th November, 2014.

20. Shri Malyadri Sriram
21. Shri Bhanu Pratap Singh Verma

Rajya Sabha

22. Shri V.P. Singh Badnore
^23. Shri Oscar Fernandes
24. Shri Ram Jethmalani
25. Shri Pyarimohan Mohapatra
26. Shri S. Muthukaruppan
27. Dr. K.P. Ramalingam
28. Shri Ananda Bhaskar Rapolu
29. Dr. Anil Kumar Sahani
30. Shri Mohammad Shafi
31. Shrimati Viplove Thakur

SECRETARIAT

1. Shri Devender Singh — *Additional Secretary*
2. Shri N.K. Pandey — *Director*
3. Shri Arun K. Kaushik — *Additional Director*
4. Smt. L. Nemjalhing Haokip — *Under Secretary*

^ Nominated as member of the Committee *w.e.f.* 9th December, 2014 *vice* Shri Rajiv Shukla.

INTRODUCTION

I, the Chairman, Standing Committee on Energy having been authorized by the Committee to present the Report on their behalf, present this Second Report on Demands for Grants of the Ministry of New and Renewable Energy for the year 2014-15.

2. The Committee took evidence of the representatives of the Ministry of New and Renewable Energy on 23rd September, 2014. 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 (2014-15).

3. The Report was considered and adopted by the Committee at their sitting held on 17th December, 2014.

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 recommendations of the Committee have been printed in bold letters in Part-ll of the Report.

NEW DELHI;
19 *December,* 2014
28 *Agrahayana,* 1936 *(Saka)*

DR. KIRIT SOMAIYA,
Chairman,
Standing Committee on Energy.

REPORT

PART I

NARRATION ANALYSIS

CHAPTER I

INTRODUCTORY

Energy requirement is vital component and directly related to the economic growth of a country. Currently, India has an installed capacity of 253389.48 MW (as on 30.08.2014), out of which 32425 MW accounts for new and renewable source of energy mainly from wind, solar, biomass 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 Role of the MNRE includes facilitating research, design, development, manufacture and deployment of new and renewable energy systems/devices for power generation, portable and stationary applications in rural, urban, industrial and commercial sectors and transportation, through:—

(i) Resource assessment, Technology Mapping, Benchmarking, and related activites;

(ii) Identify Research, Design and Development thrust areas and facilitate work on the same;

(iii) To develop Standards, specifications and performance parameters at par with international levels, and facilitate industry in attaining the same;

(iv) Align costs of new and renewable products and services with international levels, and facilitate industry in attaining the same;

(v) Appropriate international level quality assurance accreditation, and facilitate industry in obtaining the same;

(vi) Provide sustained feed-back to manufacturers on performance parameters of new and renewable energy products and service with the aim of effecting continuous up-gradation so as to attain State of the art in the shortest possible time span;

(vii) Facilitate industry in becoming internationally competitive;

(viii) Identify areas in which new and renewable energy products and services need to be deployed in keeping with the goal of national energy security and energy independence; and

(ix) Deployment strategy for various indigenously developed and manufactured new and renewable energy products and services;

1.4 The MNRE 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.

CHAPTER II

PROGRESS OF 12TH FIVE YEAR PLAN

The Ministry has proposed a capacity addition of 29,800 MW during the 12th Plan Period for which a financial requirement of Rs. 40,000/- crore was projected. However, an amount of Rs. 19113 crore has been allocated for the entire Plan period. The details of the physical targets and financial allocation under various Programme is given in Annexure I.

2.2 When queried about the physical and financial achievements during the first two years of the 12th Plan *i.e.* 2012-13 and 2013-14, the Ministry furnished:—

Table 2.2 Physical and Financial achievements during 2012-13 and 2013-14

Sl. No.	Programme/system	2012-13		2013-14	
		Target	Ach.	Target	Ach.
1	2	3	4	5	6
	GRID POWER (Capacities in MW)				
1.	Wind Power	2500.0	1698.8	2500.0	2083.3
2.	Small Hydro	350.0	236.9	300.0	171.4
3.	Bio Power	105.0	114.7	105.0	101.6
4.	Bagasse Cogeneration	350.0	352.2	300.0	310.9
5.	Waste to Power	20.0	6.4	20.0	10.5
6.	Solar Power	800.0	754.1	1100.0	962.1
	Total	4125.0	3163.1	4325.0	3639.8
	OFF-GRID (Capacities in MWeq)				
7.	Waste to Power	20.0	13	10.0	17.1
8.	Non-bag Cogen.	60.0	88.6	80.0	60.7
9.	Biomass Gasifier	11.50	8.1	10.0	7.7
10.	Aero-Gens/Hybrid systems	0.50	0.4	1.0	0.1
11.	Solar Photovoltaic Systems	30.00	34.4	40.0	49.6

1	2	3	4	5	6
12.	Water Mills (WMs) Micro/mini-hydel plants	2.0	2.08	2.0	1.6
13.	Bio-gas based energy system	2.0	0.74	2.0	0.5
	Total	126.0	148.1	145.0	137.3
14.	Remote Village Electrification (Nos. Villages + Hamlets)	-	975	-	860
15.	Family type Biogas Plants (No. in Lakh)	1.3	1.2	1.1	0.85
16.	Solar Water Heating - collector area (ml. m2)	0.6	1.4	0.5	1.1

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

2.3 The year-wise details of B.E/R.E. and actual expenditure during first two years (2012-13 and 2013-14) of the 12th Plan as furnished by the Ministry is given below:—

Table 2.3 : BE/Re and Actual Expenditure during first two years of 12th Plan

(Rs. in crore)

Sl. No.	Programme Component	2012-13			2013-14		
		B.E	R.E.	Actual	B.E	R.E.	Actual
1.	Grid-Interactive and Distributed Renewable Power	825.00	759.00	748.73	1030.00	1218.66	1132.65
2.	Renewable Energy for Rural Applications	175.00	124.00	116.31	150.00	113.29	109.21
3.	Renewable Energy for Urban, Industrial and Commercial Applications	22.00	15.50	15.17	21.00	10.10	10.00
4.	Research, Design and Development in Renewable Energy	192.00	126.00	108.90	158.00	148.50	136.97
5.	Supporting Programmes	169.00	125.50	117.68	160.00	248.13	230.20
	Total Gross Budgetary Support (GBS)	1383.00	1150.00	1106.79	1519.00	1738.68	1619.03

2.4 When asked about the action plan and strategy adopted by the Ministry to achieve the targets set for the 12th Plan, the Ministry in a note furnished the following:—

- Ministry of Renewable Energy and Ministry of Power working in coordination for achieving the targets for grid connected RE targets.

- Organising State Meeting with the Principal Secretaries and Head of the Nodal Agencies on quarterly basis.

- Appointed State Nodal Officers to coordinate issue relating to particular State in implementation of Renewable Energy programme.

- Close Coordination with Ministry of Defense and Railways.

- PSUs of Power and Coal Sector to encourage Renewable Energy programme under their Social Responsibilities.

- State to take up Ultra Mega Power Plants and canal based Solar Power Projects.

2.5 The Ministry has further stated that in order to accelerate the pace of implementation of renewable energy programmes in the country, they are aiming towards engaging other Ministries and public sector undertaking to encourage them to take up renewable energy development projects through their budgets and that they had started this process with the Ministry of Railways and proposes to carry it forward.

2.6 On a query regarding the initiatives taken with the Ministry of Railways in this regard, the Committee were informed as under:

> "8.82 MW solar power projects at an approx. cost of about Rs. 70 crore under Railway funding with subsidy support of MNRE has been proposed.
>
> 500 MW mainly under PPP model wherein the land/roof top space will be provided by Railways and developer will set up its own plant. Alternatively, Railways can also procure power directly from a developer who can set up the plant at any location. Railways will be required to sign a long-term power purchase agreement at a pre-determined rates."

2.7 The Ministry has further stated that to harness renewable energy, the Railways has set up a Joint Venture Railways Management Company. The details of progress made by the Railways are as follows:—

a. Capacity Already Installed: About 7 MW solar based lighting systems at about 500 Railway Stations, 4000 Level Crossing (LC) gates, 400 street lights, office buildings, solar water heaters (6.7 lakhs litres per day) etc.

b. Sanctioned works under Railway funding and their Progress:

(i) 1 MWp solar plants at Katra Railway Station under Udhampur-Srinagar-Baramulla-Rail Link (USBRL) funding. Tender opened on 16th Sept., 2014 and contract awarded on 7th October, 2014.

(ii) 7.82 MW of solar plants under Railway funding at 200 railway stations, 2000 LC gates, 26 nos. of roof top locations under Railway funding. About 40% subsidy for these works already sanctioned by MNRE. Tender scheduled to open on 16.10.2014.

(iii) Harnessing 1 MW solar energy at rooftop space at New Delhi Station in PPP model: Proposal under consideration by NR.

(iv) 30 KWp solar PV panel at Rail Bhawan, New Delhi: Work has been commenced an likely to be commissioned by November, 2014.

c. Future Plan: To harness 500 MWp solar energy in next five years mainly under PPP model. MNRE has been requested to sanction the Viability Gap Funding (VGF) for this project.

2.8 Informing the Committee about the long-term plan of the Ministry for harnessing renewable energy, the Ministry in a note stated as under:—

"The Ministry has proposed a capacity addition of 29,800 MW during the 12th Plan period. This includes 15,000 MW from Wind, 10,000 MW from Solar, 2,100 MW from Hydro and 2,700 MW from Biomass including Waste to Energy. For these, a financial requirement of Rs. 40,000/- crore was projected in the 12th Plan proposal of MNRE. Detailed discussions were held in the Planning Commission on various aspects and activities proposed in the MNRE

12th Plan. The Planning Commission has indicated an allocation of Rs. 19,113 crore towards renewable energy activities. The allocations for renewable energy programmes during first two years of the 12th Plan *i.e*. 2012-13 (Rs. 1,385 crore) and 2013-14 (Rs. 1,521 crore) have been substantially lower than the requirements projected by the Ministry. However, during 2014-15 an amount of Rs. 2,519 crore has been provided at BE level. This would affect the overall targets of the 12th Plan. However, in order to accelerate pace of implementation of renewable energy programmes in the country, the Ministry is now aiming towards engaging other Ministries and Public Sector Undertakings to encourage them to take up renewable energy development projects through their budgets.

The Ministry had already started this process with the Ministry of Railways and proposes to carry it forward. As a result of these efforts, the Ministry of Railways has made certain announcements through their budget concerning renewable energy including setting up of 75 MW wind projects and energizing 1000 level crossings with solar power. Ministry of Railways have also proposed to set up a Railway Energy Management Company to harness potential of solar and wind energy. The Ministry is also posing projects to get financial support from the National Clean Energy Fund operated by the Ministry of Finance and also for viability gap funding. The Ministry proposes to maintain its overall targets for the 12th Plan at this stage to be achieved with the best endeavour in association with other Ministries and PSUs who have interest and commitment to renewable energy."

CHAPTER III

ANALYSIS OF DEMANDS FOR GRANTS OF MNRE FOR 2014-15

3.1 The MNRE presented Demand No. 69 to Parliament for the financial year 2014-15 on 24th July, 2014. The Plan and Non-Plan provisions made in the Revenue and the Capital Sections of the Budget are as under:—

Demand No. 69

Table 3.1 : Plan and Non-Plan Provisions

(Rs. in crore)

	Plan	Non-Plan	Total
Revenue Section	846.00	15.39	861.39
Capital	95.00	—	95.00
Grand Total (Revenue + Capital)	941.00	15.39	956.39

3.2 A statement showing the details of the Budget Estimates for the year 2014-15 *vis-a-vis* that of Budget Estimates/Revised Estimates (BE/RE) of 2013-14 and Actuals of 2012-13 is given at Annexure II.

3.3 The Central Plan Outlay of the Ministry of New and Renewable Energy during the year 2013-14 and for the year 2014-15 are given under Table 3.3.

Table 3.3 : Central Plan Outlay

(Rs. in crore)

	2013-14		2014-15
	BE	RE	BE
Budgetary Support	1521.00	1737.67 (Includes Rs. 1313.16 from NCEF*)	2519.00 (Includes Rs. 1578 crore from NCEF*)
IEBR	394.00	2966.23	3000.00
Total	3915.00	4703.90	5519.00

* NCEF= National Clean Energy Fund.

3.4 The total outlay of the Ministry for the financial year 2014-15 is Rs. 5,519 crore. Out of this, the Internal and Extra Budgetary Resources (IEBR) constitutes Rs. 3,000 crore and Gross Budgetary Support (GBS) accounts for Rs. 2,519 crore which includes Rs. 1,578 crore from NCEF. A detailed statement in this regard as provided by MNRE is given below:—

Table 3.4 : Total plan outlay for the financial year 2014-15

Sl.No.	Programme	Proposals		Actual	
		Physical	Finan-cial	Physical	Finan-cial
1	2	3	4	5	6
I.	GRID-INTERACTIVE AND DISTRIBUTED RENEWABLE POWER				
(A)	Grid-interactive (MW)				
1.	Wind Power	3000.0	1215.00	2,000.00	267.00
2.	Small Hydro Power	250.0	135.00	250.00	100.00
3.	Solar Power	1100.0	900.00	1,100.00	750.00
4.	Biomass Power/Bagasse Cogeneration	400.0	60.00	400.00	40.00
5.	Urban and Industrial Waste to Energy	20.0	25.00	20.00	13.00
	Sub-total (A)	4,770	2335.00	3,770.00	1,170.00
(B)	Off-Grid/DRPS (MW)				
1.	Solar appls. including ST systems Roof Top	110.00	750.00	110.00	817.50
2.	Energy from Urban/Muncipal/Indus. Wastes	10.00	10.00	10.00	7.50
3.	Non-Bagasse Cogeneration in Industry	80.00	15.00	80.00	8.00
4.	Biomass Gasifiers	12.00	12.00	8.80	3.00
5.	Bio-gas based energy	2.00	15.00	0.00	0.00
6.	Micro hydel and Watermills	2.00	15.00	4.00	7.00
7.	Aero-generators/Hybrid systems	1.00	14.00	0.50	5.00
	Sub-Total (B)	217	831.00	213.30	848.00
	I-Total (A) + (B)	4,987	3166.00	3,983.30	2,018.00
II.	RENEWABLE ENERGY FOR RURAL APPLICATIONS				
1.	RVE Programme (No. of villages sanctioned)	1000.00	100.00	250.00	14.00

1	2	3	4	5	6
2.	Family type biogas plants (No. of Biogas in lakhs)	1.20	152.00	1.10	129.50
3.	Cook Stove (No. of cookstoves in lakh)	7.50	100.00	7.50	12.00
4.	Solar Cookers (No. of Solar Cookers)	0.00	0.00	10,000.00	2.00
	II-Total		352.00		157.50
III.	RENEWABLE ENERGY FOR URBAN, INDUSTRIAL AND COMMERCIAL APPLICATIONS				
1.	Solar Thermal Systems		250.00		included in offgrid Solar Applications
2.	Green buildings		2.50		2.00
3.	Solar Cities/pilot/related activities		25.00		8.00
4.	Alternate fuel vehicles		10.00		4.00
	III-Total		287.50		14.00
IV.	RESEARCH, DESIGN AND DEVELOPMENT IN RENEWABLE ENERGY				
1.	Bio-Energy		26.00		14.00
2.	Solar Energy		110.00		45.00
3.	Wind Energy				5.00
4.	Small Hydro Power		15.00		6.00
5.	New Technology		40.00		20.50
6.	Solar Energy Centre (SEC)		50.00		35.00
7.	C-WET		30.00		12.00
8.	NIRE		15.00		12.00
	IV-Total		286.00		149.50
V.	SUPPORT PROGRAMMES				
1.	Information and Publicity programmes (incl. SADP)		30.00		25.00
2.	International Relations		1.50		1.00
3.	HRD and Training		25.00		13.00

1	2	3	4	5	6
4.	Monitoring and Evaluation		11.00		1.00
5.	Plan Secretariat (Administration)		21.00		23.00
6.	IREDA Equity		100.00		40.00
7.	e-governance		2.00		2.00
8.	Support to SNA		25.00		12.00
9.	Solar Energy Corporation		1131.00		55.00
	V-Total	0	1346.50	0.00	172.00
	Grand Total		5438.00	3,983.30	2,511.00
	Externally Aided Projects (EAP)		11.00	10.00	8.00
			5449.00	3,993.30	2,519.00

3.5 The Committee were also informed that an allocation of Rs. 5,449 crore was sought by the Ministry in its Annual Plan for the year 2014-15. However, an amount of Rs. 1,519 crore was allocated as BE 2014-15 by Planning Commission and Ministry of Finance at the Interim Budget stage which was increased to Rs. 2,519 crore in the Regular Budget for 2014-15.

3.6 The Committee desired to know whether the Ministry will be able to finance their proposed programmes with the reduced allocation, the Ministry in a written note stated:—

> "In the Interim Budget-2014-15, Plan outlay was Rs. 1,519 crore against the outlay of Rs. 5,449 crore proposed for the year. In continuation of funding pattern set at the time of finalization of RE 2013-14, out of BE of Rs. 1,519 crore, gross budgetary support was only Rs. 441 crore and remaining Rs. 1,078 crore to be funded from NCEF. In the Regular Budget presented in Parliament in July, 2014, the BE of the Ministry was increased to Rs. 2,519 crore which includes Rs. 1,000 crore for the Budget announcements essentially for solar energy programmes. In effect, there was no increase in BE for the regular on-going programmes of the Ministry. The physical targets for 2014-15 under the ongoing programmes were fixed keeping in view the BE provided in the Interim Budget. The targets are therefore not fixed in view of proposed outlay of Rs. 5,449 crore."

3.7 During the evidence, the Committee queried about the steps taken by the Ministry to overcome financial constraints in achieving the

physical targets, the Ministry in a note stated:—

> "The Ministry is developing proposals for availing funding under National Clean Energy Fund (NCEF) to meet the physical targets. In addition the Ministry also cancelling the sanctioned projects where progress is so far nil to reduce the liabilities."

3.8 When the Committee further queried about the total clean energy fund collected, the Ministry in a note furnished:—

> "The Department of Expenditure, Ministry of Finance is the nodal department in the Government of India for National Clean Energy Fund (NCEF) purposes. The detailing of the total Funds are maintained by them. However, as per broad estimates an amount of around Rs. 10,000 crore has been collected upto the year 2013-14.
>
> NCEF grant of Rs. 10254.41 crore has been recommended by the IMG for the renewable energy projects submitted by MNRE. Against this so far Rs. 484,44 crore has been received so far."

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

Table 3.9 : Annual Plan Outlay during last two years

(Rs. in crore)

Year	BE	RE	Actual
2012-13	1385.00	1150.00	1106.79
2013-14	1519.00	1738.68	1619.03

3.10 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:—

> "The major programmes such as Wind Power and Solar Power were affected due to shortage of funds. Therefore pending liabilities created for future. However, targets were affected in Wind Power due to withdrawal of Accelerated Depreciation during 2012-13 and 2013-14."

3.11 The Committee further asked about quarter-wise expenditure made during last three years. The Ministry furnished the following

information:—

Table 3.11 Quarter-wise expenditure during last three years

(Rs. in crore)

Year	BE	RE	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total
2011-12	1200.00	1360.80	271.49	403.07	180.85	493.42	1348.83
2012-13	1385.00	1150.00	153.52	501.15	172.35	279.77	1106.79
2013-14	1519.00	1738.68	519.59	274.32	285.88	539.24	1619.03

3.12 When enquired whether the expenditure during the last three years was as per the plan and norms, the Ministry replied:—

> "The quarterly expenditure of the Ministry during last three year's and the current year has been quite as per plan and the norms. It may be seen from the expenditure table given above that it has been fairly distributed in each quarter as envisaged."

CHAPTER IV

GRID INTERACTIVE AND OFF-GRID RENEWABLE POWER

The Physical achievement *vis-a-vis* targets during the years 2012-13 and 2013-14 alongwith the physical targets for 2014-15 under Grid and off-Grid power as furnished by the Ministry are given below:—

Table 4.1 : Physical Targets and Achievements

Sl.No.	Programme/system	2012-13		2013-14		Target
		Target	Ach.	Target	Ach.	2014-15
	GRID POWER (Capacities in MW)					
1.	Wind Power	2500	1698.8	2500	2083.3	2000.00
2.	Small Hydro	350	236.9	300	171.4	250.00
3.	Bio Power	105	114.7	105	101.6	100.00
4.	Bagasse Cogeneration	350	352.2	300	310.92	300.00
5.	Waste to Power (Industrial/Urban)	20	6.4	20	10.5	20.00
6.	Solar Power	800	754.1	1100	962.1	1100.00
	Total	4125	3163	4325	3640	3770.00
	OFF-GRID (Capacities in MWeq)					
7.	Waste to Power	20	13.8	10	17.1	10.00
8.	Biomass (Non-bag Cogen)	60	88.6	80	60.7	80.00
9.	Biomass Gasifiers	11.5	8.1	10	7.7	8.80
10.	Aero-Gens/Hybrid systems	0.5	0.4	1	0.1	0.5
11.	SPV Systems	30	34.4	40	49.6	60.00
12.	Water Mills (WMs)/Micro/ mini-hydel plants	2	2.08	2	1.6	4.00
	Total	124	147.38	143	136.8	163.30

4.2 When asked about the financial utilization *vis-a-vis* allocation during the years 2012-13 and 2013-14 alongwith financial allocation for the year 2014-15, the Ministry furnished:—

Table 4.2 : Financial Utilisation *vis-a-vis* Allocation

(Rs. in crore)

Sl. No.	Programme/ System	2012-13			2013-14			2014-15
		B.E.	R.E.	Actual	B.E.	R.E.	Actual	B.E.
	GRID POWER							
1.	Wind Power	45.00	44.75	44.71	230.00	301.00	300.43	267.00
2.	Small Hydro	150.00	141.75	141.48	135.00	107.68	107.61	100.00
3.	Bio Power	100.00	71.50	64.09	85.00	34.74	34.61	53.00
4.	Solar Power	80.00	80.00	79.83	150.00	150.00	149.73	750.00
	Total	375.00	338.00	330.11	600.00	593.42	592.37	1170.00
	OFF-GRID							
5.	Wind Power	2.00	2.00	2.00	5.00	6.00	5.99	5.00
6.	Hydro Power	14.00	9.50	9.44	7.00	7.00	7.00	7.00
7.	Bio Power	29.00	19.50	19.40	18.00	26.25	23.55	18.50
8.	Solar Power	405.00	390.00	387.78	400.00	585.99	503.74	817.50
	Total	450.00	421.00	418.62	430.00	625.24	540.28	848.00

4.3 During the evidence the Committee desired to know the per unit cost of renewable energy generated from various renewable energy sources, the Ministry in a note furnished:—

Table 4.3 : Per unit cost of Renewable Energy

Source	Estimated initial capital cost (Rs. in crore/MW)	Estimated cost of electricity generation (Financial) *(Rs./kWh)
Small Hydro Power	7.00-8.50	3.00-3.75
Wind Power	5.50-6.00	3.75-4.25
Biomass Power	5.50-6.00	4.50-5.65
Bagasse Cogeneration	5.00-5.30	4.25-5.50
Energy from Urban/ Industrial Waste	4.00-12.00	2.50-5.00
Solar Power	8.00-12.00	7.00-11.00

A. Solar Energy

4.4 The country's daily average solar energy incident varies from 4-7 KWh per square metre resulting in generating nearly 30-50 MWp per square kilometer.

4.5 When asked the estimated potential *vis-a-vis* utilization of solar energy in the country, the Ministry furnished:—

Table 4.5 : Commissioning Status of Grid Connected Solar Power Projects under JNNSM

Sl. No.	State/UT	Total MNRE Projects MW	State Policy MW	RPO MW	REC Scheme MW	Pvt. Initiative (Roof top) MW	CPSUs MW	Total commissioned capacity till 11.8.14 (MW)
1	2	3	4	5	6	7	8	9
1.	Andhra Pradesh	44.75	90.19		28.1	1.1		164.14
2.	Arunachal Pradesh	0.025						0.025
3.	Chhattisgarh	4			3.1			7.1
4.	Gujarat	0	863.05	50	6			919.05
5.	Haryana	7.8					5	12.8
6.	Jharkhand	16						16
7.	Karnataka	5	30				9	44
8.	Kerala	0.025						0.025
9.	Madhya Pradesh	5.25	224.05		75.78		50	355.08
10.	Maharashtra	47	125		108.75			280.75
11.	Odisha	12	5		2.5		10	29.5
12.	Punjab	9			7.52			16.52
13.	Rajasthan	484.5	23.1	40	190.35			737.95
14.	Tamil Nadu	16	3		80	0.5		99.5
15.	Uttar Pradesh	12	2				15	29
16.	Uttarakhand	5						5

1	2	3	4	5	6	7	8	9
17.	West Bengal	2.05	5					7.05
18.	Andaman and Nicobar	0.1					5	5.1
19.	Delhi	0.335			2.14	2.99		5.465
20.	Lakshadweep	0.75						0.75
21.	Puducherry	0.025						0.025
22.	Chandigarh	2						2
23.	Others	0.79						0.79
	TOTAL	674.4	1370.39	90	504.24	4.59	94	2737.62

4.6 Jawaharlal Nehru National Solar Mission was launched on 11th January, 2010 which targets include (i) deployment of 20,000 MW of grid connected solar power by 2022, (ii) 2,000 MW of off-grid solar applications including 20 million solar lights by 2022, (iii) 20 million sq. m. solar thermal collector area, (iv) to create favourable conditions for developing solar manufacturing capability in the country; and (v) support R&D and capacity building activities to achieve grid parity by 2022. The Mission is to be implemented in three phases.

4.7 The Committee desired to know about the First Phase achievement *vis-a-vis* targets (Physical) the Ministry informed:—

Table 4.7 : Phase I achievements *vis-a-vis* Targets

Application Segment	Target for Phase I (2010-13)	Achievements Phase I
Grid solar power (large plants, roof top and distribution grid plants)	1,100 MW	1684.43 MW commissioned (including those under State initiative)
Off-grid solar applications	200 MW	252.5 MW commissioned
Solar Thermal Collectors (SWHs, solar cooking, solar cooling, Industrial process heat applications, etc.)	7 million sq. metres	7.001 million sq. metre installed

4.8 When asked the actual financial expenditure *vis-a-vis* allocation during the first phase of the Solar Mission, the Ministry furnished:—

Table 4.8

Year	BE/RE	Actual Expenditure
2010-11	393.49	391.65
2011-12	710.00	707.35
2012-13	705.09	655.54

4.9 On being enquired about the physical targets for the Second Phase of the Mission, the Ministry furnished:—

Table 4.9 : IInd Phase Targets and achievements till 1.9.2014

Application Segment	Target for Phase 2 (2013-17)	Achievements till 01/09/2014
Grid solar power (large plants, roof-top and distribution grid plants)	9,000 MW (3000 MW with Central Support and 6000 MW by States under State Policies)	2743 MW commissioned
Off-grid solar applications	800 MW	87.77 MW commissioned
Solar Thermal Collectors (SWHs, solar cooking, solar cooling, Industrial process heat applications, etc.)	8 million sq. metres	1.621 million sq. metre installed

4.10 With regard to Second Phase financial allocation, the Ministry furnished:—

Table 4.10

Year	BE/RE	Actual Expenditure
2013-14	887.09	792.37
2014-15	1824.93	-

4.11 When the Committee desired to know the detailed action plan of the Ministry to achieve the target of JNNSM, the Ministry in a reply stated:—

> In order to achieve the targets set for Phase-II of JNNSM the Ministry is pursuing simultaneously several projects which have time-frame

ranging from two years to five years. The details of these programmes are as under:

- Draft Cabinet note is under circulation for a 1000 MW (with Domestic Content Requirement) Grid-Connected Solar PV Power Projects by Defence Establishments under Ministry of Defence and Para-Military Forces.

- Draft Cabinet note is under circulation for a 1000 MW (with Domestic Content Requirement) Grid Connected Solar PV Power Projects by Central Public Sector Undertakings (CPSUs).

- Draft EFC note for Setting up of Solar Parks and Ultra Mega Solar Power Parks (25 Nos. totalling 20,000 MW) is under circulation.

- Cabinet note has been initiated for 15,000 MW of Grid Connected Solar PV Projects under Bundling Mechanism with unallocated Conventional power. Out of this 2500 MW would be with DCR. To be implemented in three phases of 3000, 5000 and 7000 each.

- A Solar Scheme for setting up of 90 MW Grid connected Solar PV Power Project on Canal Top/Canal Banks has been cleared by the Planning Commission. State have been requested to submit proposals.

- Projects have been allotted for 750 MW (375 MW with DCR) under the Grid Connected Solar PV Power Projects with Viability Gap Funding (VGF), Power Sale Agreement (PSA) for 300 MW signed.

- 1,00,000 Solar Power Driven Agricultural pump sets under the ongoing scheme have been finalized.

- Grid Connected Rooftop Solar PV Systems totalling 255 MW is under implementation.

- Proposal of a 1000 MW (500 MW with DCR proposed) of Grid Connected Solar PV Power Projects with VGF pending with M/o Finance for approval by IMG for funding under NCEF.

- Sites identified of two Solar Thermal Power Pilot Projects of 50 MW each with support of 40% grant from NCEF and 50 % debt from ADB.

4.12 On a query regarding arrangements done for evacuation of grid connect solar power generation capacity coming up under JNNSM, the Ministry in a note stated:—

"On MNRE's request the Power Grid Cooperation of India Ltd. (PGCIL) prepared a report 'Green Energy Corridors' for transmission infrastructure development for the likely renewable power Andhra Pradesh, Gujarat, Himachal Pradesh, Karnataka, Maharashtra, Rajasthan, Tamil Nadu and also Jammu and Kashmir. The report identified intra and inter-State transmission systems with locations and voltage levels, and also investment requirement for the same. In addition it suggested establishment of Renewable Energy Management Centers (REMCs) to serve as single source information repository and coordination point.

The Central Electricity Authority has appraised PGCIL's estimates and suggested that in addition to REMCs and associated activities (Rs. 3011 crore) around Rs. 32,000 crore would be required to strengthen and develop renewable power evacuation and transmission infrastructure for the planned renewable power capacity addition up to 2017.

A Joint Declaration of Intent for German loan assistance of Euro 1 billion for Green Energy Corridors was signed on 11 April 2013.

In a meeting held in Department of Economic Affairs (DEA) under the Chairmanship of Secretary, DEA on 14 May 2013, *inter-alia* it was decided that MNRE will be the nodal central Ministry to pilot the Green Energy Corridors scheme and prepare a composite proposal.

In July 2013, German side has agreed for the first tranche of concessional loan of Euro 250 million and Euro 2 million as technical assistance.

(a) In some places the capacity of the evacuation system is not adequate and hence the Solar Power Developers are asked to reduce generation at times.

(b) The inter-connection point is very far from the project site and hence the Solar Power Developer (SPD) has to construct its own evacuation lines up to the interconnection point. In several cases, each SPD has to construct line separately and therefore parallel lines are erected. This leads to wastage of land and resources.

(c) During implementation of JNNSM Phase-I, Right of Way (RoW) issues were faced by some Developers while construction of the transmission line for connectivity to State Grid resulting into delays.

(d) CTU Transmission Charges and losses for inter-State transfer of Solar Power have been waived off by CERC for the Projects being commissioned under JNNSM scheme till 30* June 2014. CERC has issued draft extending upto 30.07.2017. Similar action is desirable for STU Charges and Losses for JNNSM Scheme.

Solution: Proposals for expansion and upgradation of transmission network with State Transmission Utilities (STU) as well as Central Transmission Utilities (CTU) have been planned."

4.13 When the Committee asked the details about the solar canal based projects during the meeting with the representatives of the Ministry of Power, the Ministry in a note replied:—

"Hon'ble Finance Minister, Shri Arun Jaitley in his Budget Speech 2014-15 has announced that Rs. 100 crore for the development of 1 MW solar plants on the banks of canals. The Ministry is accordingly proposing a Scheme for the Development of Grid-connected Solar Power Plants on Canal-Tops/ Canal Banks.

MNRE through this scheme proposes to encourage the State Power Generation Companies/State Government Utilities/any other State Government Organization/PSUs to set up grid-connected solar PV power plants of 1-10 MW capacity with an aggregate capacity of 90 MW on Canal Tops/Canal Banks by providing capital subsidy of Rs. 3cr/MW; 40% at time of sanctioning and balance 60% on commissioning of plant. Besides gainful utilization of the unutilized space over Canal Tops/unutilized land on Canal Banks for power generation, the plants will enable the participating States to meet their Renewable Purchase Obligation (RPO) mandates and also provide employment opportunities to local population. It is proposed that these plants will be sanctioned over a period of 2 years and would be required to be commissioned over a period of 15 months from date of sanction and that all these plants would get installed over a span of 3 years.

States of Andhra Pradesh, Tripura, Kerala, Gujarat, Karnataka and Punjab have shown interest in setting up Canal Top/Canal Bank Grid Connected Solar Power Projects.

4.14 During the evidence, the Committee pointed out the requirement of vast area for installation of solar power plants. When asked about the research being carried out to increase the efficiency and reduction in space required for solar power plants, the Ministry in a note stated:—

"Various research projects have been sanctioned by MNRE to enhance the efficiency of solar cells and modules.

The following are the main R&D projects

(i) National Centre for excellence for Photovoltaic Research and Engineering (NCPRE) is doing project on efficiency improvement of crystalline solar cells upto 20%.

(ii) Efficiency improvement and cost reduction of thin film solar cells by Bengal Engineering and Science University (BESU) Kolkata; Cochin University, Cochin; IIT-Kanpur; Jain University, Bangalore; CSIR labs and Amrita Nano University, Cochin. Efficiency improvement also reduces the space required for Solar Power plant."

4.15 Further, the Committee raised the issue regarding plan for solar plants in Bihar, Ladakh (Jammu and Kashmir) and Lahul and Spiti (HP). The Ministry in a note replied:—

"Plan for Solar Plants in Bihar, Ladakh (Jammu and Kashmir) and Lahul and Spiti (HP) as raised by Hon'ble Chairman and Member of Standing Committee on Energy during its meeting held on 23.9.2014 is as under:

This Ministry is rolling out a scheme to set up 25 solar parks, each with a capacity of 500 MW and above; thereby targeting around 20000 MW of solar power installed capacity. These solar parks will be put in place in a span of 3 years and the solar projects may then come up as per demand and interest shown by developers.

In this regard, the Ministry has forwarded the Draft Scheme for Development of Solar Parks to all States/UTs *vide* letter of even no. dated 01.08.2014 and subsequently requested them to identify the land for setting up of Solar Parks *vide* letter of even no. dated 08.08.2014.

The Solar Parks would be developed by an Implementing Agency as provided in the draft Scheme. The implementing agency will acquire land and create common infrastructure facilities including sub-station for evacuation.

MoU for setting up of Solar Power Project in Leh and Kargil of Jammu and Kashmir has been signed. A draft MoU for the stated Solar Park has been forwarded to all States/UTs including Bihar and Himachal Pradesh to be executed between Government of India and the State/UT Governments."

4.16 When asked about the technological upgradation undertaken with regard to solar photovoltaic system and solar thermal so as to make them competitive, cost effective and pocket friendly, the Committee were informed:—

"Today, majority of Solar PV modules (85% to 90% of the global annual market) are based on Crystalline silicon. Crystalline silicon PV modules are expected to remain a dominant PV technology until at least 2020, with a forecasted market share of about 50% by that time (Energy Technology Perspectives 2008). This is due to their proven and reliable technology, long life, and abundant primary resources. R&D activities are underway to improve the efficiency and effectiveness of resource consumption through materials reduction, improved cell concepts and automation of manufacturing. Solar Thermal technology is an evolving technology wherein effort is being made in respect of storage of Energy for better dispatch ability."

4.17 Regarding Ground Measurement Solar Radiation Stations raised by the Committee during the evidence, the Ministry furnished:—

Table 4.17

Sl. No.	States	Stations commissioned in Phase-I	Stations proposed in Phase-II
1	2	3	4
1.	Andhra Pradesh	6	3
2.	Gujarat	11	2
3.	Haryana	1	1
4.	Madhya Pradesh	3	4
5.	Karnataka	5	1

1	2	3	4
6.	Rajasthan	12	-
7.	Chhattisgarh	1	1
8.	Ladakh	1	-
9.	Maharashtra	3	6
10.	Puducherry	1	-
11.	Tamil Nadu	6	-
12.	Kerala	-	2
13.	Jharkhand	-	3
14.	Odisha	-	4
15.	West Bengal	-	3
16.	Uttar Pradesh	-	5
17.	Bihar	-	3
18.	Punjab	-	2
19.	Jammu and Kashmir	-	1
20.	Himachal Pradesh	1	2
21.	Uttarakhand	-	2
22.	NE States	-	10
23.	UTs	-	5
	Total	51	60

4.18 When asked about the Solar Radiation Resource Assessment (SRRA), the Ministry in a note stated:—

> "Solar radiation of equal quantity is not available through-out the day due to various factors including clouds. It also varies with season, latitude, longitude and altitude of the location. Climatic and atmospheric conditions influence the short wave flux reaching the earth surface. Aerosol, dust and water vapour have particular impact in the attenuation process. Hence, it becomes necessary to have the knowledge of solar resource in adequate details quite accurately, for making better design of solar power plant, for achieving higher efficiency of SPV panels and increased power generation.
>
> For a continuous spatial coverage of wide region, satellite based irradiation estimates are generally used which provides moderate to good accurate measurements. However, the best quality data is provided by ground based measurements which are also used for

validating or benchmarking and improving the satellite derived data. Thus establishment of ground solar resource assessment infrastructure in India would be of great importance, with assured 300 days of sunshine in most of India."

4.19 How to meet the challenges in the implementation, the Ministry observed:—

"To meet the specific challenges in the implementation of JNNSM, MNRE has launched a unique and one of its kind in the world, a network of 111 nationwide automatic solar and meteorological measuring stations, called Solar Radiation Resource Assessment (SRRA) Stations in two phases. This project is being implemented by C-WET, Chennai, an autonomous R&D institution under the Ministry, because of its rich experience in Wind Resource Assessment and Development of Wind Atlas for the nation. To implement this project C-WET, Chennai has started an exclusive SRRA Unit on mission mode project and all 111 SRRA stations completed in two phases. The data from all the stations is being received at the Central Server established at C-WET, Chennai."

4.20 On the question of imported particulate matter, the Ministry explained:—

"4 Advanced Measurement Stations (AMS) to study the effect of suspended particulate matter (turbidity/aerosol concentration) in the atmosphere *viz* dust particles, water vapour and gases etc. on scattering or absorption of solar irradiance have been installed at Chennai, Kolkata, New Delhi and Gandhi Nagar. Each AMS is providing a host of continuous information on aerosol column, atmospheric turbidity, column ozone, water vapour and NO_2 in the atmosphere. Ten independent narrow wavelength channels in the band 300 to 1020 nm (300, 325, 368, 500, 615, 675, 778, 870, 940 and 1020 nm) is continuously monitored for use in the UV spectrum analysis. Each wavelength has independent Collimator and Detector for simultaneous measurement of all wavelengths. Also each AMS measures the following parameters on the Reflectivity of the earth's surface (albedo), Incoming long wave radiation, Aerosol Optical Depth (AOD) of the atmosphere. The details of instruments used at each AMS are direct beam filter spectrometer with multiple filters, Pyrgeometer for measuring incoming terrestrial radiation, Scatterometer type visibility sensor for measuring ground visibility (meteorological optical range) to determine the amount of light scattered by smoke, dust, haze, fog, rain. Besides, C-WET also has completed on consultancy mode, installation of 4 more SRRA

stations for Maharashtra Energy Development Agency (MEDA), Government of Maharashtra.

SRRA is a very large-scale project involving measurement and collection of data from very sensitive and expensive sensors. A typical SRRA station consists of two towers of 1.5 m and 6 m tall each. The 1.5 m tall tower houses a solar tracker equipped with pyranometer, pyranometer with shading disc and pyrheliometer to measure global, diffuse and direct radiation respectively. The 6 m tall tower houses instruments measuring ambient temperature, relative humidity, atmospheric pressure, wind speed and direction, rain gauge and the data acquisition system. All the sensors are traceable to the World Meteorological Organization (WMO) and World Radiometric Reference (WRR) with high accuracy to ensure the good quality of recorded data. The Sun Tracker is configured using GPS system always to face the Sun. Each SRRA station is totally powered by SPV panels with seven day autonomy. The state of-the-art Data Acquisition System records 37 measured and derived parameters every second and transmit data after averaging it to one minute directly to Central Receiving Station (CRS) established at C-WET. In case of any failures in mobile connectivity, provision has been in-built to store six months data in memory chip, which can be retrieved as and when required. Fully automatic quality control procedure is implemented in the data processing, analysis and report generation. This includes flagging and gap filling method using quality check algorithms directly applying on the raw data. A dedicated Level 2 Server has been installed at C-WET for applying algorithms developed for data analysis and quality checks. For the values of Global Horizontal Irradiance (GHI), Direct Normal Irradiance (DNI) and Diffuse Horizontal Irradiance (DHI), applied quality control is based on Baseline Surface Radiation Network (BSRN) rules by the World Meteorological Organization (WMO), elaborated by the Management and Exploitation of Solar Resource Knowledge (MESOR). Besides, data on Pyrheliometer error (%), solar elevation and azimuth angles (deg), battery voltage and signals on sensor cleaning status are also received at the CRS, C-WET, Chennai. A trigger switch is also installed to track the cleaning status of the SRRA stations on a daily basis. Reports are generated on daily, monthly and yearly basis once the quality assessment is done. The collection and display of data is done by the software system specially designed, developed and implemented by the

service provider. Data can be monitored in CRS both in numerical and graphical format."

4.21 The Ministry also explained the Highlights of Solar Data Sharing and Accessibility Policy (SDSAP-2013) thus:—

"Data is monitored at an interval of one second and averaged over a period of 01 minute. One minute average data is transmitted through GPRS to a Central Receiving Station set up at C-WET, Chennai and associated facilities for data quality checks as per international norms and calibration facilities for various equipments/ sensors used at SRRA stations have also been set up.

1. C-WET is responsible for operation and maintenance of SRRA stations as per relevant national/international protocols. All data collected from these stations are received at Central Server located at C-WET, Chennai and data is processed for quality checks and is preserved safely.

2. C-WET in consultation with multiple locations both raw as well as processed data.

3. C-WET/SEC will sell the processed data upto 25 SRRA stations to a single buyer (both India and any foreign nationals/institutes/organizations) and the receipts will be credited in to SRRA Account maintained by C-WET. For selling more than 25 SRRA stations, specific permission from the Ministry should be obtained.

4. The buyers of the needs to sign a non disclosure agreement and shall be used only for their exclusive use and under no circumstances, the data, in full, part or in any other form, is to be disclosed/distributed/copied/reproduced/transferred to other agencies either electronically or in physical form.

5. MNRE will be the sole and exclusive owner of the data, both raw and processed received.

6. The details of solar policy and prices for each data type is available on C-WET website.

7. C-WET will make arrangements to provide data against payments as decided from time to time."

B. Wind Energy

4.22 According to Ministry's Report, Wind Energy has emerged as most successful renewable energy option in India and is the fastest growing renewable energy technology for generating grid connected power amongst various renewable energy sources. The Ministry's wind power programme covers survey and assessment of wind resources, facilitation of implementation of demonstration and private sector projects through various fiscal and promotional policies. A total capacity of 21132 MW has been established upto March, 2014 in the country. India is the fifth largest wind power producer in the world, after China, USA, Germany, and Spain.

4.23 When asked about the achievements *vis-a-vis* targets during the last three years, the Ministry furnished:—

Table 4.23

Year	Target (MW)	Achievement (MW)
2011-12	2400	3196
2012-13	2500	1700
2013-14	2500	2079

4.24 On a query regarding the fund utilization *vis-a-vis* allocation for the last three years, the Ministry furnished:—

Table 4.24

Year	Budget Allocation (Rs. in crores)	Utilization (Rs. in crore)
2011-12	28.00	27.51
2012-13	64.75	65.75
2013-14	314.50	314.39

4.25 Regarding physical target and financial allocation for the year 2014-15, the Committee are informed that a physical target of 3000 MW has been set with a budgetary allocation of Rs. 279 crore (including C-WET).

4.26 When queried about the major activities/Projects proposed to be undertaken by the Ministry during 2014-15, the Ministry in a note stated:—

- Wind Resource Assessment in new/untapped areas through C-WET and also through private sector

- Continuation of Generation Based Incentive scheme
- Constant follow-up with State Governments and Central Government regarding policy issues
- C-WET activities
- Establishment of a National Wind Energy Mission
- Finalization and announcement of policies for off-shore wind power development
- Work related with proposed Off-shore demonstration power project
- Reinstatement of Accelerated Depreciation benefit.

4.27 On a query regarding estimated wind potential in the country, the Ministry furnished:—

Table 4.27 State-wise Estimated Wind Potential

States/UTs	Estimated potential (MW) at 80m height*
1	2
Andaman and Nicobar	365
Andhra Pradesh	14497
Arunachal Pradesh	236
Assam	112
Bihar	144
Chhattisgarh	314
Dieu Daman	4
Gujarat	35071
Haryana	93
Himachal Pradesh	64
Jharkhand	91
Jammu and Kashmir	5685
Karnataka	13593
Kerala	837
Lakshadweep	16

1	2
Madhya Pradesh	2931
Maharashtra	5961
Manipur	56
Meghalaya	82
Nagaland	16
Odisha	1384
Puducherry	120
Rajasthan	5050
Sikkim	98
Tamil Nadu	14152
Uttarakhand	534
Uttar Pradesh	1260
West Bengal	22
Total	102788

* to be validated with field measurements.

4.28 When the Committee desired to know the steps taken to harness the estimated potential of wind energy in the country, the Ministry in a note replies:—

> "The Ministry has created conducive environment to achieve the available wind power potential in the country by introducing Investor-friendly policy framework and by offering fiscal and financial incentives. With increase in capacity addition of wind power, various issues have surfaced. Ministry is in process of establishing a National Wind Energy Mission (NWEM). By establishing a National Wind Energy Mission, the issues in wind sector will be taken up in a focused and structured way. A target of 15,000 MW has been fixed for the 12th Plan Period. With continuation of GBI scheme and reinstatement of AD benefit, it is expected that the targets of 12th Plan will be achieved."

4.29 Regarding continuation of Generation Based Incentive (GBI) and reinstatement of Accelerated Depreciation (AD) benefit in wind sector, the Ministry stated:—

> "The Generation Based Incentive (GBI) was continued on 04.09.2013 retrospectively *w.e.f.* 01.04.2012 for entire 12th Plan period with increased ceiling of Rs. 1.00 crore per MW instead of Rs. 62 lakh

per MW. The Finance Minister during budget discussions of current financial year has announced reinstatement of Accelerated Depreciation (AD) benefit in wind sector. Official notification is awaited."

4.30 Establishing a National Wind Energy Mission (NWEM) is one of the major projects being undertaken by the Ministry during 2014-15. When asked about the progress, targets and objectives of the Mission, the Ministry in a note stated:—

"Ministry has initiated action to establish a National Wind Energy Mission (NWEM). The Note for Expenditure Finance Committee (EFC) has been prepared and sent to Ministry of Finance in July 2014 for holding the EFC meeting. Their response is awaited.

The major objectives and targets of the NWEM are given below:—

(i) Creating necessary implementation framework for deployment of wind power, onshore, offshore and in off-grid mode through small wind energy systems, on a large scale.

(ii) Ensuring long term policy certainty to promote sustained investments in the sector.

(iii) Facilitating creation and availability of grid infrastructure for evacuation of power generated from wind.

(iv) Providing suitable incentives to promote investment in the wind energy sector.

(v) Enabling market certainty through a conducive off-take environment, that result in integration of large quanta of wind power into the system.

(vi) Ensuring coordination among states for aggressive off-take of wind power.

(vii) Facilitating dialogue and collaboration amongst all the stakeholders.

(viii) Providing assistance in research for new technologies and applications that hold promise of scale, scope, efficiency, and environmental and consumer benefits.

Table 4.30 : Phase-wise Targets

(Capacity in MW)

Wind power Category	Phase 1 (2014-17)	Phase 2 (2017-22)	Phase 3 (2022-27)	Total (2014-27)
Grid-connected On-shore Wind	11,000	25,000	30,000	66,000
Grid-connected Off-shore Wind	100	1900	7,000	9,000
Total Grid Connected (Onshore and Offshore)	11,100	26,900	37,000	75,000
Off-grid through Small Wind Energy Systems	2	5	8	15

4.31 When asked about the policy for private sector participation for the development of wind energy in the country, the Ministry stated:—

> "Wind power projects are mostly established in the country with private sector investments by offering fiscal and financial incentive. The private investors have to plan their projects at wind locations identified/vetted by C-WET with wind turbines empanelled with C-WET as per MNRE's scheme. They have to obtain NOC from concerned state department, get land clearance from concerned state department (in case of revenue or forest land), sign Power Purchase Agreement (PPA) with concerned utility for evacuation and transmission of power. For availing GBI, they have to register with IREDA, which is implementing the GBI scheme of MNRE."

4.32 On a query regarding provisions of fiscal and financial incentives provided by the Government in wind energy sector, the Ministry in a note stated:—

> "The Government is providing fiscal and promotional incentives such as concessional import duty on certain components of wind electric generators, excise duty exemption to manufacturers and exemption on Special Additional Duty (SAD). 10 years tax holiday on income generated from wind power projects is also available. Loans for installing windmills are available from Indian Renewable Energy Development Agency (IREDA) and other Financial Institutions. This apart, preferential tariff is being provided in potential states. The Ministry has announced a Generation Based Incentive (GBI) under which Rs. 0.50/unit generated from wind power projects is provided to the projects with a ceiling of Rs. 1.00 crore per MW. In the Budget Speech, Accelerated Depreciation has been announced for wind power which was withdrawn from 01.04.2012."

4.33 During its evidence meeting held on 23rd September, 2014, when the Committee queried about the assessment of wind resource taken up by the Ministry, the Ministry in a note furnished:—

"Ministry through the National Institute of Wind Energy (NTIWE) earlier C- WET have taken up Wind Resource Assessment activities in the country.

As on 31.09.2014, 793 dedicated Wind Monitoring Stations (WMS)/ Wind resource assessment stations have been commissioned and all these stations were distributed in 28 States and 3 Union Territories of the country. Commissioning and closure of wind monitoring stations has been a continuous process under the Wind Resource Assessment programme. Out of 793 Wind monitoring stations (WMS), 681 Nos. of WMS are closed down after the data collection and currently, 112 WMS are in operation as on 31.09.2014."

4.34 The State-wise details are given under table 4.34:—

Table 4.34

Sl.No.	State	Height-wise Number of Wind Monitoring Stations established as on 31.09.2014									
		18m	20m	25m	30m	45m	50m	80m	100m	120m	Total
1	2	3	4	5	6	7	8	9	10	11	12
1.	Andaman and Nicobar Islands	-	8	-	5	-	5	-	-	-	18
2.	Andhra Pradesh	-	18	42	-	-	5	15	10	-	90
3.	Arunachal Pradesh	1	-	6	-	-	2	-	-	-	9
4.	Assam	-	-	4	-	-	3	-	-	-	7
5.	Bihar	-	-	-	-	-	6	-	-	-	6
6.	Chhattisgarh	-	-	1 '	-	-	5	-	-	-	6
7.	Goa	-	-	-	-	-	4	-	-	-	4
8.	Gujarat	-	50	7	-	1	12	-	12	1	83
9.	Haryana	-	-	3	-	-	3	-	-	-	6
10.	Himachal Pradesh	-	-	5	-	-	1	-	-	-	6
11.	Jammu and Kashmir	-	-	3	-	-	21	-	-	-	24

1	2	3	4	5	6	7	8	9	10	11	12
12.	Jharkhand	-	-	-	-	-	3	-	-	-	3
13.	Karnataka	-	16	15	-	-	16	10	13	1	71
14.	Kerala	-	21	1	-	-	4	2	-	-	28
15.	Lakshadweep	-	7	-	-	-	1	-	-	-	8
16.	Madhya Pradesh	-	14	10	-	-	12	-	7	-	43
17.	Maharashtra	-	23	49	-	-	39	20	8	1	140
18.	Manipur	-	-	5	-	-	6	-	-	-	11
19.	Meghalaya	-	-	-	-	-	3	-	-	-	3
20.	Mizoram	-	-	4	-	-	1	-	-	-	5
21.	Nagaland	-	-	-	-	-	3	-	-	-	3
22.	Odisha	-	10	-	-	-	-	9	-	-	19
23.	Puducherry	-	-	4	-	-	-	1	-	-	5
24.	Punjab	-	-	8	-	-	2	-	-	-	10
25.	Rajas than	-	23	11	-	-	2	-	11	1	48
26.	Sikkim	-	-	4	-	-	-	-	-	-	4
27.	Tamil Nadu	-	35	23	1	-	11	3	13	1	87
28.	Tripura	-	-	3	-	-	2	-	-	-	5
29.	Uttar Pradesh-	-	-	-	-	-	11	3	-	-	14
30.	Uttarakhand	-	11	-	-	-	6	-	-	-	17
31.	West Bengal	-	-	9	-	-	1	-	-	-	10
	Grand Total	1	236	217	6	1	190	63	74*	5	793

* The 74 nos. of 100m level WMS that have been established so far, is inclusive of one offshore WMS at Dhanushkodi, Rameshwaram, Tamil Nadu. This 100m WMS was installed and commissioned at Dhanushkodi, Rameshwaram, Tamil Nadu on 30th September 2013 and currently data collection are in progress.

Further, during 2010, the Indian Wind Atlas was released and publicized by MNRE/NIWE (erstwhile C-WET). The Indian wind Atlas gives an updated overview of the wind climatological situations of India based on reliable measured wind data and using contemporary Numerical Mesoscale models. According to this Indian Wind Atlas, the estimated installable potential of country at 50 m level was estimated to be 49 GW. Further, NIWE/MNRE had carried out similar exercise at 80 m level with available MESO-Scale maps and estimated installable potential of Country was found to be 102 GW, which are to be validated.

4.35 The State-wise estimation of installable wind power potential at 50 m and 80 m level as furnished by the Ministry is given below:—

Table 4.35

States/UTs	Estimated potential (MW)	
	@ 50 m ($)	@ 80 m (* #$)
1	2	3
Andaman and Nicobar Islands	2	365
Andhra Pradesh	5394	14497
Arunachal Pradesh*	201	236
Assam*	53	112
Bihar	-	144
Chhattisgarh*	23	314
Dieu Daman	-	4
Gujarat	10609	35071
Haryana	-	93
Himachal Pradesh*	20	64
Jharkhand	-	91
Jammu and Kashmir*	5311	5685
Karnataka	8591	13593
Kerala	790	837
Lakshadweep	16	16
Madhya Pradesh	920	2931
Maharashtra	5439	5961
Manipur*	7	56
Meghalaya*	44	82
Nagaland*	3	16
Odisha	910	1384
Puducherry	-	120
Rajasthan	5005	5050
Sikkim*	98	98
Tamil Nadu	5374	14152

1	2	3
Uttarakhand*	161	534
Uttar Pradesh*	137	1260
West Bengal*	22	22
Total	49130	102788

* Wind potential has yet to be validated with actual measurements.

Estimation is based on meso scale modelling (Indian Wind Atlas).

$ As actual land assessment is not done on a conservative consideration 2% land availability for all States except Himalayan and North eastern States, Andaman Nicobar Islands and Poor windy States has been assumed. In other area 0.5% land availability has been assumed.

C. Small Hydro Power

4.36 Hydro Power Projects upto 25 MW capacity are classified as Small Hydro. Ministry of New and Renewable Energy has been vested with the responsibility of developing Small Hydro Power (SHP) projects in the country. The Ministry is implementing nation-wide programme named as "Small Hydro Power" programme to harness the power from potential sites, the estimated potential for power generation in the country for small/mini hydel projects is around 20,000 MW from 6474 identified sites all over the country.

4.37 When asked about the achievement *vis-a-vis* targets during the last three years, the Ministry furnished:—

Table 4.37

Year	Physical target (in MW)	Achievement
2011-12	300.00	352.68
2012-13	300.00	236.00
2013-14	300.00	171.42

4.38 On being queried about the reasons for the declining achievement during the last three years, the Committee were informed:—

> "The main reasons for fall in installed capacity during last two years has been natural calamity in Uttarakhand, restriction imposed by Hon'ble High Court on hydro projects in Uttarakhand and Karnataka, saturation of power purchase from small hydro projects in Himachal Pradesh, non-remunerative tariff for power generated from SHP projects, low rate of average pool power purchase rate in Himachal Pradesh and non-sale of Renewable Energy Certificates

in the open market. The private sector is no more finding setting up of small hydro projects as an attractive business. The costs of setting up projects are incrementally increasing and tariffs are not increased by the State Utilities. Hence new projects are not economically viable."

4.39 Regarding fund utilization *vis-a-vis* allocation, the Ministry furnished:—

Table 4.39

Year	Budget Estimate	Revised Estimate	Expenditure
2011-12	152.00	152.00	151.99
2012-13	139.00	159.00	158.93
2013-14	152.00	123.18	122.82

4.40 On being asked the physical targets and budgetary allocation for the year 2014-15, the Ministry stated that an allocation of Rs. 113 crore with physical target of 250 MW has been made for the SHP Programmed.

4.41 When asked the major activities/projects proposed by the Government during 2014-15, the Ministry in a note stated:—

"During the year, the Ministry has announced a revised scheme to support small hydro projects in the remaining period of the 12th Plan after approval of the Cabinet. Considering the advantage of small hydro projects, the Government, in its manifesto has promised to set up small hydro power generation projects to harness the hydro power. There has been sudden fall in the achievements of small hydro power in the first two years of the 12th Plan. During the year 2012-13, there has been a dip in the capacity addition and only 236 MW was added. Last year a capacity addition of only 171 MW was achieved. The situation is very similar this year as well. The Ministry proposes to ramp up small hydro activity in the country. Consultations are being held with State Governments and other stakeholders to explore the possibility and need for launching a National Mission on Small Hydro. The State Governments and private sector developers are of the opinion that taking up small hydro development in a mission mode would help the sector in regaining its pace.

The thrust of SHP programme during 2014-15 would be to identify bottlenecks and facilitate setting up of small hydro projects both in Government and private sector. The Mission document would be prepared and taken up for necessary approvals. The activity of development of 31 standards/manuals/guidelines for small hydro has been completed this year by AHEC, IIT Roorkee. Apart from support for new SHP projects, old projects would also be supported for their renovation and modernization. Ministry would continue its support for Identification of new potential sites and preparation of State SHP Plans. Strengthening of testing facilities and establishing a Center for Water Mills would be initiated."

4.42 When queried the objectives, targets, etc. of the National Mission on small hydro, the Ministry in a note stated:—

"The National Mission on Small hydro is still under conceptualization. The first step to draw the Mission is to identify bottlenecks in setting up of small hydro project both in Government and private sectors. Two consultation meetings have been held with all stake holders. The Ministry proposes to promote both run of the river and canal based projects. The aim would be that all States participate in the Mission. The States would be supported to develop a plan to harness the potential. Small size projects would be encouraged. The National Mission on small hydro is proposed to aim at harnessing at least 50% of SHP potential by the year 2019. This would require a capacity addition of 5000 MW in next 5 years."

4.43 On a query regarding assessment of SHP in the country, the Ministry stated:—

"As recommended by the Standing Committee on Energy in its 16th report, the Ministry had set up a working group on reassessment of small hydro potential under the Chairmanship of Adviser (SHP), MNRE and drawing members from the Central Electricity Authority, Ministry of Power, Central Water Commission and States like Karnataka, Himachal Pradesh, Uttarakhand, Arunachal Pradesh, Meghalaya. A series of meetings of the working group were held during 2012-13. Revised potential of small hydro in the country has been assessed at about 20,000 MW in place of 15,000 MW. This is based on the State-wise reassessed potential and the sites allotted by the States for SHP development by the private sector. As recommended by the working group, regular interactions are being held with the State Governments and the agency responsible for small hydro development in the State to identifying new potential sites."

4.44 Regarding the assessment of small hydro potential in the country as raised by the Committee during the evidence held on 23rd September, 2014, the Ministry in a note furnished:—

"The estimated Potential of SHP was accessed based on Potential identified by respective State Government Agencies as well as CEA. Further the estimated potential was re-assessed by AHEC, IIT Roorkee. The State Government/Agency allocate the site to the developers based on the potential identified by state Government, concerned. Each state has its own Policy on the allocation of SHP site as the SHP site allocation is generally the mandate of the State Government."

Table 4.44 : Potential, installed and under implementation (as on 30.09.2014)

Sl. No.	State	Potential		Projects Installed upto 31.03.2014		Projects Installed during 2014 (as on 30.09.2014)		Cumulative achievement till September, 2014	
		Nos.	Total Capacity (MW)	Nos.	Capacity (MW)	Nos.	Capacity (MW)	Nos.	Capacity (MW)
1	2	3	4	5	6	7	8	9	10
1.	Andhra Pradesh	387	978.40	68	221.030	0.000	0.000	68	221.030
2.	Arunachal Pradesh	677	1341.38	149	103.905	0.000	0.000	149	103.905
3.	Assam	119	238.69	6	34.110	0.000	0.000	6	34.110
4.	Bihar	93	223.05	29	70.700	0.000	0.000	29	70.700
5.	Chhattisgarh	200	1107.15	9	52.000	0.000	0.000	9	52.000
6.	Goa	6	6.50	1	0.050	0.000	0.000	1	0.050
7.	Gujarat	292	201.97	5	15.600	1.000	1.000	6	16.600
8.	Haryana	33	110.05	7	70.100	0.000	0.000	7	70.100
9.	Himachal Pradesh	531	2397.91	158	638.905	1.000	5.000	159	643.905
10.	Jammu and Kashmir	245	1430.67	37	147.530	0.000	0.000	37	147.530
11.	Jharkhand	103	208.95	6	4.050	0.000	0.000	6	4.050
12.	Karnataka	834	4141.12	147	1031.658	1.000	1.500	148	1033.158
13.	Kerala	245	704.10	25	158.420	1.000	3.000	26	161.420
14.	Madhya Pradesh	299	820.44	11	86.160	0.000	0.000	11	86.160
15.	Maharashtra	274	794.33	58	327.425	1.000	8.000	59	335.425

1	2	3	4	5	6	7	8	9	10
16.	Manipur	114	109.13	8	5.450	0.000	0.000	8	5.450
17.	Meghalaya	97	230.05	4	31.030	0.000	0.000	4	31.030
18.	Mizoram	72	168.90	18	36.470	0.000	0.000	18	36.470
19.	Nagaland	99	196.98	11	29.670	0.000	0.000	11	29.670
20.	Odisha	222	295.47	10	64.625	0.000	0.000	10	64.625
21.	Punjab	259	441.38	47	156.200	0.000	0.000	47	156.200
22.	Rajasthan	66	57.17	10	23.850	0.000	0.000	10	23.850
23.	Sikkim	88	266.64	17	52.110	0.000	0.000	17	52.110
24.	Tamil Nadu	197	659.51	21	123.050	0.000	0.000	21	123.050
25.	Tripura	13	46.86	3	16.010	0.000	0.000	3	16.010
26.	Uttar Pradesh	251	460.75	9	25.100	0.000	0.000	9	25.100
27.	Uttarakhand	448	1707.87	99	174.820	2.000	34.500	101	209.320
28.	West Bengal	203	396.11	23	98.400	0.000	0.000	23	98.400
29.	A&N Islands	7	7.91	1	5.250	0.000	0.000	1	5.250
	Total	6474	19749.44	997	3803.678	7.000	53.000	1004	3856.678

4.45 The Committee desired to know the policy available for private sector participation for the development of SHP in the country, the Ministry stated:—

> "A National Hydro Policy, which was announced by the Ministry of Power in 1998 and subsequently revised in November, 2008 includes small hydro projects. Further, electricity generation from renewable including small hydro are governed by Electricity Act 2003, National Electricity policy 2005 and Tariff policy 2006. As per Hydro Policy, hydro projects below 100 MW can be allotted through MOU route and only projects costing more than Rs. 2500 crore require CEA concurrence. This apart, CERC has issued guidelines for SERCs regarding tariff for power generated from renewable including small hydro. Keeping these provisions in view, 24 States have announced their policies to invite Private Sector to set up small hydro projects in their respective States. Water being State subject, the SHP projects is governed by the State policies and the potential sites are allotted by the State Governments to private developers as per their procedures."

4.46 When asked about the provisions of fiscal and financial incentives provided by the Government in SHP Sector, the Ministry furnished:—

> Among the fiscal incentives available to the SHP sector are 5 years holiday in income tax, concessional customs duty, and exemption

in electricity tax. The MNRE has been providing financial support for following activities to develop the SHP sector:—

- Research and Development, Capacity building.
- Resource Assessment, Detailed Survey and Investigation, DPR preparation.
- Capital Subsidy to State Sector Projects.
- Subsidy for Commercial Projects.
- Renovation and Modernization of old SHP projects (State Sector).
- Water Mills/Micro hydel projects.

Following subsidies are given by MNRE for SHP projects:—

1. Resource Assessment and Support for Identification of new sites:

Areas	Upto l MW	Above 1 MW and up to 25 MW
All States and UTs	Rs. 6,00,000 per Project	Rs. 10,00,000 per Project

2. Support to new SHP projects in State sector:

Category	Above 100 KW and up to 1000 KW	Above 1 MW-25 MW
Special category and NE States	Rs. 75,000 per KW.	Rs. 7.5 Crores/MW limited to Rs. 20 crore per project.
Other States	Rs. 35,000 per KW.	Rs. 3.5 Crores/MW limited to Rs. 20 crore per project.

3. Support to new SHP project in private/co-operative/joint sector:

Areas	Up to 25 MW
Special category and NE States	Rs. 1.5 crore/MW limited to Rs. 5.00 crore per project
Other States	Rs. 1.0 crore/MW limited to Rs. 5.00 crore

4. Scheme to support Renovation and Modernization of old SHP projects in public sector:

Areas	Upto 1000 KW	Above 1 MW and up to 25 MW
All States and UTs	Rs. 10,000 per KW	Rs. 1.00 crore/MW limited to Rs. 10.00 crores per project

5. Watermills:

Sl.No.	Category of Watermill	Amount
1.	Mechanical output only	Rs. 50,000/-per Watermill
2.	Electrical output (up to 5 kW) or, Both mechanical and electrical output (up to 5 kW)	Rs. 1,50,000/-per Watermill

6. Micro Hydel Projects up to 100 kW Capacity:

	Areas	Amount
	All States	Rs. 1,25,000/-per KW

CHAPTER V

RENEWABLE ENERGY FOR RURAL APPLICATIONS

The Ministry of New and Renewable Energy has been supporting Programmes for the deployment of renewable energy systems and devices such as biogas plants, photovoltaic systems, biomass gasifiers, solar cookers and solar thermal systems etc. for rural and semi-rural applications. The Ministry has also been implementing remote village electrification programme and village energy security test projects.

5.2 When asked the Budgetary Allocation (BE/RE) and actual utilization under Renewable Energy for Rural Applications for the last two years, the Ministry furnished:—

Table 5.2 : BE/RE and Actual Utilization for Rural Applications

(Rs. in crore)

Sl. No.	Programme/ System	2012-13			2013-14			2014-15
		B.E.	R.E.	Actual	B.E.	R.E.	Actual	B.E.
1.	Remote Village Electrification Programme (RVE)	0.00	0.00	0.00	15.00	15.00	15.00	14.00
2.	Cooking devices (Biogas, Improved Cookstoves and Solar Cookers)	175.00	124.00	116.51	135.00	98.29	94.21	143.50
	Total	175.00	124.00	116.51	150.00	113.29	109.21	157.50

5.3 On being asked about the physical achievements *vis-a-vis* targets during the last two years, the Ministry furnished:—

Table 5.3

S. No.	Programme/system	2012-13		2013-14		Target
		Target	Ach.	Target	Ach.	2014-15
1	2	3	4	5	6	7
1.	RVE (No. of Villages and Hemlets)		975		860	250 (Sanct-ioned)

1	2	3	4	5	6	7
2.	Biogas (No. of Biogas Plants in Lakh)	1.3	1.20	1.1	0.85	1.10
3.	Improved Cookstoves	New Programmes				7.50
4.	Solar Cookers (No.)	10,000	5,776	10,000	9,337	10,000

5.4 When queried about the achievements *vis-a-vis* targets under Remote Village Electrification, the Ministry stated:—

> "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 were not covered under Rajiv Gandhi Gramin Vidyutikaran Yojana programme. State wise targets were not set under the programme.
>
> The overall target of 10,000 villages and hamlets for the 11th Plan was fixed on the basis of approximate projection for the number of villages which were not likely to be covered through grid by the States. 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 required to be covered. Projects were sanctioned on case to case basis after proposals were submitted by the implementing Agencies as per the guidelines of the scheme. During the 11th Plan period, proposals for coverage of 7091 villages and hamlets (including 1058 border villages of Arunachal Pradesh) were received from various State Governments, which were sanctioned by the Ministry. In addition, 2824 villages and hamlets, which were sanctioned earlier, were ongoing. Thus all together, in the 11th Plan, 9915 villages and hamlets were sanctioned/ongoing. The Ministry on its part is making all out efforts to persuade the State Governments though continuous review meetings at various levels for timely completion of these villages and hamlets.

5.5 The State-wise details of achievements under Remote Village Electrification Programme as on 31st July, 2014 as furnished by the

Ministry is given below:—

Table 5.5 : State-wise achievements under RVEP

Sl. No.	State	Total Villages Sancti-oned	Villages Comp-leted	Ongoing villages	Total hamlets Sancti-oned	Hamlets comp-leted
1.	Arunachal Pradesh	297	297	0	1	0
2.	Andhra Pradesh	0	0	0	13	13
3.	Assam	2192	1953	65	0	0
4.	Chhattisgarh	682	568	0	0	0
5.	Gujarat	38	38	0	0	0
6.	Haryana	0	0	0	286	286
7.	Himachal Pradesh	21	21	0	1	0
8.	Jammu and Kashmir	476	334	36	283	15
9.	Jharkhand	720	700	0	0	0
10.	Karnataka	22	16	2	57	14
11.	Kerala	0	0	0	607	607
12.	Madhya Pradesh	623	577	17	0	0
13.	Maharashtra	353	340	0	0	0
14.	Manipur	237	237	0	3	3
15.	Meghalaya	163	149	0	0	0
16.	Mizoram	20	20	0	0	0
17.	Nagaland	11	11	0	0	0
18.	Odisha	1720	1600	16	23	14
19.	Rajasthan	340	292	24	90	90
20.	Sikkim	0	0	0	13	13
21.	Tamil Nadu	0	0	0	184	131
22.	Tripura	85	60	23	944	782
23.	Uttarakhand	671	476	142	147	118
24.	Uttar Pradesh	284	113	0	223	222
25.	West Bengal	1201	1177	24	9	2
26.	Goa	0	0	0	19	19
	Total	10156	8979	349	2903	2329

5.6 On being queried the reasons for not allocating budget for the year 2012-13 and also as to how the Ministry manages to cover 975 villages/ hamlets for electrification in the absence of financial allocation, the Ministry stated:—

> "Due to budgetary constraints and for continuity of the programme from 11th Plan to 12th Plan was done in January 2013. Therefore, no budget was allocated for the year 2012-13. In absence of financial allocation in 2012-13, physical achievements were attained through projects sanctioned in previous years. For the year 2013-14, financial allocation was Rs. 15 crores which was utilized to clear past liabilities and project for sanctioning 288 villages/hamlets. Physical achievements were attained through progress monitoring of works sanctioned in previous years."

5.7 The Committee were earlier informed that modifying the existing scheme of Remote Village Electrification Programme (RVEP), a new scheme of Rural Area Energy Access Programme (REAP) is being formulated, when queried about the progress of the proposed new scheme, the Committee were informed:—

> "The Expenditure Finance Committee (EFC) meeting was held on 12/08/2014 under the Chairmanship of Secretary (Expenditure), Ministry of Finance for appraising the scheme modified RVEP (Rural Area Energy Access Programme was renamed as Remote Village Electrification Programme (RVEP) Phase II). The EFC suggested that
>
> 1. The old Scheme "Remote Village Electrification Programme (RVEP)" may continue without any modification in the basic parameters. MNRE must ensure that no substantial changes having financial implications are made to the existing Scheme of RVEP.
>
> 2. Minor changes can be made by MNRE which requires no EFC approval as per the extant norm for continuation of ongoing Schemes from 11th Plan to 12th Plan as contained in OM of DoE dated April 23, 2012.
>
> 3. The existing Scheme may continue with the approved Plan outlay of Rs. 1000 crore as provided for in the 12th Plan.
>
> 4. If MNRE contemplates making major/substantial changes to the existing Scheme of RVEP, they may rethink their strategy

as a provider of renewable energy within the ambit of the flagship programme of the Government which was announced by the President in his address to the Parliament in June, 2014 to provide "by the time the nation completes 75 years of its independence, every family will have a pucca house with water connection, toilet facilities, 24x7 electricity supply and access ". MNRE may accordingly, if it deems fit, draw up a strategy to provide renewable energy to all the households to be covered by this programme within the broader ambit of housing for all by the year 2022.

5. MNRE may also prioritize and re-strategize its Schemes which may supplement or complement the major flagship programme of the Government like the proposed "Shyama Prasad Mukherjee Rurban Mission", "Swatchh Bharat Abhiyan", "One Hundred Smart Cities" etc.

6. The need for synergy between various Ministries, avoidance of duplication of efforts and optimal utilization of Government resources need not be stressed to ensure harmonious coordinated efforts between various ministries and to avoid wasteful duplication of efforts and unnecessary creation of multiple establishments. MNRE, therefore, progressively needs to integrate all its basket of Schemes within the relevant flagship programmes of the Government so that optimal utilization of resources can be achieved.

MNRE must focus on areas for the implementation of RVEP which, hitherto, has not been touched by these programmes and where the utilization of fossil fuels is the maximum. It may be stated that these programmes must result in substantial reduction in fossil fuels like Kerosene so that the overall subsidy burden of the Government commensurably gets reduced."

5.8 When asked the physical targets and financial allocation for 12th Five Year Plan as well as for the year 2014-15, the Ministry stated:—

"The existing scheme of Rural Village Electrification Programme will continue as RVEP Phase II during 12th Five Year Plan with approved plan outlay of Rs. 1000 crore.

During 2014-15 it is proposed to sanction 250 new villages/hamlets with an outlay of Rs. 14 crores."

CHAPTER VI

RENEWABLE ENERGY FOR URBAN, INDUSTRIAL AND COMMERCIAL APPLICATIONS

The MNRE has reported that they have been promoting the use of technologies for energy recovery from municipal, industrial and commercial wastes and solar energy, for meeting certain niche energy demands for urban, industrial and commercial sectors in the country. The programmes being implemented during the year include: (i) Energy Efficient Solar/Green Building Prograrnme; (ii) Energy Recovery from Urban, Industrial and Agricultural Wastes; and (iii) Bioenergy and Cogeneration in Industry.

6.2 When asked to furnish the financial utilization *vis-a-vis* allocation for the last two years, the Ministry furnished:—

Table 6.2

(Rs. in crore)

Sl. No.	Programme/system	2012-13			2013-14			2014-15
		B.E.	R.E.	Actual	B.E.	R.E.	Actual	B.E.
1	Solar Thermal Systems	Budget has been included under Solar off-grid programme						
2	Green Buildings, Solar Cities and related issues	12.00	5.50	5.17	12.00	3.10	3.10	10.00
3	Alternate Fuel for Surface Transport	10.00	10.00	10.00	7.00	7.00	6.90	4.00

6.3 On a query regarding physical achievements vis-a-vis utilization, the Ministry furnished:—

Table 6.3

Sl.No.	Programme/system	2012-13		2013-14		Target
		Target	Ach.	Target	Ach.	2014-15
1.	Solar Thermal Systems (million m^2 of collector area)	0.6	1.4	0.5	1.1	0.5
2.	Alternate Fuel for Surface Transport (No. of vehicles supported)		32,963		370	

6.4 On being queried the steps taken by the Ministry to achieve the targets, the Ministry stated:—

> "For promotion of Solar Thermal systems, main thrust will be on sectoral approach; sectors envisaged to be covered include Pharmaceutical/Dairy/Food processing/Automobile/Textiles etc. In case of the other programmes of Solar Cities/Green Buildings, focus will be on awareness creation/promotional activities, National level Workshops/Regional Seminars, Training and capacity building activities, etc. The outlay in case of BOVs programme is mainly to meet past liabilities of about Rs. 4 crore."

6.5 When asked to furnish the physical as well as financial achievements *vis-a-vis* targets under Urban Industrial Waste to Energy programme for the last two years, the Ministry furnished:—

Table 6.5 : Waste to Energy

Year	Physical (in MW)		Financial Progress (Rs. in crore)	
	Target	Achievement	BE/RE	Expenditure
2012-13	40	20.23	32.05/12.71	12.45
2013-14	30	27.65	33.00/10.00	9.99

Biomass (Non-bagasse) Cogeneration in Industries is as follows:

Year	Physical (in MW)		Financial Progress (Rs. in lakhs)	
	Target	Achievement	BE/RE	Achievement
2012-13	60	88.65	750/527	527
2013-14	60	60.67	550/1288	1288

6.6 The physical targets and financial allocation for 2014-15 under Urban, Industrial and Agricultural Wastes/Residues furnished by the Ministry is as under:—

Table 6.6

Programme	Physical in MW	Financial (Rs.in crore)
Waste to Energy	30	27.50
Biomass (Non-bagasse) Cogeneration in Industries	80	8.00

6.7 The fiscal and financial incentives under the Programme on Energy from Urban, Industrial and Agricultural wastes/Residues provided by the Government is given below:—

Capital Subsidy

Wastes/Processes/Technologies	Capital Subsidy
1. Power generation from Municipal Solid Waste	Rs. 2.00 crore/MW (Max. Rs. 10 crore/ project)
2. Power generation from biogas at Sewage Treatment Plant or through biomethanation of Urban and Agricultural Waste/residues including cattle dung or production of bio-CNG.	Rs. 2.00 crore/MW or bio-CNG from 12000 m^3 biogas/day (Max. Rs. 5 crore/ project)
3. Biogas generation from Urban, Industrial and Agricultural Wastes/ residues	Rs. 0.50 crore/MWeq. (12000 m^3biogas/ day with maximum of Rs. 5 cr./project)
4. Power Generation from Biogas (engine/gas turbine route) and production of bio-CNG for filling into gas cylinders	Rs. 1.00 crore/MW or bio-CNG from 12000 m^3 biogas(Max. Rs.5 crore/ project
5. Power Generation from Biogas, Solid Industrial, Agricultural Waste/ residues excluding bagasse through Boiler + Steam Turbine Configuration	Rs. 0.20 crore/MW (Max. Rs. 1 crore/ project)

Fiscal Incentives:- Concessional/Nil Custom and Excise Duties

6.8 During the evidence, the Committee raised the issue regarding status of Municipal solid waste to energy projects of the country. The Ministry in a note furnished:—

"2.1 The Ministry is implementing the Programme on Energy from Urban, Industrial and Agricultural Wastes/Residues. Under the programme five pilot projects on power generation from Municipal Solid Wastes are being taken up in accordance with the guidelines given by Hon'ble Supreme Court during the hearing on a PIL held in May, 2007 and the recommendations of the Expert Committee contained therein. The Supreme Court permitted "MNRE to go ahead for the time being with five pilot projects chosen by them keeping in view of the recommendations made by the Expert Committee and them take appropriate decision in the matter". Accordingly, five projects were taken up for implementation and the brief status of these projects is given below:

(i) 16 MWMSW-to-power project, Okhla, New Delhi

The project has already been commissioned and running successfully for last two and half years but the capital subsidy Rs. 10.00 crore could not be released to this project as Delhi Pollution Control Board (DPCC) has not extended the 'consent to operate' due to non-fulfilment of flue gas emission standards. The latest report on flue gas is satisfactory and DPCC may grant consent to operate after the reports are considered by the National Green Tribunal. The project is utilizing about 1800 MT/day Municipal Solid Waste and is generating about 16MW electricity since its commissioning in January 2012.

(ii) 12 MWMSW-to-powerproject at Ghazipur, Delhi

The project being set up by IL&FS at Ghazipur, Delhi is under installation and major equipment and machinery have reached the site. While the waste processing part has already been completed and is in operation, the power generation part is under installation. It is expected that the project will be commissioned by December, 2014 and will consume about 1300 MT/day Municipal Solid Waste.

(iii) 11 MW MSW-to-power project in Hyderabad

The project is under installation by M/s. RDF Power Projects Ltd., at Hyderabad. The implementation of the project has been delayed due to shortage of funds. The implementation work has now recommenced with IL&FS joining the original promoters. The major equipment and machinery have already reached the site and it is expected that the first phase of the project would be commissioned by December 2014, and second phase will be completed by March 2015.

(iv) 10 MW MSW based project at Pune

The first phase of the project (2.5 MW) has been completed. The Maharashtra electricity Regulatory Commission (MERC) has issued tariff order for signing of PPA with MSECDL. It is expected that the first phase of the project could be connected with the grid by November, 2014 and second phase would be completed by June, 2015.

(v) 8 MW MSW-to-power project at Bangalore

The project was sanctioned to M/s. SGRRL, Bangalore and the project could not be completed by the promoters due to paucity of funds and the sanction of project has been cancelled.

6.9 On further queried about action plan for Municipal Solid Waste to energy for small municipalities, the Ministry stated:—

"While MNRE continues to implement the limited programme aimed at completing the above pilot projects, as per the directions of the Prime Minister Office in continuation of the announcement in the budget speech during February 2013, the Municipal Solid Waste-to-Energy Programme is now to be implemented by the Ministry of Urban Development."

CHAPTER VII

RESEARCH, DESIGN AND DEVELOPMENT IN NEW AND RENEWABLE ENERGY

According to the MNRE, their Research and Development activities aim at resource assessment, technology development, demonstration and commercialization. The Ministry supports Research, Design, Development and Demonstration (RDD&D) to develop new and renewable energy technologies, processes, materials, components, sub-systems, products and services, standards and resource assessment so as to indigenously manufacture renewable energy devices and systems. The underlying purpose of RDD&D efforts is to make industry competitive and renewable energy generation supply self-sustainable/profitable and thereby contribute to increase share in total energy mix in the country.

7.2 When asked to furnish the budgetary allocation and the actual expenditure during the last three years, the Ministry furnished:

Table 7.2

(Rs. in crore)

Year	BE	RE	Expenditure
2011-12	93.00	111.53	109.92
2012-13	192.00	126.00	108.90
2013-14	158.00	148.50	136.97

7.3 On a query regarding the major programme/Research undertaken and achievements during the last three years, the Ministry stated:—

> "The major research projects taken up during the last three years include technology development for higher efficiency solar cells, solar thermal power generation, biomass gasification including development of specifications and standards of biomass energy systems, biofuels, demonstration of enriched biogas as a transport fuel for vehicular application, hydrogen energy storage and fuel cell. Technology demonstration projects on biogas generation, purification and bottling of enriched biogas for various applications have also been taken up."

7.4 When queried about the budgetary allocation for the year 2014-15, the Ministry stated:—

> "Total budget for Research Design and Development (RDD&D) during the current year 2014-15 is Rs.149.50 crore, which includes Rs. 95.0 crore for RDD&D, and the remaining budget is for MNRE Institutions, namely, National Institute of Solar Energy (NISE), Gurgaon, National Institute of Wind Energy, Chennai and National Institute of Renewable Energy, Kapurthala."

7.5 When the Committee desired to know the thrust area identified for R&D support under new and renewable energy sector for the year 2014-15, the Ministry informed:—

> "The emphasis of MNRE is to support RD&D efforts for faster development of technology for commercialisation. The important areas to RD&D include solar thermal technology, solar photovoltaic technology, biogas, biofuel, hydrogen and fuel cells. The policy and guidelines for support of RD&D is under revision."

7.6 The Committee during the evidence raised about the R&D activities carried out by the Ministry in renewable energy sector. The Ministry in a note stated:—

> "The MNRE has been supporting R&D for technology development and demonstration leading to commercialization. A comprehensive policy and guidelines for research, design, development, demonstration and manufacture for new and renewable energy sector is in place. It has provisions to support R&D for technology development and demonstration through various academic and research institutions including autonomous bodies and industry. It emphasizes to strengthen Core R&D Groups/Centres so as to take up advanced research involving other institutions. Financial assistance for the projects that involve partnership with industry/ civil society organizations is normally restricted to 50% of the project cost. However, from any proposal from academic institutions, government/non-profit research organizations and NGOs, ministry may provide upto 100% funding. The policy and guidelines provides for promoting Public Private Partnerships (PPPs) for rapid scaling of investments in high quality R&D in this field. The R&D efforts have led to design and development of solar water heating system, solar cookers, solar photovoltaic system, biogas plants, improved biomass cookstoves, gasifiers, biomass cogeneration, etc. In addition,

R&D efforts are going on to design, develop and demonstrate hydrogen and fuel cells for power generation and other uses."

7.7 The Committee also raised about fund utilization under R&D sector raised by the Committee during the evidence, the Ministry informed:—

"Against a budget of Rs. 500 crore which was allocated for R&D in new and renewable energy sector for the 11th Five Year Plan, a total of 169 R&D projects in the areas of solar energy, bio-energy and hydrogen and fuels cells with budget of Rs. 525 crore have been sanctioned ta the various R&D institutions, academic institutions, industries, etc during the llth Plan Five Year Period. Total funds of Rs. 239.56 crore were released during the 11th Plan Period for R&D projects.

The RD&D projects taken up during the 11th Plan Period gave impetus to strengthening R&D capacity of the R&D/academic institutions/industries to take up R&D projects for technology development with commercial potential in long term. The projects taken up include higher efficiency solar cells, MW scale solar thermal power generation, advance research in biomass energy including development of specifications and standards of biomass energy system, hydrogen energy storage and fuel cells development, etc. In the area of biogas generation, demonstration projects on purification, bottling and utilization for various applications including biogas based refrigeration were taken up. As follow up the launch of a National Biomass Cookstove Initiative (NBCI) in 2009, the MNRE strengthened three test facilities for testing of biomass cookstoves, and developed a revised standard and test protocols for biomass cookstoves in 2013 to maintain the quality of products.

The MNRE spent around Rs. 142.65 crore on RD&D programme during the last three years. The focus areas for financial assistance are solar energy, bio-fuels, biogas, hydrogen and fuel cells for research, design, development and demonstration. Mahindra and Mahindra Ltd., Tata Motors Ltd., Air Products, Green Hydro Creative and Kirloskar Oil Engineers Ltd. are the private sector companies that are participating in RDD&D projects in Hydrogen supported by MNRE with financial contribution from them."

7.8 On a query regarding recent technological advancement in new and renewable energy sector so as to make the installations economical and user friendly, the Ministry stated:

> "The RD&D efforts made in research laboratories and industries under the projects funded by MNRE have resulted into developing the capacity of research institutions/industries for pursuing research for taking up RD&D projects for developing prototype systems for performance evaluation and then for furthering research efforts for scaling up of the systems."

7.9 When the Committee desired to know if any study is undertaken about the viability of wind and solar hybrid projects, the Ministry in a note stated:

> "Ministry had carried out evaluation of the scheme on Small Wind Energy and Hybrid Systems (SWES) including the viability of wind and Solar and hybrid projects through an independent consultant [M/s. World Institute of Sustainable Energy (WISE), Pune] during 2012-13. The study was to evaluate the performance of the systems installed under the SWES scheme and to study the viability of wind and solar hybrid projects. Some of the major findings of the report revealed that wind solar hybrid projects which were surveyed are installed either by Government agencies or Trust/societies and reported functionality rate of almost 75% and further, their success rate was reported high specifically in the NE States in remote village electrification. The study has further estimated that there is a huge market potential of wind solar hybrid systems for different applications like rural electrification, pump energisation, communication towers and replacement ofdiesel based captive power plants."

PART II

OBSERVATIONS/RECOMMENDATIONS OF THE COMMITTEE

Twelfth Five Year Plan

The Committee find that the budget allocation of the Ministry for the 12th Plan period is Rs. 19,113 crore. It is far below than the amount demanded by the Ministry for the entire plan period which was Rs. 40,000 crore. With this amount a capacity addition target of 29800 MW was fixed for the 12th Plan period. However, the budgetary allocation for the first 3 years of the plan period has been done and it is not evenly distributed. The allocation was Rs. 1150 crore (RE) for the year 2012-13, Rs. 1738 crore (RE) for the year 2013-14 as against Rs. 2519 crore (BE) for the year 2014-15. The total allocation for the first three year is Rs. 5407 leaving Rs. 13706 to be utilized for the last 2 years of the plan subject to the full utilization of the amount earmarked for the current fiscal *i.e*. 2014-15. The Committee were informed that the allocation has been substantially lower than the requirement projected and this would affect the overall targets of the 12th Plan. **The Committee draw attention to the reduced financial allocation. The Committee would like to recommend that the Ministry revisit the physical and financial targets under various heads and evolve simple strategy with a view to see that the allocated funds for the 12th Plan period for the renewable energy sector gets sufficient thrust.**

2. The Committee note that in order to accelerate the pace of implementation of renewable energy programmes in the country, the Ministry are aiming towards engaging other Ministries and public sector undertaking to encourage them to take up renewable energy development projects through their budget. The Committee were informed that the Ministry of Railways have made certain budget provision for renewable energy including setting up of 75 MW wind projects and energizing 1000 level crossings with solar power. Statedly, Ministry of Railways propose to set up a Railway Energy Management Company to harness potential of solar and wind energy and seek financial support including viability gap funding from the National

Clean Energy Fund operated by the Ministry of Finance. The Ministry propose to achieving the maintain its overall targets for the 12th Plan in association with other Ministries and PSUs who have interest and commitment to renewable energy. The Committee appreciate the approach of the Ministry in encouraging other Ministries and PSUs to take up renewable energy development projects. The Committee are of the considered view that there is a large scope for the involvement of Ministries *viz*. Defence, Home, Rural/Urban Development and PSUs of the Government. **The Committee, therefore, would like to emphasize about the association with the Ministry of Power in this endeavor. In order that there is better planning and effective coordination between all Ministries/Departments, the Committee recommend formation of an expert group with a view to suggest measures for launching the renewable energy development projects on a large scale.**

Demands for Grants of MNRE for 2014-15

3. The Committee find that the budgetary allocation of Rs. l521 crore (BE) during the year 2013-14 was enhanced to Rs. 1737.67 crore at RE stage. This includes provision of Rs. 1313.16 crore from National Clean Energy Fund (NCEF). The Committee appreciate the Ministry's effort to get supplementary Demands for Grants at RE stage. The actual expenditure of Rs. 1619.03 crore during the year 2013-14 which is 93 per cent of the enhanced budget is also satisfactory. The Committee note that the Ministry has got a increase (Rs. 781.33 crore) in the Budget Estimate for the year 2014-15 (Gross Budgetary Support of Rs. 2519 crore) over the Revised Estimates of previous year (Gross Budgetary Support of Rs. 1737.67 crore). The Committee also note that the Ministry had sought a Gross Budgetary Support to the tune of Rs. 5449 crore in their annual plan. However, an amount of Rs. 1519 crore was allocated as BE 2014-15 by Planning Commission and Ministry of Finance in the Interim Budget which was increased to Rs. 2519 crore in the Regular Budget. The Committee were informed that the allocated BE of Rs. 2519 crore includes Rs. 1000 crore for the budget announcements essentially for solar energy programmes and to that effect, there was no increase in BE for the regular on-going programmes of the Ministry. As such, the physical targets for 2014-15 were fixed keeping in view the BE provided in the Interim Budget. Scrutiny of the information supplied by the MNRE reveals that the programme of the Ministry such as wind power and solar power have

suffered a setback due to shortage of funds thereby creating pending liabilities for future. The Committee were informed that the Ministry is formulating proposals for availing funding under National Clean Energy Fund (NCEF) to meet the physical targets. **Keeping in view the significance of renewable energy *vis-a-vis* conventional energy, the Committee recommend that the Ministry of New and Renewable Energy should pursue with the Ministry of Finance and get allocation of more funds so that the renewable energy programmes may not face a setback.**

Solar Energy

4. The Committee note that India is endowed with a vast solar energy potential where the daily average solar energy incident varies from 4-7 Kilowatt hour per square meter resulting in generating nearly 30-50 MWp per square kilometer. To exploit the vast available potential of solar energy, the Jawaharlal Nehru National Solar Mission was launched in 2010 which targets include deployment of (a) 20,000 MW of grid connected solar power (b) 2,000 MW of off-grid solar applications including 20 million solar lights by 2022. The Mission is being implemented in three phases. Phase-I has concluded in March, 2013 and the achievements of the target is satisfactory. The Committee find that against the phase-I target of 1100 MW capacity addition of grid connected solar power generation, a total capacity of 1684.43 MW has been commissioned and under off-grid solar applications, against a target of 200 MWp, 252.5 MWp off-grid solar photovoltaic system equivalent capacity has been installed. On the financial front, against the budgetary provision of Rs. 1808.58 crore, the actual expenditure is reported to be Rs. 1754.54 crore during the first phase of the programme. The Committee appreciate the overall Phase-I performance especially for exceeding the achievements *vis-a-vis* targets. Regarding Phase-II (2013-17) targets, the Committee are informed that a capacity addition of 9000 MW grid connected solar power and 800 MW capacity equivalent off-grid solar applications has been set. Against this, as on 1st September, 2014, 2743 MW grid connected solar power and 87.77 MW off-grid solar applications have been commissioned. The Committee note that the target period of JNNSM Phase-II is 2013-17 and the achievement so far under Phase-II is 2743 MW and 800 MW both Grid and Off-grid which are satisfactory. **The Committee, therefore, recommend that all out efforts be made to achieve the target set under Phase-II of 9000 MW grid**

connected and 800 MW off-grid solar applications and the Committee apprised.

5. The Committee note that under the JNNSM, the Ministry is pursuing several projects simultaneously with the time-frame running from 2-5 years this includes 1000 MW Grid-connected Solar PV Power Projects by Defence Establishments under Ministry of Defence and Para Military Forces; 1000 MW Grid Connected Solar PV Power Projects by Central Public Sector Undertakings (CPSUs); Setting up of Solar Parks and Ultra Mega Solar Power Parks (25 Nos. totalling 20,000 MW); 15,000 MW of Grid Connected Solar PV Projects under Bundling Mechanism with unallocated Conventional Power; 90 MW Grid connected Solar PV Power Project on Canal Top/Canal Banks; Projects allotted for 750 MW under the Grid Connected Solar PV Power Projects with Viability Gap Funding; Power Sale Agreement for 300 MW signed; 1,00,000 Solar Power Driven Agricultural pump sets under the ongoing scheme have been finalized; Grid Connected Rooftop Solar PV Systems totalling 255 MW is under implementation; proposal of a 1000 MW of Grid Connected Solar PV Power Projects with VGF pending with M/o Finance for approval by IMG for funding under NCEF; Sites identified for two Solar Thermal Power Pilot Projects of 50 MW each. The aggregate capacity of these proposed projects is about 30,000 MW which is more than the Mission target of 20,000 MW capacity grid connected solar power. The Committee also observe the determination of the Government to the development of solar power projects during the budget announcement. Now the Ministry has a task ahead to achieve the targets and fulfill the ambition of the Government in the development of solar power. **The Committee, therefore, recommend that expansion of solar activities in the country need a revisit as not only the Government offices but other public bodies need to go in far in a big way for switching over or greater use of solar energy.**

Wind Energy

6. The Committee note that Wind Energy has emerged as most successful renewable energy option in India and is the fastest growing renewable energy technology for generating grid connected power amongst various renewable energy sources. The Wind Power potential in the country at the height of 80 metre has been estimated to be more than 1,00,000 MW. Against this, a total capacity of 21,132 MW has been reportedly installed as on March, 2014. The Committee find the last

two years' performance very poor *i.e* in 2012-13 and 2013-14, against the targets of 2500 MW each, a wind capacity addition of 1700 MW and 2079 MW has been achieved with reportedly full utilization of budget. The withdrawal of Accelerated Depreciation Benefits and Generation Based Incentive scheme have been held responsible for the low achievement of the targets during this period. The Committee were informed that the Generation Based Incentive (GBI) has been continued with increased ceiling and the Accelerated Depreciation (AD) is being reinstated. The Committee hope this would accelerate the performance of the wind energy sector during the current as well as coming years. For the year 2014-15, the Committee were informed that a physical target of 3000 MW has been set with a budgetary allocation of Rs. 279. **The Committee, therefore, recommend that every effort should be made to achieve the target for the current year. The Ministry should also give due publicity for the incentives available to the industry.**

Small Hydro Power

7. The Committee find that the estimated potential for power generation in the country from small hydro projects (upto 25 MW capacity) is around 20,000 from 6474 identified sites all over the country. Against this estimated potential, a cumulative capacity of 3856.678 MW capacity has been installed as on September, 2014. The Committee find the performance during 2012-13 quite dismal, *i.e*. against the target of 300 MW, the achievement was 236 MW and the achievement during 2013-14 is not satisfatory *i.e* against the target of 300 MW, a capacity addition of only 171.42 MW has been installed which is 57 per cent of the target. However, the fund allocation during this period has been fully utilized. The reasons for the declining achievement during the last two years has been attributed to the natural calamity in Uttarakhand, restriction imposed by High Court on hydro projects, in Uttarakhand and Kamataka, saturation of power purchase from small hydro projects in Himachal Pradesh, the tariff for power generated from SHP projects, low rate of average pool power purchase rate in Himachal Pradesh and non-sale of Renewable Energy Certificates in the open market: The Committee were apprised that the private sector is not finding the setting up of small hydro projects as an attractive business as costs of setting up projects are incrementally increasing and the tariffs are not that attractive.

The Committee find a substantial reduction in the physical target for 2014-15 which is set at 250 MW capacity with a financial allocation of Rs. 113 crore. Taking note of the statement of the Ministry that the problem areas in the sector have been identified, the Committee recommend that corrective steps be taken to exploit the available potential of small hydro power. The Committee were informed that the Ministry is in the process of launching a National Mission on Small Hydro for which consultations are being held with State Governments and other stake holders. **The Committee believe this new project of the Ministry would revamp the small hydro activity in the country and, therefore, recommend that both the initiatives and monitoring may be strengthened in order to ensure that their efforts bear the desired results.**

Remote Village Electrification Programme

8. Under Remote Village Electrification Programme (RVEP), the Committee observe that during 2012-13 no budget was allocated. The Committee were informed that it was due to uncertainity about the continuity of the programme from 11th Plan to 12th Plan. The Committee were further apprised that the existing scheme of RVEP will be continued as Rural Village Electrification Programme Phase-II during 12th Five Year Plan with a financial outlay of Rs. 1000 crore. The financial outlay for 2014-15 is Rs. 14 crore with a physical target to sanction 250 new villages/hamlets. The Committee are aware that the RVEP is being implemented for providing basic lighting in those remote unelectrified villages and hamlets where grid extension is not found feasible. The Committee had earlier in fact, recommended for continuity of the programme in the 12th Five Year Plan as well. Hence, the approval for continuation of the existing RVEP as RVEP Phase-II is applaudable. **Keeping in view the significance of the programme for the remote and far flung areas and the objectives and purpose for which the programme is being extended, the Committee recommend the Ministry to make serious efforts so that the plans are implemented and the rural people reap the intended benefits.**

Renewable Energy for Urban, Industrial and Commercial Applications

9. The Committee note that the programmes implemented by the Ministry under Urban, Industral and Commercial Applications include Energy Efficient Solar/Green Building Programme, Energy Recovery from Urban, Industrial and Commercial Wastes and Biomass

and Cogeneration in industry. The Committee observe a drastic reduction of budget at RE stage in all the major programme of the sector. Under Green Building Solar Cities BE of Rs. 12 crore during 2012-13 and 2013-14 in each year has been reduced to Rs. 5 crore and Rs. 3.10 crore respectively. Similarly, under waste to energy programme, the BE of Rs. 32.05 crore in 2012-13 and Rs. 33 crore in 2013-14 has been reduced to Rs. 12.71 crore and Rs. 10 crore respectively. The physical achievement under Green Building Solar Cities was not provided and under waste to power, in 2012-13 against a target of 40 MW only 20.23 MW capacity could be achieved which is merely 50 per cent of the target. However, the physical achievement under biomass co-generation is commendable which is 88.65 MW against a target of 60 MW in 2012-13 and 60.67 MW against a target of 60 MW in 2013-14. The financial performance under biomass co-generation is also satisfactory. For the year 2014-15, a financial allocation of Rs. 27.50 crore has been allocated with a physical target of 30 MW under waste to energy and Rs. 8 crore for 80 MW under biomass co-generation. It has been informed that five pilot projects on energy recovery from Municipal Solid Wastes (MSW) are on-going. The Committee were also informed that the Municipal Solid Waste to Energy programme is now being implemented by the Ministry of Urban Development. The Committee are aware that the Ministry itself is not setting up the projects but is playing the role of a catalyst and accordingly the progress of the projects monitored. MNRE being the nodal Ministry for all matters relating to new and renewable energy, has a major role and responsibilities in the development of renewable energy in all aspects. **The Committee, therefore, recommend that the Ministry should play a proactive role in coordination with the Ministry of Urban Development, State Governments, Municipal Corporations and other concerned Departments so that more projects for recovery of waste to energy are implemented. Besides, they should also strengthen their monitoring system for timely completion of the on-going projects. They also feel that the concept of Green Building, which aims to increase use of renewable energy in buildings by using solar passive design, use of eco-friendly and less energy intensive building materials, integration of renewable energy and energy efficiency, need promotions.**

Research, Design, Demonstration and Development in New and Renewable Energy (RDD&D)

10. The Committee note that the underlying purpose of RDD&D efforts of the Ministry is to make industry competitive and renewable

energy generation supply self-sustainable/profitable and thereby contribute to increase its share in total energy mix in the country. On scrutiny of the last three years' performance of the Ministry, the Committee observe enhanced budgetary allocation at RE stage during the year 2011-12 *i.e* from Rs. 93 crore (BE) to Rs. 111.53 crore (RE) and the actual expenditure of Rs. 109.92 crore. However, in the years 2012-13 and 2013-14, BE of Rs. 192 crore and Rs. 158 crore were reduced to Rs. 126 crore and Rs. 148.50 crore respectively at RE stage and the Ministry could spent Rs. 108.90 crore and Rs. 136.97 crore only during these years. For the year 2014-15, an amount of Rs. 149.50 crore is allocated, which includes Rs. 95.0 crore for RDD&D, and the remaining budget is for MNRE Institutions, namely, National Institute of Solar Energy (NISE), Gurgaon, National Institute of Wind Energy, Chennai and National Institute of Renewable Energy, Kapurthala. Regarding the major research projects undertaken during the last three years, the Committee were informed that technology development for higher efficiency solar cells, solar thermal power generation, biomass gasification including development of specifications and standards of biomass energy systems, biofuels, demonstration of enriched biogas as transport fuel for vehicular application, hydrogen energy storage and fuel cell and technology demonstration projects on biogas generation, purification and bottling of enriched biogas for various applications have been taken up. For the year 2014-15, the emphasis is to support RD&D efforts for faster development of technology for commercialization. Important areas of RD&D include solar thermal technology, solar photovoltaic technology, biogas, biofuel, hydrogen and fuel cells. It is also informed that the policy and guidelines for support of RD&D is under revision. **The Committee desire that 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. The Committee also 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. The Committee urge the Ministry to focus on technological advancements and hence, recommend that indigenous research and development in the**

field of renewable energy should be given utmost priority to bring down the cost of renewable equipment substantially and improve their efficiency considerably to attract substantive investment.

NEW DELHI;
19 *December,* 2014
28 *Agrahayana,* 1936 *(Saka)*

DR. KIRIT SOMAIYA,
Chairman,
Standing Committee on Energy.

ANNEXURE I

(*Vide* Para No. 3.1 of the Report)

12th Plan—Programme-wise Physical Targets and Financial allocation

Sl.No.	Programme	Physical Target	Financial Outlay (Rs. in crore)
1	2	3	4
I.	Grid-intractive and Distributed Renewable		
(A)	Grid-interactive		
1.	Wind Power	15,000 MW	5,800
2.	Small Hydro Power	2,100 MW	750
3.	Solar Power	10,000 MW	2,000
4.	Biomass Power (Combustion Gasification and Bagasse Cogeneration)	2,200 MW	350
5.	Urban and Industrial Waste to Energy	300 MW	300
6.	Transmission Infrastructure		50
	Sub-total (A)	29,600 MW	9,250
(B)	Off-Grid/DRPS		
1.	Solar applications	1,000 MWeq	4,000
2.	Energy from Urban/Municipal/ Industrial Wastes	200 MW	75
3.	Non-Bagasse Cogeneration in Industry	2,000 MWeq	175
4.	Biomass Gasifiers	55 MWeq	60
5.	Bio-gas based energy	50 MWeq	40
6.	Micro hydel and Watermills	25 MW	40
7.	Aero-generators/Hybrid systems	10 MW	50
	Sub-Total (B)	3,340 MWeq	4,440
	I-Total (A) + (B)		13,690

1	2	3	4
II.	Renewable Energy for Rural Applications		
1.	RVE Programme/Energy Access Depends on proposal from the States		1000
2.	Family type biogas plants	5.75 lakh	650
3.	Other Biogas applications		10
4.	Cook Stove (lakh)	27.50 lakh	300
5.	Solar Cookers (lakh)		130
6.	Energy Plantations		25
	II-Total		2115
III.	Renewable Energy For Urban, Industrial and Commercial		
1.	Solar Thermal Systems	8 million sq m (including cooker)	600
2.	Green buildings		10
3.	Solar Cities/pilot/related activities		100
4.	Alternate fuel vehicles (lakh)		90
	III-Total		800
IV.	Research, Design and Development in Renewable Energy		
1.	Bio-Energy		
	Bio-fuel		40
	Biogas		20
	Biomass Gasification		5
	Waste-to-Energy		5
	Cookstoves		10
2.	Solar Energy		330
3.	Small Hydro Power		35
4.	New Technology		
	Hydrogen Energy and HEFC		80
	Fuel Cells		60
	Tidal Energy		15
	Geo Thermal		30
	Battery Operated Vehicles		10

1	2	3	4
5.	Solar Energy Centre (SEC)/NISE		120
6.	C-WET		100
7.	NIRE		50
	IV-Total		910
V.	Support Programmes		
1.	Information and Publicity programmes (incl. SADP)		145
2.	International Relations		20
3.	HRD and Training		120
4.	Monitoring and Evaluation		6
5.	Plan Secretariat (Administration)		120
6.	IREDA Equity		300
7.	Outstanding liabilities of 11th Plan RVE,VESP and other		30
8.	e-Governance		7
9.	Support to SNA		50
10.	Solar Energy Corporation		600
11.	National Renewable Energy/Bio Energy Corporation		150
	V-Total		1548
	Total		19,063
	Externally Aided Projects (EAPs)		50
	TOTAL		19,113

ANNEXURE II

(*Vide* Para No. 4.2 of the Report)

Statement showing the details of the Budget Estimates for the year 2014-15 *vis-a-vis* BE/RE of 2013-14 and Actuals of 2012-13

DEMAND NO. 69

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

(Rs. in crores)

Sl. No.	Group/Sub-Group/Sub-Sub-Group/ Scheme/Sub-Scheme/Programme/ Sub-Programme	Major Head	Actual 2012-2013			Budget 2013-2014			Revised 2013-2014			Budget 2014-2015		
			Plan	Non-Plan	Total	Plan	Non-Plan	Total	Plan	Non-Plan	Total	Plan	Non-Plan	Total
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		Revenue	1006.13	13.15	1019.28	1419.50	14.55	1434.05	325.02	13.44	338.46	846.00	15.39	861.39
		Capital	81.00	0.00	81.00	99.50	0.00	99.50	99.50	0.00	99.50	95.00	0.00	95.00
		Total	1087.13	13.15	1100.28	1519.00	14.55	1533.55	424.52	13.44	437.96	941.00	15.39	956.39
1.	Secretariat-Economic Services	3451	14.97	12.65	27.62	19.00	13.90	32.90	20.00	12.79	32.79	23.00	14.14	37.14
	New and Renewable Energy													
2.	Grid Interactive and Distributed Renewable Power													
2.01	Grid Interactive and Distributed Renewable Power	2810	874.54	0.00	874.54	910.00	0.00	910.00	1144.83	0.00	1144.83	1949.00	0.00	1949.00

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2.02	Less—Amount met from National Clean Energy Fund	2810	-125.78	0.00	-125.78	0.00	0.00	0.00	-1116.31	0.00	-1116.31	-1487.50	0.00	-1487.50
	Net		748.76	0.00	748.76	910.00	0.00	910.00	28.52	0.00	28.52	461.50	0.00	461.50
3.	Renewable Energy for Rural Applications	2810	95.53	0.00	95.53	92.90	0.00	92.90	84.72	0.00	84.72	97.50	0.00	97.50
		3601	21.00	0.00	21.00	25.00	0.00	25.00	19.03	0.00	19.03	35.00	.0.00	35.00
		Total	116.53	0.00	116.53	117.90	0.00	117.90	103.75	0.00	103.75	132.50	0.00	132.50
4.	Renewable Energy for Urban, Industrial and Commercial Applications	2810	15.17	0.00	15.17	21.00	0.00	21.00	10.10	0.00	10.10	14.00	0.00	14.00
5.	Research, Design and Development in Renewable Energy													
5.01	Research, Design and Development in Renewable Energy													
5.01.01	Research, Design and Development in Renewable Energy	2810	100.23	0.00	100.23	139.50	0.00	139.50	130.00	0.00	130.00	149.50	0.00	149.50
5.01.02	Less—Amount met from National Clean Energy Fund	2810	0.00	0.00	0.00	0.00	0.00	0.00	-35.70	0.00	-35.70	-90.50	0.00	-90.50
	Net		100.23	0.00	100.23	139.50	0.00	139.50	94.30	0.00	94.30	59.00	0.00	59.00
5.02	Research, Design and Development in Renewable Energy	4810	5.00	0.00	5.00	18.50	0.00	18.50	18.50	0.00	18.50	0.00	0.00	0.00
	Total—Research, Design and Development in Renewable Energy		105.23	0.00	105.23	158.00	0.00	158.00	112.80	0.00	112.80	59.00	0.00	59.00

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
6.	Supporting Programmes													
6.01	External Support (EAP)	2810	1.00	0.00	1.00	10.00	0.00	10.00	6.30	0.00	6.30	8.00	0.00	8.00
6.02	Domestic Support	2810	23.79	0.50	24.29	41.00	0.65	41.65	36.83	0.65	37.48	54.00	1.25	55.25
	Total—Supporting Programmes		24.79	0.50	25.29	51.00	0.65	51.65	43.13	0.65	43.78	62.00	1.25	63.25
7.	Other Expenditure	2810	3.35	0.00	3.35	9.00	0.00	9.00	3.00	0.00	3.00	0.00	0.00	0.00
		3601	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	3.35	0.00	3.35	9.00	0.00	9.00	3.00	0.00	3.00	0.00	0.00	0 00
8.	Investment in Public Enterprises													
8.01	Investment in Public Enterprises	4810	76.00	0.00	76.00	81.00	0.00	81.00	181.00	0.00	181.00	95.00	0.00	95.00
8.02	Less—Amount met from Clean Energy Fund	4810	0.00	0.00	0.00	0.00	0.00	0.00	-100.00	0.00	-100.00	0.00	0.00	0.00
	Net		76.00	0.00	76.00	81.00	0.00	81.00	81.00	0.00	81.00	95.00	0.00	95.00
	Total-New and Renewable Energy		1089.83	0.50	1090.33	1347.90	0.65	1348.55	382.30	0.65	382.95	824.00	1.25	825.25
9.	Lumpsum Provision for N.E. Region and Sikkim													
9.01	Lumpsum Provision for N.E. Region and Sikkim	2552	0.00	0.00	0.00	152.10	0.00	152.10	83.37	0.00	83.37	94.00	0.00	94.00
9.02	Less—Amount met from Clean Eergy Fund	2552	0.00	0.00	0.00	0.00	0.00	0.00	-61.15	0.00	-61.15	0.00	0.00	0.00
	Net		0.00	0.00	0.00	152.10	0.00	152.10	22.22	0.00	22.22	94.00	0.00	94.00
10.	Actual Recoveries	2810	-17.67	0.00	-17.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grand Total		1087.13	13.15	1100.28	1519.00	14.55	1533.55	424.52	13.44	437.96	941.00	15.39	956.39

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B.	Investment in Public Enterprises	Head of Develo-pment	Budget Support	IEBR	Total	Budget Support	IEBR	Total	Budget Support	IEBR	Total	Budget Support	IEBR	Total
9.01	Indian Renewable Energy Development Agency	12810	60.00	1894.36	1954.36	60.00	2394.00	2454.00	45.00	2966.23	3011.23	40.00	3000.00	3040.00
9.02	Solar Energy Corporation of India	12810	16.00	0.00	16.00	21.00	0.00	21.00	36.00	0.00	36.00	55.00	0.00	55.00
	Total		76.00	1894.36	1970.36	81.00	2394.00	2475.00	81.00	2966.23	3047.23	95.00	3000.00	3095.00
C.	PIan Outlay*													
1	New and Renewable Energy	12810	1088.58	1894.36	2982.94	1368.90	2394.00	3762.90	404.30	2966.23	3370.53	847.00	3000.00	3847.00
2	North Eastern Areas	22552	0.00	0.00	0.00	152.10	0.00	152.10	22.22	0.00	22.22	94.00	0.00	94.00
	Total		1088.58	1894.36	2982.94	1521.00	2394.00	3915.00	426.52	2966.23	3392.75	941.00	3000.00	3941.00
	Demand No. 104	12810	1.45	0.00	1.45	2.00	0.00	2.00	2.00	0.00	2.00	0.00	0.00	0.00
	Ending - SBE													
	Starting - Part B 1													

*Inclusive of works outlay in the Ministry of Urban Development.

		Head of Develo-pment	Year	Budgetary Support			IEBR				
				Equity	Loan	Total	IR	Bonds/ Deb.	ECB/ Sup.	Others	Total
1	2	3	4	5	6	7	8	9	10	11	12
B l.	Investment in Public Enterprises—Details of Budgetary Support and IEBR										
9.01	Indian Renewable Energy Development Agency	12810	Act 2012-13	60.00	0.00	60.00	1017.74	0.00	874.13	2.49	1894.36
			BE 2013-14	60.00	0.00	60.00	1048.45	480.00	815.55	50.00	2394.00
			RE 2013-14	45.00	0.00	45.00	746.98	1500.00	719.25	0.00	2966.23
			BE 2014-15	40.00	0.00	40.00	1200.00	1000.00	800.00	0.00	3000.00
9.02	Solar Energy Corporation of India	12810	Act 2012-13	16.00	0.00	16.00	0.00	0.00	0.00	0.00	0.00
			BE 2013-14	21.00	0.00	21.00	0.00	0.00	0.00	0.00	0.00
			RE 2013-14	36.00	0.00	36.00	0.00	0.00	0.00	0.00	0.00
			BE 2014-15	55.00	0.00	55.00	0.00	0.00	0.00	0.00	0.00
	Total		Act 2012-13	76.00	0.00	76.00	1017.74	0.00	874.13	2.49	1894.36

1	2	3	4	5	6	7	8	9	10	11	12
			BE 2013-14	81.00	0.00	81.00	1048.45	480.00	815.55	50.00	2394.00
			RE 2013-14	81.00	0.00	81.00	746.98	1500.00	719.25	0.00	2966.23
			BE 2014-15	95.00	0.00	95.00	1200.00	1000.00	800.00	0.00	3000.00
	Ending—Part Bl										

Sl. No.		Major Head	Actual 2012-2013			Budget 2013-2014			Revised 2013-2014			Budget 2014-2015		
			Revenue	Cap./ Loan	Total	Revenue	Cap./ Loan	Total	Revenue	Cap./ Loan	Total	Revenue	Cap./ Loan	Total
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
E.	State and UT Plan Schemes													
	No State/UT Plan Schemes in Demand No. 69													
	Ending - Part E (State and UT Plan Schemes)													

(Rs. in crores)

		Major	Actual 2012-2013			Budget 2013-2014			Revised 2013-2014			Budget 2014-2015		
		Head	Plan	Non-Plan	Total	Plan	Non-Plan	Total	Plan	Non-Plan	Total	Plan	Non-Plan	Total
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Starting—Part D (Major Head-wise Totals)													
		2552	0.00	0.00	0.00	152.10	0.00	152.10	22.22	0.00	22.22	94.00	0.00	94.00
		2810	970.16	0.50	970.66	1223.40	0.65	1224.05	263.77	0.65	264.42	694.00	1.25	695.25
		3451	14.97	12.65	27.62	19.00	13.90	32.90	20.00	12.79	32.79	23.00	14.14	37.14
		3601	21.00	0.00	21.00	25.00	0.00	25.00	19.03	0.00	19.03	35.00	0.00	35.00
		4810	81.00	0.00	81.00	99.50	0.00	99.50	99.50	0.00	99.50	95.00	0.00	95.00
	Total		1087.13	13.15	1100.28	1519.00	14.55	1533.55	424.52	13.44	437.96	941.00	15.39	956.39
	Ending - Part D (Major Head-wise Totals)													
	Starting - Part F (Recoveries)													
		2810	0.00	0.00	0.00	0.00	0.00	0.00	-1313.16	0.00	-1313.16	-1578.00	0.00	-1578.00
			0.00	0.00	0.00	0.00	0.00	0.00	-1313.16	0.00	-1313.16	-1578.00	0.00	-1578.00
	Ending - Part F (Recoveries)													
	Starting - Part G (Charged Expenditure)													

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	No Charged Expenditure in Demand No. 69													
	Ending - Part G (Charged Expenditure) Starting - Part H (Receipts)													
	No Receipts in Demand No. 69													
	Ending - Part H (Receipts)													
	Starting - Part I (Gross Expenditure)													
		2552	0.00	0.00	0.00	152.10	0.00	152.10	22.22	0.00	22.22	94.00	0.00	94.00
		2810	970.16	0.50	970.66	1223.40	0.65	1224.05	1576.93	0.65	1577.58	2272.00	1.25	2273.25
		3451	14.97	12.65	27.62	19.00	13.90	32.90	20.00	12.79	32.79	23.00	14.14	37.14
		3601	21.00	0.00	21.00	25.00	0.00	25.00	19.03	0.00	19.03	35.00	0.00	35.00
		4810	81.00	0.00	81.00	99.50	0.00	99.50	99.50	0.00	99.50	95.00	0.00	95.00
			1087.13	13.15	1100.28	1519.00	14.55	1533.55	1737.68	13.44	1751.12	2519.00	15.39	2534.39
	Ending - Part I (Gross Expenditure)													
	Starting - Part SP (Special Statements)													
	No Special Statements in Demand No. 69													
	Ending - Part SP (Special Statements)													

		Major Head	Actual 2012-2013			Budget 2013-2014			Revised 2013-2014			Budget 2014-2015		
			Plan	Non-Plan	Total	Plan	Non-Plan	Total	Plan	Non-Plan	Total	Plan	Non-Plan	Total
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	2014-2015 Demands For Grants													
	DEMAND No. 69													
	MINISTRY OF NEW AND RENEWABLE ENERGY													
I.	Estimates of the amount required in the year ending 31st March, 2015 to defray charges in respect of OF Ministry of NEW AND RENEWABLE ENERGY													
										Revenue	Capital	Total		
									Charged	0.00	0.00	0.00		
									Voted	2439.39	95.00	2534.39		
II.	The Heads under which this Grant will be accounted for on behalf of the MINISTRY OF NEW AND RENEWABLE ENERGY													
	REVENUE SECTION													
	Secretariat-Economic Services	3451				19.00	13.90	32.90	20.00	12.79	32.79	23.00	14.14	37.14
	North Eastern Areas	2552				152.10	0.00	152.10	22.22	0.00	22.22	94.00	0.00	94.00
	New and Renewable Energy	2810				1223.40	0.65	1224.05	1576.93	0.65	1577.58	2272.00	1.25	2273.25
	Grants-in-aid to State Governments	3601				25.00	0.00	25.00	19.03	0.00	19.03	35.00	0.00	35.00

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Total-Revenue Section					1419.50	14.55	1434.05	1638.18	13.44	1651.62	2424.00	15.39	2439.39
	CAPITAL SECTION													
	Capital Outlay on New and Renewable Energy	4810				99.50	0.00	99.50	99.50	0.00	99.50	95.00	0.00	95.00
	Total-Capital Section					99.50	0.00	99.50	99.50	0.00	99.50	95.00	0.00	95.00
	GRAND TOTAL					1519.00	14.55	1533.55	1737.68	13.44	1751.12	2519.00	15.39	2534.39
	Notes: The above estimates do not include the recoveries shown below which are adjusted in reduction of expenditure.													
	Revenue Section													
	New and Renewable Energy	2810				0.00	0.00	0.00	-1313.16	0.00	-1313.16	-1578.00	0.00	-1578.00
	The expenditure provisions, net of above recoveries, will be as under:													
	Revenue					1419.50	14.55	1434.05	325.02	13.44	338.46	846.00	15.39	861.39
	Capital					99.50	0.00	99.50	99.50	0.00	99.50	95.00	0.00	95.00
	Total					1519.00	14.55	1533.55	424.52	13.44	437.96	941.00	15.39	956.39

ANNEXURE III

MINUTES OF THE THIRD SITTING OF THE STANDING COMMITTEE ON ENERGY (2014-15) HELD ON 23RD SEPTEMBER, 2014 IN COMMITTEE ROOM 'G-074', PARLIAMENT LIBRARY BUILDING, NEW DELHI

The Committee met from 1100 hrs. to 1310 hrs.

PRESENT

Shri Rajiv Pratap Rudy— *Chairman*

MEMBERS

Lok Sabha

1. Shri Om Birla
2. Shri M. Chandrakasi
3. Shri Harish Dwivedi
4. Shri Saumitra Khan
5. Kunwar Sarvesh Kumar
6. Dr. Arun Kumar
7. Shri Jagdambika Pal
8. Shri Ravindra Kumar Pandey
9. Shrimati Krishna Raj
10. Shri M.B. Rajesh
11. Shri Gutha Sukender Reddy
12. Shri Devendra Singh *alias* Bhole Singh
13. Shri Malyadri Sriram
14. Shri Bhanu Pratap Singh Verma

15. Shri V.P. Singh Badnore
16. Shri Pyarimohan Mohapatra
17. Dr. K.P. Ramalingam
18. Shri Ananda Bhaskar Rapolu
19. Dr. Anil Kumar Sahani
20. Shri Mohammad Shafi
21. Shrimati Viplove Thakur

SECRETARIAT

1. Shri N.K. Pandey — *Director*
2. Shri Dhiraj Kumar — *Additional Director*
3. Smt. L.N. Haokip — *Under Secretary*

WITNESSES

Ministry of New and Renewable Energy

1.	Shri Upendra Tripathy	Secretary
2.	Shri Tarun Kapoor	Joint Secretary
3.	Shri J.B. Mohapatra	JS&FA
4.	Shri J.C. Sharma	Eco. Adv.
5.	Dr. N.P Singh	Scientist 'G' (JS Level)
6.	Dr. Praveen Saxena	Scientist 'G' (JS Level)
7.	Shri A. K. Dhussa	Scientist 'G' (JS Level)
8.	Dr. S.Gomathi Nayagam	DG (NIWE)
9.	Shri Rajendra Nimje	Managing Director (SECI)

2. At the outset, the Chairman welcomed the Members of the Committee and the representatives of the Ministry of New and Renewable Energy to the sitting of the Committee and made known to them the provisions of Directions 55(1) and 58 of the Directions by the Speaker.

3. After introducing themselves to the Committee, the representatives of the Ministry of New and Renewable Energy played a documentary covering the various programmes and projects of the Ministry. Thereafter, the Secretary, MNRE briefed the Committee on the

Demands for Grants (2014-15) and made a power point presentation in this regard.

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

(i) Contribution of renewable energy in the country's power sector;

(ii) Targets *vis-a-vis* achievements under various programmes during 2013-14;

(iii) Financial requirements and allocation for 2014-15 *vis-a-vis* physical targets;

(iv) Physical and financial achievement *vis-a-vis* targets of the first two years of the 12th Plan;

(v) Importance of various renewable energy—wind, solar, small hydro, waste to energy, biomass, biogas, tidal, etc.;

(vi) Research and Development Programmes in the renewable energy sector;

(vii) Initiatives regarding enactment of the proposed Renewable Energy Act; and

(viii) Assessment in the viability of solar energy and wind power *vis-a-vis* high cost of its installation.

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

6. The verbatim proceedings of the sitting of the Committee were kept on record.

The Committee then adjourned.

MINUTES OF THE EIGHTH SITTING OF THE STANDING COMMITTEE ON ENERGY (2014-15) HELD ON 17TH DECEMBER, 2014 IN COMMITTEE ROOM 'C', PARLIAMENT HOUSE ANNEXE, NEW DELHI

The Committee met from 1500 hrs. to 1700 hrs.

PRESENT

Shri Kirit Somaiya— *Chairman*

MEMBERS

Lok Sabha

2. Shri Om Birla
3. Shri M. Chandrakasi
4. Shri Harish Dwivedi
5. Shri Saumitra Khan
6. Shri Bhagat Singh Koshyari
7. Kunwar Sarvesh Kumar
8. Shri R.P. Marutharajaa
9. Shri Jagdambika Pal
10. Shri Ravindra Kumar Pandey
11. Shrimati Krishna Raj
12. Shri M.B. Rajesh
13. Shri Vinayak Bhaurao Raut
14. Shri Devendra Singh *alias* Bhole Singh
15. Shri Bhanu Pratap Singh Verma

16. Shri V.P. Singh Badnore
17. Shri Oscar Fernandes
18. Shri S. Muthukaruppan
19. Shri Ananda Bhaskar Rapolu
20. Dr. Anil Kumar Sahani
21. Shri Mohammad Shafi

SECRETARIAT

1. Shri N.K. Pandey — *Director*
2. Shri Arun K. Kaushik — *Additional Director*
3. Smt. L.N. Haokip — *Under Secretary*

2. At the outset, the Chairman welcomed the Members and briefly apprised them of the agenda for the sitting. The Committee then took up for consideration the following draft Reports:—

(i) 1st Report on Demands for Grants of the Ministry of Power for the year 2014-15.

(ii) 2nd Report on Demands for Grants of the Ministry of New and Renewable Energy for the year 2014-15.

(iii) 3rd Report on Action Taken by the Government on the recommendations contained in the 41st Report (15th Lok Sabha) on Implementation of Rajiv Gandhi Grameen Vidyutikaran Yojana.

3. After discussing the contents of the Reports in detail, the Committee adopted the afore-mentioned draft Reports without any change. The Committee also authorized the Chairman to finalise the above-mentioned Reports and present the same to both the Houses of Parliament in the current Session.

4. *** *** *** *** ***

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

6. *** *** *** *** ***

The Committee then adjourned.

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