27

STANDING COMMITTEE ON ENERGY

(2016-17)

SIXTEENTH LOK SABHA

MINISTRY OF NEW AND RENEWABLE ENERGY

DEMANDS FOR GRANTS
(2017-18)

TWENTY SEVENTH REPORT

LOK SABHA SECRETARIAT
NEW DELHI

March, 2017/Phalguna,1938 (Saka)

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CONTENTS

REPORT

PART –I

NARRATION ANALYSIS

COMPOSITION OF THE STANDING COMMITTEE ON ENERGY
(2016-17)

LOK SABHA

Dr. Virendra Kumar- Chairperson

1. Shri Sultan Ahmed
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5. Shri Harish Chandra *alias* Harish Dwivedi
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7. Shri Bhagat Singh Koshyari
8. Dr. Arun Kumar
9. Kunwar Sarvesh Kumar
10. Shri Malyadri Sriram
11. Shri R.P. Marutharajaa
12. Dr. Pritam Gopinath Munde
13. Shri Jagdambika Pal
14. Shri Ravindra Kumar Pandey
15. Shri M.B. Rajesh
16. Shri Vinayak Bhaurao Raut
17. Shri Gutha Sukhender Reddy
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20. Shri Bhanu Pratap Singh Verma

RAJYA SABHA

21. Shri T.K.S. Elangovan
22. Shri Oscar Fernandes
23. Shri Ram Jethmalani
24. Shri La. Ganesan
25. Shri Javed Ali Khan
26. Dr. Prabhakar Kore
27. Shri Shamsher Singh Manhas
28. Shri S.Muthukaruppan

29. Dr. Anil Kumar Sahani

30. Smt. Viplove Thakur

SECRETARIAT

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2.	Shri Sukhi chand Chaudhary	Joint Secretary
3.	Shri N.K. Pandey	Director
4.	Smt. L. Nemjalhing Haokip	Under Secretary
5.	Ms. Deepika	Executive Assistant

INTRODUCTION

I, the Chairperson, Standing Committee on Energy, having been authorized by the Committee to present the Report on their behalf, present this Twenty Seventh Report on 'Demands for Grants of the Ministry of New and Renewable Energy for the year 2017-18'.

2. The Committee took evidence of the representatives of the Ministry of New and Renewable Energy on 15th February, 2017. The Committee wish to express their thanks to the representatives of the Ministry for appearing before the Committee for evidence and furnishing the desired information in connection with examination of Demands for Grants (2017-18).

3. The Report was considered and adopted by the Committee at their sitting held on 2nd March, 2017.

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

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

NEW DELHI
March 09, 2017
Phalguna 18, 1938 (Saka)

DR. VIRENDRA KUMAR
Chairperson,
Standing Committee on Energy

REPORT

PART I
NARRATION ANALYSIS

CHAPTER I

INTRODUCTORY

1.1 Over the years, renewable energy sector in India has emerged as a significant player in the grid connected power generation capacity. It supports the government agenda of sustainable growth, while emerging as an integral part of the solution to meet the nation's energy needs and an essential player for energy access. It has been realized that renewable energy has to play a much deeper role in achieving energy security in the years ahead and be an integral part of the energy planning process.

1.2 The Government of India has up scaled the target of renewable power capacity to 175 GW which includes 100 GW from Solar, 60 GW from Wind, 10 GW from bio-power and 5 GW from small hydro power to be achieved by 2022. The Ministry is implementing a wide range of schemes with fiscal and financial support and conducive policies to achieve this target. Largest ever wind power capacity addition of 3423 MW, exceeding target by 43% and solar power capacity addition of 3,019 MW, exceeding target by 116% were made in 2015-16. For the first time the largest solar power projects capacity of 20,904 MW was tendered and 31,472 Solar Pumps were installed in 2015-16 which is higher than total number of pumps installed during the last 24 years.

1.3 The Ministry of New and Renewable Energy (MNRE) has taken several steps to fructify the Government's dream of clean energy. The largest renewable capacity expansion programme in the world is being taken up by India. The Government is aiming to increase the share of clean energy through massive thrust in renewables. The core drivers for development and deployment of new and renewable energy in India have been Energy Security, Electricity shortages, Energy Access, Climate change, etc.

1.4 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 sources. The broad aim of the Ministry is to develop and deploy new and renewable energy as a significant source in furtherance of the national aim of energy security and energy independence. The Ministry, accordingly, facilitate to develop, demonstrate and

commercialize technologies for harnessing new and renewable energy sources in close concert with corporate, scientific and technical institutions. It has been implementing 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 application; and develop alternate fuels and application for stationery, portable and transport uses apart from supporting research, design and development of new and renewable energy technologies, products and services through:

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

(ii) Identifying Research, Design and Development thrust areas and Facilitate work on the same;

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

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

(vii) Facilitating industry in becoming internationally competitive

(viii) Identifying 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 Deployment of a strategy for various indigenously developed and manufactured new and renewable energy products and services.

1.5 The major functions of the Ministry include the following:

(i) Putting in place suitable policy and regulatory framework at the national and State levels for growth of new and renewable energy sector.

(ii) Making available necessary fiscal and financial incentives to domestic industry, developers/ investors and users for development/ deployment of Grid interactive / Off-grid renewable power systems to supplement fossil fuels based electricity generation, Standalone RE systems/ devices and services to supplement energy needs of cooking, lighting & motive power in rural areas, RE systems and services for urban, industrial & commercial application.

(iii) Promoting Human Resource Development in the new and renewable energy sector.

(iv) Fostering international cooperation in new and renewable energy sector

(v) Information, Publicity, Public Awareness creation in the Renewable Energy (RE) sector.

(vi) Supporting related Research & Development (R&D) activities / projects taken up by institutions and industry.

(vii) Undertaking resource assessment and potential estimation studies for all new and renewable sources of energy.

CHAPTER II

12TH FIVE YEAR PLAN PERFORMANCE

2.1 The total gross budgetary support of the Ministry for the entire 12th Plan period was Rs.19113 crore. The details of the year-wise allocation (BE/RE) along with expenditure of the 12th Plan (upto 31.12.2016) is given at *Annexure I*.

2.2 Elaborating the financial performance of the 12th Plan, the Ministry stated that the financial achievement for the first 4 years of the 12th Plan period, i.e., from the year 2012-13 to 2015-16 were 96.24%, 93%, 99.34 % and 99.56% respectively and the shortfall during 2013-14 was mainly due to time taken in meeting procedural requirements for utilization of the amount released in the third batch of supplementary for IMG approved projects.

2.3 When asked about the physical achievement *vis-a-vis* targets during 12thPlan period, the Ministry furnished:

S. No.	Programme / system	2012-13 to 2015-16		2016-17	
		Target	Ach.	Target	Ach. (as on 31.12.2016)
GRID POWER (Capacities in MW)					
1	Wind Power	9400	9517.15	4000	1922.99
2	Small Hydro	1150	878.51	250	59.92
3	Bio power	1730	1975.32	410	108.5
4	Solar Power	4400	5847.07	12000	2249.81
	Total	**16680**	**17964.55**	**16660**	**4341.22**
OFF – GRID (Capacities in MWeq)					
5	Waste to Power	50	66.81	15	4.47
6	Biomass (Non-bag Cogen)	280	269.39	60	0
7	Biomass Gasifiers (Rural)	5.3	2.01	2	0
	(Industrial)	33	33.09	8	4.3
8	Aero-Gens/ Hybrid systems	2.5	0.93	1	0.38
9	SPV Systems	180	231.67	100	98.5
10	Water Mills (WMs) / Micro/mini-hydel plants	10	9.18	1 MW + 500 Water mills	0.10 MW + 100 Water mills
	Total	**560.8**	**613.08**	**187**	**107.75**

DECENTRALISED RENEWABLE ENERGY SYSTEMS AND OTHER PROGRAMMES					
11	Remote Village Electrification (Nos. of Villages+ Hamlets)		2148		
12	Family type Biogas Plants (No. in Lakh)	4.6	3.64	1	0.36

2.4 Regarding the major physical achievement during the 12th Plan period, the Ministry highlighted that physical achievement for the period 2012-13 to 2015-16 was 17964.55 MW as against the target of 16680 MW during the corresponding period. However, during the year 2016-17, the achievement as on December 31, 2016 was 4341.22 MW as against the total annual target of 16660 MW.

2.5 Detailing about the achievement *vis-a-vis* targets both physical and financial, the Secretary, MNRE during the evidence deposed before the Committee:

> "When the Twelfth Plan was sanctioned, our target for the first four years was 16.68 GW and the target for the entire period was 30 GW of additional capacity – solar, wind, biomass and small hydro. If I look at those targets, then in the first four years, our achievement was 17.96 GW. It means that in terms of our target, we achieved somewhat more than what our original target was. If we look at the entire five-year period, which includes this year 2016-17, then the target was 30 GW, if I refer to the original targets. Our outlay approved at that stage in 2012-13 was Rs.19000 crore against which we received Rs.13,461crore, and the year is yet to end; it is to end in March 2017, but we would exceed the achievement against the original target of 30 GW. That is something which I would like to bring to your notice that when Twelfth Plan was framed, what was given to us, although we did not receive the entire fund as per the approved outlay, by and large, we would achieve the earlier target of 30 GW of additional capacity from RE sources. But then, as you are aware, in June 2015, the Cabinet decided that "No, these targets are not ambitious enough. We could do much more in order to meet the needs of the climate change objective". So, this target was further revised. The target was revised to 175 GW of RE capacity, cumulative capacity, by 2022 and there was a year-wise break-up. If I take those targets and the take the revised targets for 2015-16 and then 2016-17, then our targets for the first three years would be the original target because that was changed only in June 2015, it would be around 37 GW against which we will do around 31 GW. There is some shortfall, particularly in solar to some extent because our target was suddenly revised from 1 to 2 GW every year to 12 GW. So, although we have prepared the schemes in the last one year, which we will explain in detail of what has been the strategy, but the operational part of it and its implementation has taken time. As you would see, the results have started showing. But it will show more after some time."

2.6 On a query about the action plan/strategy of the Ministry to achieve the shortfall in the target set (physical & financial) of the 12th Plan, the Ministry stated:

"In the year 2014-15, the National Solar Mission target of 20,000 upto the year 2022 was upwardly revised to 100,000 MW. In addition, targets for other renewable energy sources were also set. The Ministry geared up for the revised targets, and during last two years over 15000 MW renewable power capacity have been added. This growth is all time high. In view of the increased ambitions, Ministry has undertaken several initiatives that include GBI; subsidies; fiscal incentives; amendments in the Tariff Policy for creating a robust Renewable Purchase Obligation (RPO) compliance regime and introducing Renewable Generation Obligation (RGO); solar parks; development of power transmission network; infrastructure status for solar projects; making roof top solar a part of housing loan by banks/NHB; Repowering Policy for old Wind turbines etc."

2.7 When the Committee desired to know about the future plan of the Ministry as the 12th Plan come to an end, the Secretary, MNRE during the evidence deposed before the Committee:

*"*As you know, this 12th Plan is ending now. We have to plan now. There is no plan as such. But as per the directions of the Ministry of Finance, we would undertake review of all the schemes where we have started the work so that if there is some corrections needed, we will make those changes. If need be, some more schemes would be required. So, we will prepare a road map for the next three years. What will we do in the next three years in terms of target, in terms of support and in terms of schemes? We will expand solar power. You would have seen that the Hon. Finance Minister in his Budget speech also made a mention that we will make more solar parks. We sanctioned 34 solar parks with the capacity of 20 gigawatt. We intend to go to the Cabinet. We are going to the Cabinet very soon for 20 gigawatt more capacity of solar power. What we have seen is that one hindrance is land. If we can through State agencies accumulate this land, give him developed land and give him transmission connectively, developer would be very happy to come and then we will get better prices. On solar side, one initiative would be to expand solar power, get them implemented fast. There are some constraints in some States. But we will discuss with the States and get them implemented fast."

CHAPTER III

ANALYSIS OF DEMANDS FOR GRANTS OF MNRE FOR 2017-18

3.1 The MNRE presented Demand No. 67 to the Parliament for the financial year 2017-18 on 9th February, 2017. The Charged and Voted provisions made in the Revenue and the Capital Sections of the Budget are as under:

(Rs. in crore)

	Revenue Section	Capital	Total
Charged	---	---	---
Voted	10724.54	90.00	1081454

3.2 A statement showing the details of the Budget Estimates for the year 2017-18 *vis-à-vis* that of Budget Estimates/Revised Estimates (BE/RE) of 2016-17 and Actuals of 2015-16 is given at *Annexure-II*.

3.3 The Plan Outlay of the Ministry of New and Renewable Energy (MNRE) during the year 2016-17 and for the year 2017-18 as furnished by the Ministry are given below:

(A) Budgetary support from National Clean Energy Fund (NCEF) including IEBR:

(Rs. in crore)

Components of Plan Outlay of MNRE	2016 -17		2017-18
	BE	RE	BE
Budgetary Support from NCEF	5000.00	4307	5,341.70
IEBR	9192.83	12301.52	8243.73
Total	14192.83	16608.52	13585.43

(B) Budgetary Support (scheme component plus non-scheme component)

FY	Budget grant without NCEF	NCEF grant in Budget	Total grant in Budget
2016-17 (RE)	88.13	4,272.00	4,360.13
2017-18(BE)	131.14	5,341.70	5,472.84

3.4 On a query regarding the allocations sought by the Ministry of New and Renewable Energy for the year 2017-18 and the amount actually sanctioned by the Ministry of Finance, the Ministry stated: .

> "An allocation of Rs.5538.69 crore was sought for the year 2017-18. Rs.5472.84 crore have been sanctioned by Ministry of Finance (scheme component plus non-scheme component) for the year 2017-18."

3.5 When asked as to whether the allocation made for the year 2017-18 will be sufficient to meet the requirement of the physical targets, the Ministry stated:

> "The increase in budget for the year 2017-18 is marginal. Since the last two years the capacity addition targets are progressively increasing, thereby leading to increased liability including for GBI. Accordingly, additional funds will be required for achieving higher targets set up for renewable energy sector that will be sought at R.E. and Supplementary stage."

3.6 The Gross Budgetary Support and Internal and Extra Budgetary Resources (IEBR) with BE/RE and Actuals, for the last three years (year-wise) as furnished by the Ministry are given below.

(Rs. in Crore)

	2014-15			2015-16			2016-17		
	BE	RE	Actual Exp	BE	RE	Actual Exp	BE	RE	Actual Exp(as on 31.12.2016)
GBS+ NCEF*	2519.00	2519.00	2479.05	2787.67	4246.53	4229.45	5000.00	4307.00	2788.34
IEBR	3000.00	3346.58	3291.16	3373.06	5430.93	6112.69	9192.83	12301.52	5294.53
Total	5519.00	5865.58	5770.21	6160.73	9677.46	10342.14	14192.83	16608.52	8082.87
*Support from NCEF for regular schemes of the Ministry has been introduced from FY 2013-14									

3.7 When asked about the variations in the BE/RE and actual expenditure during last three years, the Ministry stated:

> "The variation in BE/RE of IEBR in 2014-15 is because at the time of BE; a) second line of credit was not signed with JICA, hence there was no estimation under JICA line of credit; b) there was no estimation for signing of the ADB-II loan; and c) due to signing of new line of credit, the drawl from AFD was estimated at RE level to meet the fund requirement.
> During 2015-16, the enhancement in RE was mainly due to new schemes/programmes announced in the Finance Minister's Budget Speech viz. Solar Park Scheme (Rs. 500 crore); solar pumps for irrigation and drinking water (400 crore); and solar projects on canal tops and banks (Rs.100 crore); and also allocation for the projects under Green Energy Corridor (Rs 300 crore). Variation in BE/RE of IEBR was due to substantial prepayment from the borrowers at the RE stage, and allocation of the bonds at RE stage. The additional fund has been deployed to meet excess disbursement requirement.

During 2016-17, MNRE was allowed to raise an additional Rs.4000.00 crore through IREDA for implementation of MNRE programmes. This led to increase in IEBR at RE stage. Reduction in RE of GBS would be compensated through this additional funding."

3.8 On being asked about the major heads which showed shortfall in utilization of funds earmarked for expenditure during the year 2016-17, the Ministry stated that as of 31st December 2016, over all expenditure was over 65% of RE and that they have been making concerted efforts for utilization of RE in full. The Head-wise expenditure (in percentage) furnished by the Ministry is as below:

Programme Head	Exp. as % of RE
Grid Interactive Renewable Power	68.10
Off-Grid/Distributed and Decentralised Renewable Power	55.65
Research, Development and International Co-operation	55.50
Autonomous Bodies	81.42
Total	64.74

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

FY	BE	RE	Actual exp.	Quarter			Cumulative
				1st	2nd	3rd	
2014-15	2519	2519	2502.49	14%	30%	25%	69%
2015-16	2787.67	4246.53	4229.45	25%	23%	15%	63%
2016-17*	5000	4307	2788.34 (as on 31.12.2016)	35%	19%	11%	65%

3.10 When enquired whether the quarterly expenditure during the last three years were as per the plan and norms, the Ministry replied:

"Quarterly expenditure is broadly in line with the Ministry of Finance norms. A periodical monitoring mechanism is already in place to ensure that phasing of expenditure is as per the norms prescribed by the Ministry of Finance."

3.11 On being queried about the renewable energy projects recommended for NCEF support, the Ministry in a note stated :

"Through Finance Bill 2010-11 a corpus called National Clean Energy Fund (NCEF) was created out of cess on coal produced / imported for financing and promoting clean energy initiatives, funding research in the area of clean energy or for any other purpose relating thereto. The coal cess was initially collected at Rs.50.00 per tonne of coal and now the coal cess has been increased to Rs.400

per tonne. Till date the Inter-Ministerial Group (IMG) for NCEF has recommended 55 projects in different renewable energy areas."

3.12 Year-wise details of project recommended in NCEF since 2010 as furnished by the Ministry:

(Rs. in Crore)

Year	Projects recommended by IMG to be financed from NCEF	No of Projects recommended by IMG
2010-2011	0.00	-
2011-2012	566.50	9
2012-2013	2715.11	6
2013-2014	1060.22	11
2014-15	12000.17	19
2015-16	18469.47	10
Total	34811.19	55

3.13 Details of Fund position in NCEF since 2010 as furnished by the Ministry is given below:

(Rs. in Crore)

Year	Coal Cess Collected	Amount transferred to NCEF	Amounts financed from NCEF for projects
2010-2011	1,066.46	0.00	0.00
2011-2012	2,579.55	1,066.46	220.75
2012-2013	3,053.19	1,500.00	246.43
2013-2014	3,471.98	1,650.00	1,218.78
2014-2015	5,393.46	4,700.00	2,087.99
2015-2016	12,675.60	5,123.09	5,234.80
2016-2017 (RE)	28,500.00	6,902.74	6,902.74
2017-2018 (BE)	29,700.00	8,703.00	-
Total	86,440.21	29,645.29	15,911.49

3.14 When asked out of the total investment requirement of the order of Rs.8 lakh crore for deployment of 175 GW by 2022, how much is expected to come from NCEF, the Ministry stated:

"For BE 2017-18, Rs.5341.70 crore have been provided for in the Budget from NCEF. It may be mentioned that by 2017-18 an amount of Rs.86440.21 crore would be collected as Coal cess, Rs.29,645.29 crore will be transferred to NCEF and the amount financed from NCEF for projects would be Rs.15911.49."

3.15 With the likely introduction of Goods and Services Tax(GST), continued availability of funds from NCEF has become uncertain. When the Committee desired to know as to how the Ministry would arrange for alternate funding mechanisms to support investment in the sector in such scenario, the Ministry in a note stated:

"The Department of Expenditure, Ministry of Finance has informed that in view of the implementation of GST, and likely decision that the Clean Environment Cess may be used to compensate those States that may have a revenue loss due to GST, the fund may not be available from NCEF to finance RE projects.

Further, various studies have revealed that with introduction of GST the delivered cost of renewable energy will increase. The Ministry is taking up the matter with the Ministry of Finance for excluding renewable from GST regime or keep it at bare minimum rate, so that it does not result in increase in the delivered cost of renewable energy."

3.16 During the evidence, when the Committee desired to know about the budgetary requirement and also the budgetary support received from the NCEF and its likely impact due to GST, the Secretary, MNRE deposed before the Committee:

"Our requirement is more. We will take it up at the supplementary stage. We also see some changes which have happened in the last few months, which also means some more implications. I will just highlight two or three major changes. One change is about NCEF which is accumulated by imposition of cess on coal. It is understood and we have been given to understand that after GST, no cesses will there and all cesses will be subsumed in GST. So far our Budget also has been supported by NCEF. Even what is reflected in the Budget also says that it has support from NCEF. If that happens, then we will have more constraint because in the past, several projects have been supported by NCEF. For example, the entire green energy corridor has been funded by NCEF. This is a challenge which might come next year or during next year which we will have to meet."

3.17. Elaborating the likely impact of the GST in the renewable energy sector, the Secretary, MNRE stated:

"What happened is that in the last so many years, in order to promote the sector, no custom duty was imposed on solar or wind project; no excise duty was there. Most of the States have imposed very minor 4 per cent to five per cent VAT. That is why, they were slightly cheap. We do not know as to what will happen if GST comes. We had a presentation. We have met with the GST Council. We pleaded with them that all these RE-rated projects should be zero rated. If you impose six per cent or 12 per cent GST on all equipment which is required for installation of solar or wind, then cost per unit might go up by 30 to 40 paise. Now, as it is, we have a huge gap between thermal and RE resources.

If there is further an impact of 30 paise or 40 paise, then either the liability of the Central Government will go up or States or consumers will have to bear much more. So, fund availability because of fiscal changes is also something which might impact us negatively next year or years to come."

3.18 Regarding the fund availability, the Secretary MNRE during the evidence explained before the Committee:

"If you look at our whole strategy for going up to 175 GW, primarily, it is coming from private investment. It comes to around Rs.4 crore to Rs.4.5 crore per megawatt of investment in wind and solar. It means for 150 GW which we have to do, we require Rs.5-6 lakh crore money in the system of which we would provide some money as support, which we are giving through Viability Gap Funding, or in case of wind, as generation based incentive, or any other scheme which we may have to prepare over the next five years to meet the target. But Rs.4-5 lakh crore has to be arranged by these developers from banks, financial institutions either domestic or international, at reasonable rates so that tariff does not go up. This is a challenge. Even from our side, if you look at what we have been doing in the last two years especially and what we propose to do over the next few years, we need to support this sector because power is expensive from RE resources even now, although there has been some improvement. There is some need to cover this gap. If power from coal is priced at Rs.3.5 and wind power costs Rs.4.5, States need some support so that this cost of Rs.4.5 comes to at least Rs.4, if not Rs.3.5 so that the impact on the customer is minimized. Otherwise, this will have to go as higher tariff. It means there is a huge burden on us in terms of financial support which we need to meet. If you look at our Budget, this year also, we were told that we should plan for Rs.5300 crore of BE, which we have done."

3.19 Highlighting the challenges being faced by the Ministry in the development of renewable energy sector, the Secretary, MNRE during the evidence stated:

"If we are looking at 100 GW of solar, every megawatt requires two hectares of land, it means five acres of land. So, for 100 GW or let us say 90 GW of additional, we require 1,80,000 hectares of land. Now, our plan is to go for larger plants of 250 MW or 500 MW, it means we require a very large chunk of land at one place. As you would see, in solar parks, although we sanctioned a large number of solar parks, in some parks, the progress has not been that quick because land availability has not been ensured so far. In many States, it has been ensured, but in some parks, that delay has taken. We see the land availability, particularly in certain States as a challenge which we have to meet."

3.20 Further emphasizing the challenges, the Secretary, MNRE stated:

"This sector was benefited by providing accelerated depreciation. So, up to 80 per cent of plant and machinery cost would be written off in the very first year. That means, a very huge tax saving benefit would be ending on 31st of March. The tax holiday is ending on 31st of March. We had made a request again to the Finance Ministry but it has not been acceded to. This was pre-announced in the previous Budget. But those changes have happened. That is why the developers who were getting this tax shield will not get this tax shield. That means we will build this cost into tariff."

CHAPTER IV

POWER FROM RENEWABLES: GRID INTERACTIVE AND OFF-GRID RENEWABLE POWER

4.1 According to the Ministry's report, their focus has been to promote the development and deployment of various technologies for increasing the capacity of grid interactive and off-grid renewable power. Towards this end, the Government has been offering a number of fiscal and financial incentives to investors to increase the penetration of renewable power in the energy and electricity mix of the country. India's renewable energy installed capacity has grown from 3.9 GW in 2003-04 to about 50 GW in December, 2016. Wind energy has been the predominant contributor to this growth. It also accounts for 28.70 GW or 57.4 percent of the installed capacity followed by solar power 9.01GW, small hydro power 4.33 GW and biomass power 7.85 GW.

4.2 An allocation of Rs.3715 crore for grid power and Rs.898 crore for off-grid has been made under the Grid Interactive Renewable and off-Grid/Distributed and Decentralized renewable power for the year 2017-18.

4.3 The physical target *vis-a-vis* financial allocation of the various programmes under Grid Interactive Renewable and off-Grid/Distributed and Decentralized Renewable Power for the year 2017-18, as furnished by the Ministry, are as follows:

(Rs. in crores)

Grid Interactive Renewable power	**BE**	**Physical Target**
Wind Power	400.00	4000 MW
Hydro power	121.50	100 MW
Bio Power	33.00	360 MW
Solar power	2661.00	10,000 MW
Green energy Corridors	500.00	350 c km
Off-Grid/Distributed and Decentralized Renewable power	**BE**	**Physical Target**
Wind Power	8.00	0.5 MW eq
Hydro power	13.00	150 MW eq and 25 water mills
Bio Power	43.00	82.5 MWe
Solar power	700.00	Solar PV -100 MWp and CST- 16 MW
Biogas Programme	134.00	1.1 Lakh biogas plants

4.4 When asked about the physical achievements *vis-a-vis* targets during the last three years under grid and off-grid power, the Ministry furnished:

S. No.	Programme / system	2012-13 to 2015-16		2016-17	
		Target	Ach.	Target	Ach. (as on 31.12.2016)
GRID POWER (Capacities in MW)					
1	Wind Power	9400	9517.15	4000	1922.99
2	Small Hydro	1150	878.51	250	59.92
3	Bio power	1730	1975.32	410	108.5
4	Solar Power	4400	5847.07	12000	2249.81
	Total	16680	17964.55	16660	4341.22
OFF – GRID (Capacities in MWeq)					
5	Waste to Power	50	66.81	15	4.47
6	Biomass (Non-bag Cogen)	280	269.39	60	0
7	Biomass Gasifiers (Rural)	5.3	2.01	2	0
	(Industrial)	33	33.09	8	4.3
8	Aero-Gens/ Hybrid systems	2.5	0.93	1	0.38
9	SPV Systems	180	231.67	100	98.5
10	Water Mills (WMs) / Micro/mini-hydel plants	10	9.18	1 MW + 500 Water mills	0.10 MW + 100 Water mills
	Total	560.8	613.08	187	107.75
DECENTRALISED RENEWABLE ENERGY SYSTEMS AND OTHER PROGRAMMES					
11	Remote Village Electrification (Nos. of Villages+ Hamlets)		2148		
12	Family type Biogas Plants (No. in Lakh)	4.6	3.64	1	0.36

4.5 On being queried about the financial utilization *vis-à-vis* allocation during the last three years under Grid-interactive and Off-Grid Renewable Power, the Ministry furnished:

Resource/ Sector	FY 2014-15			FY 2015-16			FY 2016-17		
	BE	RE	Exp.	BE	RE	Exp.	BE	RE	Exp. Upto 31.12.16
Grid-Interactive & Distributed Renewable Power	2018.00	1845.00	1844.65 (99.98%)	2410.00	3902.00	3896.87 (99.87%)	3519.00	3076.70	2095.14 (68.10)
RE for Rural Applications	157.50	153.50	148.64 (96.83%)	160.00	109.21	102.91 (94.23%)	983.00	858.8	477.95 (55.65)
RE for Urban, Industrial and Commercial Applications	14.00	14.00	12.43 (88.79%)	4.62	4.62	4.62 (100%)	-	-	-
RD&D in RE	149.50	128.00	127.45 (99.57%)	90.00	106.00	100.98 (95.26%)	445.00	336.50	186.75 (55.50%)
Supporting Programmes	180.00	378.50	369.32 (97.57%)	123.05	124.70	123.97 (98.09%)	53.00	35.00	28.5 (81.43%)
Total Gross Budgetary Support (GBS)	**2519.00**	**2519.00**	**2502.49** (99.34%)	**2787.67**	**4246.53**	**4229.45** (99.56%)	**5000.00**	**4307.00**	**2788.34 (64.74%)**

4.6 Explaining the challenges and concern in the wind and solar energy sectors, the Secretary, MNRE during the evidence stated before the Committee:

> "One concern that we mentioned last time also which is a very real concern is that the solar and wind power is infirm in nature. It fluctuates like anything in a minute. It poses a problem for the grid operator as to how to integrate this. So, they will have to make investments in capacities, in equipment to take care of this infirmness. If solar is available only for six hours, during those six hours we will have to keep certain plants shut down. That means another cost. That is a technical requirement. That will be there in any case because whenever you have RE resources, you need plants which will not operate during those six to eight hours and come up immediately after the sunset. These are the technical challenges which we have to meet in consultation with the Ministry of Power because this will impose a cost on the Ministry of Power or thermal plant."

4.7 Regarding biomass and small hydro sector, the Secretary, MNRE before the Committee deposed:

> "We will work very hard on biomass which requires more investments because costs have gone up and secondly small hydro. As we would present, in small hydro our subsidy levels were fixed long time ago, costs have increased. I think we need to revise to attract investment and also to achieve the potential which is around 21 GW. We have done around 4.3 GW so far. We have great potential. These are things which also do not have problems of RE. They run continuously, there is no infirmness. When they start, they run".

A. Wind Energy

4.8 According to the 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 options. The Ministry's wind power programme covers wind resources assessment, facilitation of implementation of demonstration and private sector projects through various fiscal and promotional policies. A total capacity of 28700.44 MW has been established up to December, 2016 in the country. India is the fourth largest wind power producer in the world after China, USA and Germany.

4.9 When asked about the State-wise wind power potential and installed capacity, the Ministry furnished the following information as assessed by National Institute of Wind Energy (NIWE) at 100 meter above ground level:

State	Cumulative installed capacity as on 31.01.2017 (MW)	wind power potential at 100 meter above ground level (MW)
Andhra Pradesh	2109.30	44229
Gujarat	4535.92	84431
Karnataka	3194.20	55857
Kerala	43.50	1700
Madhya Pradesh	2288.59	10484
Maharashtra	4666.03	45394
Rajasthan	4236.72	18770
Tamil Nadu	7694.33	33800
Telangana	98.70	4244
Others	4.30	3342
Total	28871.59	302251

4.10 On being asked about Wind power capacity addition targets and achievements for the last three years i.e. 2014-15, 2015-16 and 2016-17, the Ministry furnished:

Year	Wind power capacity addition in MW	
	Target	Achievements
2014-15	2000	2312
2015-16	2400	3423
2016-17	4000	2094 (till 31.01.2017)

4.11 On a query about the fund utilization *vis-à-vis* allocation for the last three years, the Ministry furnished:

Year	Funds for Wind GBI Scheme (Rs. in crore)	
	Budgetary allocation	Utilization
2014-15	566	566
2015-16	314	314
2016-17	365	365

4.12 Regarding physical target and financial allocation for the year 2017-18, the Committee were informed that a target of 4000 MW wind power capacity addition has been set for the year 2017-18 and corresponding budgetary allocation is Rs.400 crore.

4.13 When the Committee desired to know as to whether the allocation would be sufficient to meet the physical target set, the Ministry stated that the allocation will not be sufficient to meet the ser target and they will be seeking additional budget allocation through supplementary grants & RE.

4.14 On being asked about the major activities/projects proposed to be undertaken by the Ministry during 2017-18, the Ministry stated :

> "So far the procurement of wind power in country is through Feed-in-Tariff. To bring competition in the sector bidding has been introduced in the sector. During 2017-18 efforts will be made to streamline the bidding process in the sector at both Central and State level."

4.15 When asked about the provisions of fiscal and financial incentives provided by the Government in the wind energy sector, the Ministry, in a note, stated:

> "At present, Government is promoting wind power projects through private sector investment by providing fiscal and financial incentives such as Accelerated Depreciation benefit; concessional custom duty, special additional duty and excise duty exemption on certain components of wind electric generators; 10 years tax holiday on income generated from wind power projects; etc. In addition, Generation Based Incentive (GBI) Scheme is available for the projects not availing Accelerated Depreciation benefit, under which Rs.0.50/unit is being provided to eligible wind power generators, with a ceiling of Rs.1.00 crore per MW."

4.16 When the Committee desired to know the provisions under Generation Based Incentive (GBI) benefit to wind energy developers/investors. the Ministry in a note stated:

> "The Generation Based Incentives (GBI) Scheme for grid interactive wind power is operative for the entire 12thPlan period. Under the scheme a GBI of Rs.0.50 per kWh of wind power generated with a ceiling of Rs.1.0 crore per MW is being

provided to wind power generators. The incentive can be availed in not less than 4 years and in maximum of 10 years with an annual ceiling of Rs.25 lakh per MW in first 4 years. Indian Renewable Energy Development Agency (IREDA) has been designated as the implementing agency for the Scheme.

The GBI scheme is being implemented in parallel with existing fiscal incentive including that of accelerated depreciation, for grid connected wind power projects in a mutually exclusive manner, so that companies can avail either accelerated depreciation or GBI, but not both.

The GBI will cover grid connected generation from wind power projects set up for sale of electricity to grid at a tariff fixed by SERC and/or State Govt. and also include captive wind power projects, but exclude third party sale, (viz. merchant power plants)."

4.17 About the implementation of the GBI Scheme and status regarding reinstatement of the Accelerated Depreciation(AD) benefit to wind energy developers/investors, the Ministry stated:

"The GBI Scheme is implemented through IREDA. The wind power producers are required to register with IREDA and required to furnish documentary proof to this effect that no accelerated depreciation has been availed. IREDA to disburse the GBI to the developers through their designated bank account periodically through e-payment. The AD was reinstated for wind sector in July 2014."

4.18. On being queried about the progress with regard to National Wind Energy Mission (NWEM), the Ministry stated:

"The draft National Wind Energy Mission document was prepared and circulated to concerned Ministries/Departments/Organizations and NITI Aayog for comments. Based on the comments received the Mission document was revised and the same in the process for approval."

B. Solar Energy

4.19 According to the MNRE's Report, India is endowed with a very vast solar energy potential. Most parts of the country have about 300 sunny days. Average solar radiation incident over the land is in the range of 4-7 kWh per day. The solar energy can be utilized through solar photovoltaic technology which enables direct conversion of sunlight into energy and solar thermal technologies which utilizes heat content of solar energy into useful applications. Over the last three decades several solar energy based systems and devices have been developed and deployed in India which are successfully providing energy solutions for lighting, cooking, water heating, air heating, drawing and electricity generation. The research and development efforts have also helped in better efficiency, affordability and quality of the products. As a result many

solar energy systems and devices are commercially available with affordable cost in the market

4.20 When the Committee asked about the estimated potential and the installed capacity of solar energy, the Ministry have stated that based upon the availability of land and solar radiation, the potential of solar energy in the country has been assessed to be around 750 GWp. The state-wise details of estimated potential and the cumulative installed capacity (as on 31.12.2016) as furnished by the Ministry are given as follows:

Sl. No.	State	Solar Power Potential (MWp)	Installed Capacity (MW) as on 31.12.2016
1.	Andhra Pradesh	38440	979.65
2.	Arunachal Pradesh	8650	0.27
3.	Assam	13760	11.18
4.	Bihar	11200	95.91
5.	Chhattisgarh	18270	135.19
6.	Delhi	2050	38.78
7.	Goa	880	0.05
8.	Gujarat	35770	1158.50
9.	Haryana	4560	53.27
10.	Himachal Pradesh	33840	0.33
11.	Jammu & Kashmir	111050	1.00
12.	Jharkhand	18180	17.51
13.	Karnataka	24700	327.53
14.	Kerala	6110	15.86
15.	Madhya Pradesh	61660	840.35
16.	Maharashtra	64320	430.46
17.	Manipur	10630	0.01
18.	Meghalaya	5860	0.01
19.	Mizoram	9090	0.10
20.	Nagaland	7290	0.50
21.	Odisha	25780	77.64
22.	Punjab	2810	545.43
23.	Rajasthan	142310	1317.64
24.	Sikkim	4940	0.01
25.	Tamil Nadu	17670	1590.97
26.	Telangana	20410	973.41
27.	Tripura	2080	5.02
28.	Uttar Pradesh	22830	239.26
29.	Uttarakhand	16800	45.10
30.	West Bengal	6260	23.07
31.	UTs	790	21.58
32.	Others/Ministry/ Railways/ PSUs	-	61.70
	Total	748980	9012.69

4.21 On being asked the action plan of the Ministry to harness the vast available potential of solar energy, the Ministry stated:

> "The Government of India has revised the National Solar Mission target of Grid Connected Solar Power projects from 20,000 MW by 2022 to 100,000 MW by 2022. The Government has planned to achieve the target of 1,00,000 MW by setting up Distributed Rooftop Solar Projects and Medium & Large Scale Solar Projects."

4.22 The break-up of the projects for capacity addition of 100,000 MW solar power by 2022 as furnished by the Ministry is as under:

Category-I	Proposed Capacity (MW)	Category-II	Proposed Capacity (MW)
Rooftop Solar	40,000	Scheme for Decentralized Generation of Solar Energy Projects by Unemployed Youths and Farmers	10000
		Public Sector Undertakings	10,000
		Large Private Sector/IPPs	5,000
		SECI	5,000
		Under State Policies	20,000
		Ongoing programmes including past achievements	10,000
Total	40,000		60,000

4.23 The Year-wise capacity addition envisaged under the two categories as furnished by the Ministry :

Category	Year-wise Targets(in MW)							
	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Rooftop Solar	200	4,800	5,000	6,000	7,000	8,000	9,000	40,000
Large Scale Solar Power Projects	1,800	7,200	10,000	10,000	10,000	9,500	8,500	57,000
Total	2,000	12,000	15,000	16,000	17,000	17,500	17,500	97,000 *

*3,743 MW commissioned upto 2014-15.

4.24 On being queried about the steps taken to achieve the ambitious target of 1,00,000 MW solar power by the year 2022, the Ministry in a note have stated that they have started the following schemes under JNNSM for implementation in the current and next 5 years:

- Solar Park Scheme for setting up of over 25 Solar Parks and Ultra Mega Solar Power Projects targeting over 20,000 MW of solar power projects.

- Scheme for setting up 1000 MW of Grid-Connected Solar PV Power Projects by Central Public Sector Undertakings (CPSUs) and Government of India organizations with VGF.

- Scheme for setting up 300 MW of Grid-Connected Solar PV Power Projects by Defence Establishments and Para Military Forces with VGF.

- Pilot-cum-demonstration project for development of grid connected solar PV power plants on canal banks and canal tops.

- Bundling Scheme - 15000 MW grid-connected solar PV power plants through NTPC Ltd./ NVVN

- VGF Scheme for setting up of 2000 MW of Grid Connected Solar PV Power Projects through SECI

- VGF Scheme for setting up of 5000 MW of Grid Connected Solar PV Power Projects through SECI

- Installation of Grid Connected Solar Rooftop Power Plants

4.25 Elaborating the steps taken to achieve the target of 1,00,000 MW solar power by 2022, the Ministry further stated:

> "The Government is promoting solar energy through fiscal and promotional incentives such as capital and/or interest subsidy, tax holiday on the earnings for 10 years, generation based incentive, accelerated depreciation, viability gap funding (VGF), financing solar rooftop systems as part of home loan, concessional excise and custom duties, preferential tariff for power generation from renewables, and Foreign direct investment up to 100 per cent under the automatic route etc.
> This apart, the Government has been supporting solar manufacturing by way of various mechanisms such as Modified Special Incentive Package Scheme (M-SIPS) of Ministry of Electronics & Information Technology (MeitY)."

4.26 On being asked about the steps taken or proposed to be taken regarding assessment of availability of Roof-Tops for generation of Solar Energy, the Ministry stated:

> "According to a study conducted by 'The Energy and Resource Institute (TERI)', potential of about 124 GW has been estimated in the country for rooftop installations. National Institute of Solar Energy (NISE) has also estimated a potential of 42.8GW rooftop solar rooftop in the country. The target has been set for commercial/industrial (20GW), Govt. (5 GW), Residential, institutional and Social Sector (15 GW)."

4.27 When the Committee desired to know about the achievement of Grid connected solar capacity addition, the Ministry furnished :

Sl. No	Year	Target	Capacity added during year (MW)	Cumulative capacity (MW)
1	Upto 2010	No year-wise targets were set (target for phase –I (2010-2013) was 1100 MW.	--	11 MW
2	2010-11		25 MW	36 MW
3	2011-12		994 MW	1030 MW
4	2012-13		656 MW	1686 MW
5	2013-14		945.9 MW	2631.9 MW
6	2014-15		1112.07 MW	3743.97 MW
7	2015-16	2000	3018.883 MW	6762.85 MW
8	2016-17	12000	2249.81 MW	9012.46 MW (as on 31.12. 2016)

4.28 When the Committee asked about the actual financial expenditure *vis-à-vis* allocation of the Solar Mission, the Ministry furnished:

Year	BE (Rs. Crore)	RE (Rs. Crore)	Actual Expenditure (Rs. Crore)
2010-11	349.4	349.40	349.40
2011-12	492	652.30	652.06
2012-13	572.88	638.64	598.77
2013-14	566.77	779.97	692.28
2014-15	1587.50	1158.50	1158.19
2015-16	1947.00	3147.00	3146.24
2016-17	3140	2901.70	~1788(As on 31.12.16)

4.29 When the Committee queried as to whether there is any shortfall in the achievement of physical target as well as utilization of fund under the National Solar Mission, the Ministry replied:

> "There are no shortfall in achievement of target so far. However, the target of 17000 MW cumulative capacity by March 2017 may fall short. Major constraints being faced by the developers in commissioning of solar are land acquisition, evacuation infrastructure, conducive state policy for development of solar and business environment such as willingness of DISCOMS to purchase solar power, power evacuation infrastructure etc. Ministry is making its concerted efforts to sort out the issues with the help of all stakeholders."

4.30 On a query about the present cost of production of solar power generation, the Committee are informed :

> **"**The tariff determined by Central Electricity Regulatory Commission (CERC) in case of Solar Photo Voltaic projects is Rs.5.68 per kWh and Rs.5.09 per kWh without and with Accelerated Depreciation benefit respectively. However, in a bidding in the State of Rajasthan, the tariff discovered has come to Rs.4.34 per kWh."

4.31 On being asked as to how the high cost of production affect the utilization of solar power generation, the Ministry stated:

> "Cost of production is reflected in tariff offered by developers during bidding process. From 2010-2016, the tariff has come down from Rs.17.00 per unit to Rs.4.34 per unit. Lowering of tariff is helping in promotion of solar power."

4.32 When the Committee desired to know the initiatives taken by the Government to scale down cost of solar power production, the Ministry stated:

> "The Government is promoting solar energy through fiscal and promotional incentives. This apart, Government is providing conducive policy framework at Central and State level."

4.33 On being asked about the status of implementation of the Net-Metering in the country, the Ministry stated that 35 States/UTs out of 36 States/UTs have notified the regulations/tariff order for net metering/gross metering except Arunachal Pradesh.

4.34 On a query regarding solutions to the problems faced in evacuation of solar power, the Ministry have suggested expansion and up gradation of transmission network. When the Committee desired to know about the initiative taken in this regard, the Ministry stated:

> "There are challenges in evacuation of solar power projects being set-up at different locations across the country. In order to address these challenges, the Ministry is making concerted efforts for evacuation of renewable energy including solar power from the solar projects, including under the Green Energy Corridors project that is under implementation. In addition to inter-state transmission network for connecting renewable resource states under Green Corridor-I , a Green Corridors-II for solar parks has commenced for connecting solar parks in different states including Andhra Pradesh, Madhya Pradesh, Karnataka, Rajasthan and Gujarat. The first phase of the program is designed to support 33 GW of solar and wind power. The second phase will support 22 GW capacity."

4.35 When asked about the physical target and financial allocation under solar energy for the year 2017-18, the Committee were informed:

> "The target for the year 2017-18 is setting up of 10000 MW grid connected solar power for which the budgetary allocation of Rs.2661 crore has been made in the Demands for Grants 2017-18 of the Ministry."

4.36 On being asked as to whether the budgetary allocation will be sufficient to achieve the physical target set for the year 2017-18, the Ministry have stated that the budgetary allocation will be sufficient as most of the investment come from the private sector and public sector companies.

(C) Biomass Power and Bagasse Co-generation Programme

4.37 Biomass Power and Bagasse Co-generation Programme is being promoted by the Ministry during the year. The Programme aims at efficient utilization of biomass such as agro-residue in the form of stalks, stems and straw; agro-industrial residues such as shells, husks, de-oiled cakes and wood from dedicated energy plantations for power generation. The potential for power generation from agricultural and agro-industrial residues is estimated at about 18,000 MW. With progressive higher steam temperature and pressure and efficient project configuration in new sugar mills and modernization of existing ones, the potential of surplus power generation through bagasse cogeneration in sugar mills is estimated at 7,000 MW.

4.38 Reportedly over 530 biomass power and cogeneration projects aggregating to about 8025 MW capacity have been installed in the country upto December, 2016 for feeding power to the grid.

4.39 The estimated Biomass resource and associated power potential for the categories of agro and forest & wasteland residues (State-wise) as furnished by the Ministry are as follows:

State	Agro Residues	Forest & Wasteland Residues
	Power Potential (MW)	Power Potential (MW)
Andhra Pradesh	520.8	341.1
Arunachal Pradesh	9.2	846.3
Assam	283.7	339.4
Bihar	640.9	116.3
Chhattisgarh	248.3	1269.2
Goa	20.9	16.7
Gujarat	1224.8	1150.0
Haryana	1456.9	36.3
Himachal Pradesh	132.6	282.2
Jammu & Kashmir	37.1	1059.1
Jharkhand	106.7	455.0
Karnataka	1195.9	924.3
Kerala	864.4	200.0
Madhya Pradesh	1373.3	1718.0
Maharashtra	1983.7	1741.6

Manipur	14.3	116.7
Meghalaya	11.3	157.5
Mizoram	1.1	147.0
Nagaland	10.0	77.9
Odisha	429.1	851.8
Punjab	3172.1	36.9
Rajasthan	1126.7	881.6
Sikkim	2.3	49.1
Tamil Nadu	1159.8	429.9
Telangana	342.5	147.0
Tripura	3.0	95.7
Uttar Pradesh	1748.3	514.1
Uttarakhand	81.0	427.8
West Bengal	529.2	133.0
Total	**18729.9**	**14561.5**

4.40 When asked about the State-wise installed capacity *vis-a-vis* estimated biomass/ bagasse co-generation power potential, the Ministry furnished :

S.No.	State	Total installed capacity of biomass power and bagasse cogeneration
1	Punjab	178.5
2	Telangana	158.01
3	Maharashtra	1967.85
4	Uttrakhand	72.72
5	Haryana	96.4
6	Gujarat	65.3
7	Rajasthan	119.25
8	Andhra Pradesh	378.2
9	Madhya Pradesh	92.536
10	Karnataka	1402.55
11	Chhattisgarh	228.49
12	West Bengal	300.0
13	Uttar Pradesh	1933.11
14	Tamil Nadu	878.15
15	Bihar	103.5
16	Odisha	50.4
Total		8025.0

4.41 When asked about the physical achievements *vis-à-vis* targets during the last three years, the Ministry furnished:

Financial Year	2014-15	2015-16	2016-17
Targets (in MW)	400	400	400
Achievements (in MW)	418.67	304.85	101

4.42 Regarding non-achievement of physical targets for the year 2015-16, the Ministry stated that the shortfall during the years 2015-16 is primarily attributable to the issues relating to revision of tariff for biomass power by SERCs as per CERC guidelines and biomass supply chain management.

4.43 On a query about the budgetary allocation *vis-à-vis* utilization for the last three years under biomass /bagasse cogeneration, the Ministry stated:

Budget	2013-14	2014-15	2015-16	2016-17
Allocation* (in crore)	55	38	29	20
Achievements (in crore)	31.34	25	29	10.30

*****As per Outcome Budget

4.44 When asked about the non-utilization of funds in all these years, the Ministry stated:

> "The central financial assistance (CFA) for biomass power projects is released on successful commissioning and performance assessment by independent agencies. Release of CFA also gets delayed sometimes due to non-availability of relevant documents."

4.45 Regarding physical targets and budgetary allocation for the year 2017-18, the Ministry stated that a physical target of 350 MW has been fixed for 2017-18 with a budgetary allocation of Rs.20 crore and they also informed the Committee that the allocation will be sufficient to achieve the set target.

4.46 When asked about the activities proposed to be undertaken under the programme during 2017-18, the Ministry replied:

> "Major activities/projects proposed to be undertaken during 2017-18 include evaluation of existing scheme and formulation of new scheme on the basis of recommendations to promote power generation from biomass & bagasse cogeneration plants."

4.47 On being asked about the provisions of fiscal and financial incentives provided by the Government in biomass/ bagasse co-generation sector, the Ministry furnished as follows:

I. Fiscal incentives

Item	Depreciation
Income Tax	
1. Depreciation	100% depreciation can be claimed in the first year for the following power generation equipment: 1. Fluidized Bed Boilers 2. Back pressure, pass out, controlled extraction, extraction and condensing turbine for Power generation with boilers 3. High efficiency boilers 4. Waste heat recovery equipment
2. Tax Holiday	10 year tax holiday (Ending on 31st March 2017)
3. Central Excise & Custom Duty	Exempted for renewable energy devices, including raw materials, components and assemblies.

II. Financial Incentives

Project Type	Special Category States	Other States
Biomass Power projects	Rs.25 lakh X (C MW) (Maximum Support of Rs.1.5 crore per Project.)	Rs.20 lakh X (C MW) (Maximum Support of Rs.1.5 crore per Project.)
Bagasse Co-generation by Private sugar mills	Rs.18 lakh X (C MW) (Maximum Support of Rs.1.5 crore per Project.)	Rs.15 lakh X (C MW) (Maximum Support of Rs.1.5 crore per Project.)
Bagasse Co-generation projects by cooperative/ public sector sugar mills 40 bar & above 60 bar & above 80 bar & above	 Rs.40 lakh Rs.50 lakh Rs.60 lakh Per MW of surplus power (maximum support Rs.6.0 crore per project)	 Rs.40 lakh Rs.50 lakh Rs.60 lakh Per MW of surplus power (maximum support Rs.6.0 crore per project)

D. Small Hydro Programme

4.48 The Ministry of New and Renewable Energy have been vested with the responsibility of developing Small Hydro Power (SHP) projects up to 25 MW station capacity. The Ministry have announced a scheme for implementation of small hydro projects along with various other sub-scheme. The finer classification among various capacities under small hydro with respective application/uses as per the Ministry's report is as given below:

Type	Use	Capacity (kW)
Water Mills	For local use	Up to 5
Micro	Village electrification	Up to 100
Mini	Village Electrification & Grid	101 to 2000
Small	Grid	2001 to 25000

4.49 When the Committee asked about the estimated potential for power generation and installed capacity in the country from small hydro power (State-wise), the Ministry stated that the identified potential of small hydro power in the country is 21135.24 MW from 7135 identified sites (Identification of sites is a dynamic process. Sites are identified by Government as well as self-identified by Private Developers). State wise details as furnished by the Ministry are given below:

S No.	State	Sites	Potential	Achievement	Under Implementation	
		Nos.	(MW)	(MW)	Nos.	(MW)
1	Andhra Pradesh &Telangana	453	511.66	241.98	2	11.00
2	Arunachal Pradesh	800	2064.91	104.60	17	57.05
3	Assam	106	201.99	34.11	5	33.00
4	Bihar	139	526.98	70.7	13	24.30
5	Chhattisgarh	199	1098.2	76	1	24.75
6	Goa	7	4.7	0.05	0	0
7	Gujarat	292	201.97	16.6	13	92.31
8	Haryana	33	107.4	73.5	1	0.10
9	Himachal Pradesh	1049	3460.34	798.81	30	288.60
10	Jammu & Kashmir	302	1707.45	158.03	25	58.95
11	Jharkhand	121	227.96	4.05	0	0
12	Karnataka	618	3726.5	1220.73	3	13.40
13	Kerala	238	647.15	205.02	8	66.52
14	Madhya Pradesh	299	820.45	86.16	0	0
15	Maharashtra	270	786.46	346.175	15	49.65
16	Manipur	110	99.95	5.45	0	0
17	Meghalaya	72	230.05	31.03	2	25.50
18	Mizoram	98	168.9	41.47	4	8.70
19	Nagaland	98	182.18	30.67	8	3.75
20	Odisha	220	286.22	64.62	3	18.50
21	Punjab	375	578.28	170.9	9	25.80
22	Rajasthan	64	51.67	23.85	0	0
23	Sikkim	88	266.64	52.11	2	15.00
24	Tamil Nadu	191	604.46	123.05	0	0
25	Tripura	13	46.86	16.01	0	0
26	Uttar Pradesh	7	7.27	25.1	1	1.50
27	Uttarakhand	251	462.25	209.32	11	33.35
28	West Bengal	442	1664.32	98.5	0	0
29	A&N Island	179	392.07	5.25	0	0
	Total	7134	21135.24	4333.85	174	863.73

4.50 On being asked about the physical targets and achievements under SHP programme during the last three years, the Ministry furnished:

S.No.	Year	Target (MW)	Achievement (MW)
1	2014-15	250	251.6
2	2015-16	250	218.6
3	2016-17	150	68.9 (as on January 2017)

4.51 When the Committee queried about the non-achievements of targets, the Ministry replied:

> "There may be some likely short fall. Although 174 number of projects of aggregate capacity of 864MW are in various stages of implementation, delay in completion of about 68 projects aggregating to 234MW are mainly due to cost overrun, change in design and other technical issues, difficult weather and geographical conditions, natural calamities such as flash flood and some local issues.

Some state specific reasons include: a) Uttarakhand - ban due to “Eco sensitive Zone” and natural calamities due to cloud burst leading to flash flood resulting to washout of constructed work at project sites; b) Jammu and Kashmir - short working season clubbed with disturbance/ months long curfew (still in practice - part and for few days) during working / transportation season affected 14 SHP projects under implementation – July 2016;and c) Cost overrun in Arunachal Pradesh and Bihar affecting 26 SHP projects, including flash flood in Arunachal Pradesh."

4.52 On being queried about the utilization of funds *vis-a-vis* allocation for the last three years under SHP, the Ministry furnished:

S.No.	Year	Financial support (Rs. in Crore)	
		Budget allocation	Expenditure
1	2013-14	123.18	122.82
2	2014-15	108.00	107.99
3	2015-16	105.5	104.99

4.53 When asked about the physical target and budgetary allocation for SHP Programme for the year 2017-18, the Ministry stated:

"Physical target for the year 2017-18 is 100 MW. Budgetary allocation is Rs.134.5crore. There is a committed liability of around Rs.575.354 crore for on-going SHP projects."

4.54 On being asked as to whether the allocation would be sufficient to achieve the target, the Ministry stated that it will be sufficient to meet the target.

4.55 On a query about the major activities/projects proposed to be undertaken under SHP Programme during 2017-18, the Ministry stated:

"Implementation of SHP program is presently approved for 12th plan period i.e. 31.03.2017 besides this Ministry is considering/ proposals for following major activities during 2017-18:-

i) Reassessment/ confirmation i.e. marking of SHP sites on the ground through State Governments in the country.

ii) Formulation of new scheme for implementation of Small Hydro Program in the country with effect from 01.04.2017 to 31.03.2022 or till next amendment."

4.56 Regarding the provisions of fiscal/financial incentives and subsidies, the MNRE have stated that they have been providing financial support/subsidy for following activities towards development of SHP sector-

i. Research and development, capacity building

ii. Resource assessment, Detailed Survey and Investigation, DPR Preparation and Perspective Plans for States

iii. Capital Subsidy to State Sector Project

iv. Subsidy for Commercial Projects

v. Renovation and Modernization of old SHP projects (State sector)

vi. Water Mills/Micro-hydel projects.

4.57 The following incentives/subsidies are given by MNRE for SHP projects:

I. Support for Survey, Investigation and Preparation of DPRs for identification of new potential sites

- Rs.6.00 Lakh for project upto 1.00 MW capacity and
- Rs.10.00 Lakh for project with more than 1.00 MW &upto 25 MW capacity to the Govt. dept./agencies

II. Support to new SHP project in the Government/State Sector:

Areas	Up to 100 KW & upto1000 KW	Above 1 MW &upto 25 MW
N.E. States, J & K, H.P. Uttarakhand (Special Category States)	Rs.75,000 per KW	Rs.7.5 crore/MW limited to Rs.20.00 crore per project
Other States	Rs.35,000 per KW	Rs.3.5 crore/MW limited to Rs.20.00 crore per project.

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

III. Support to new projects in the private, Co-operative, Joint sector:

Category	Above 0.1 MW – 25 MW
N.E. States, J & K, H.P. Uttarakhand (Special Category States)	Rs.1.5 crore/MW limited to Rs.5.00 crore per project
Other States	Rs.1.00 crore/MW limited to Rs.5.00 crore per project

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

IV. Scheme to support Renovation & Modernization of old SHP projects in Government/State sector:

Category	Up to 1000 KW	Above 1 MW &upto 25 MW
All States & UTs	Rs.10,000 per KW	Rs.1.00 crore/MW limited to Rs.10.00 crore per project

- Minimum 50% contribution of the project cost from the state sector project implementing organization of the work.
- The subsidy would be released in four installments based on the progress in the project.

V. Central Financial Assistance for Watermills and Micro Hydel Projects:

a. Watermills:

S.No.	Category of Watermill	Amount of CFA
1.	Mechanical output only	Rs.50,000/- per Watermill
2.	a. Electrical output (upto 5KW) or b. Both mechanical and electrical output (upto 5 KW)	Rs.1,50,000/- per Watermill

b. Micro Hydel Projects up to 100 KW capacity**:**

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

4.58 When the Committee queried about the progress with regard to the National Mission on Small Hydro, the Ministry replied:

> "Ministry has proposed to achieve a target of 5000 MW by 2022 through SHP. Ministry is also considering/proposes for following major activities during 2017- 18; Reassessment / confirmation i.e. marking of SHP sites on the ground through the State Governments in the country; Based on the outcome of the evaluation Study on SHP programme implemented during 12th Five year Plan scheme for Small Hydro may be formulated."

CHAPTER V

RENEWABLE ENERGY FOR RURAL APPLICATIONS

5.1 The Ministry of New and Renewable Energy have been supporting various 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 have also been implementing remote village electrification programme and village energy security test projects.

5.2 The Ministry have been supporting renewable energy programmes for rural areas of the country by deploying renewable energy systems such as family type biogas plants, solar water heating systems, solar cookers and other solar energy devices. In addition to family type biogas plants, the demonstration of integrated Technology package on Biogas-Fertilizer Plants (BGFP) for generation, purification/ enrichment, bottling and piped distribution of biogas as technology demonstration under RDD&D policy was launched during the year 2009-10 and continued in 2015-16. The objectives of the integrated technology demonstration programme is to demonstrate the biogas fuel applications to meet stationary, motive power, electricity needs including cooking and heating requirements.

5.3 On a query about the programmes/schemes/projects being undertaken under Renewable Energy for Rural Applications, the Ministry furnished the following:

> "i. The National Biogas and Manure Management Programme (NBMMP) aims at setting up family type biogas plants for meeting cooking energy and lighting needs of mainly rural and semi-urban households of the country. So far around 49.09 lakh family type biogas plant have been installed in the country.
>
> ii. The Ministry is implementing Unnat Chulha Abhiyan Programme from June, 2014 with the objective of providing clean energy solution to reduce drudgery of women and children through reduced consumption of fuel wood, saving in cooking time and reduction of emissions.
>
> iii. The Remote Village Electrification Scheme was discontinued in 2014 and electrification of un-electrified villages is now implemented by Ministry of Power. The funds have been kept for catering pending liabilities."

5.4 When asked about the Budgetary Allocation along with BE/RE and actual expenditure under Renewable Energy for Rural Applications during the last three years, the Ministry furnished:

(Rs. In crore)

Financial Year	Financial Allocation		Actuals
	BE	RE	
2014-15	157.50	153.50	148.63
2015-16	131.00	92.56	102.91
2016-17 *	208.00	165.50	72.03

*All the schemes (Remote Village Electrification, Biogas Programme and Cookstoves) under Renewable Energy for Rural Applications have been merged under Off-Grid/Distributed and Decentralized Renewable Power.

5.5 On being asked about the physical achievements *vis-à-vis* targets during the last three years, the Ministry furnished:

Schemes	2014-15		2015-16		2016-17	
	Tar	Ach	Tar	Ach	Tar	Ach
Bio-Gas Programme	1.10 lakh	0.85 lakh	1.10 lakh	0.75 lakh	1.0	0.36 lakh
Remote Village Electrification	-	313	Programme has been discontinued.			
Improved cook-stove Programme	314800	12713	110200	26203	71900	Progress awaited from states.

5.6 On a query for the reasons for continuous non-achievement of targets, the Ministry stated:

> "The major reasons for shortfall of physical targets under the Biogas scheme include: a) back-to-back drought conditions of last two years' b) high upfront cost of biogas plants; c) reduced subsidy support; d) lack of priority at state level. In regard to cook stove programme to the state are gearing up to create institutional mechanism for implementation of the programme, and the progress is expected to increase progressively."

5.7 On being asked about the corrective measures taken by the Ministry in the implementation of the programme as to achieve the desired result, the Ministry have stated that an evaluation study is being carried out and the programme will be realigned with recommendation of the study.

5.8 When the Committee desired to know the programme/project/scheme being covered under Renewable Energy for Rural Applications in the year 2017-18, the Ministry stated:

> "Renewable Energy for Rural Applications includes RVE, Biogas and others including Cookstoves. Among these, RVE has been merged with Off-Grid Solar and the other two-Biogas and Others including Cookstoves have been merged under Off-Grid-Biogas and Off-Grid-Other Renewable Energy Applications respectively."

5.9 On being queried about the Budgetary Allocation made under the head for the year 2017-18, as well as physical targets, the Ministry stated:

(Rs. In crores)

Programme /Scheme	Allocation for 2017-18	Physical Target
Biogas under Off-Grid/Distributed and Decentralized Renewable Power	134.00	1.1 lakh (in nos.)
Others including Cook stoves under Other Renewable Energy Applications	1.00	-

5.10 On a query regarding status of implementation of Remote Village Electrification Programme, the Ministry stated:

> "The Remote Village Electrification Scheme was discontinued in 2014 and electrification of un-electrified villages is now implemented by Ministry of Power. Hence no targets fixed for 2016-17 and 2017-18."

CHAPTER VI

RENEWABLE ENERGY FOR URBAN, INDUSTRIAL AND COMMERCIAL APPLICATIONS

6.1 The MNRE has 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 Programme; ii) energy Recovery from Urban, Industrial and Agricultural Wastes; and iii) Bioenergy and Cogeneration in Industry.

6.2 When the Committee desired to know the programmes being covered under Renewable Energy for Urban, Industrial and Commercial Applications, the Ministry stated :

> ″The Ministry is Implementing the Programme on Energy from Urban, Industrial and Agricultural Wastes / Residues during 12th Plan period. The main objective of the programme is to promote setting up of projects for recovery of energy from urban, industrial and agricultural wastes and to create conducive conditions and environment, with fiscal and financial regime to develop, demonstrate and disseminate utilization of wastes and residues for recovery of energy".

6.3 The Ministry further stated that in addition to MNRE'S efforts under the programme, the Ministry of Urban Development is also implementing “Swachh Bharat Mission” (SBM) since 2nd October, 2014, which also includes setting up of waste to energy plants with Central support up to 35% of the project cost in the form of Viability Gap Funding (VGF) / grant, subject to the overall State-wise funds envelop for SBM.

6.4 When asked about the achievements *vis-à-vis* targets (both physical and financial) under Urban, Industrial and Commercial Applications during last three years, the Ministry furnished as under:

> "i. Development of Solar Cities Programme : Against the target of 60 solar cities, sanctions have been issued for all 60 solar cities. Master Plans have been prepared for 49 cities, Stakeholders Committees have been constituted in all 60 cities and Solar City Cells have been created in 36 cities. Bhubaneswar, Chandigarh, Gandhinagar, Mysore and Nagpur have been identified as ‘Model Solar Cities’ with financial support upto 9.50 core for each city. Further, 13 cities i.e. Agartala, Coimbatore, Rajkot, Shimla, Faridabad, Thane, Raipur, Shirdi, Leh, Aizawl, Puducherry, Vijayawada and Amritsar have been identifies as Pilot Solar Cities with financial support upto 2.50 core for each city.
>
> A Green Campus under the “Development of Solar Cities Programme” aims to reduce fossil fuel based consumption in next five years by 25% through renewable energy applications and energy efficiency measures. The financial

support upto □ 5.0 lakh is provided for developing a green campus in the educational Institutions, office complexes, residential and commercial complexes etc. So far, sanctions have been given for 52 campuses to be developed as green campus. So far Rs.1.835 crore has been released during FY 2016-17 under 'Development of Solar Cities Programme'. The funds could not be utilized due to non-availability of suitable proposals from the States/Municipal Corporations under 'Development of Solar Cities Programme'.

ii. Energy Efficient Solar/Green Buildings : The GRIHA Secretariat created with support from MNRE has become an independent body as 'GRIHA Council', which is providing GRIHA Ratings in the country. During 2016-17 GRIHA Ratings provided to 7 Government buildings for which the support was provided by MNRE in terms of exemption from the rating fees.13 nos. one day 'Capacity Building and Awareness Programme' and 13 nos. 'Evaluators and Training Programmes' were organized. So far Rs.24.94 Lakh has been released during FY 2016-17 under 'Energy Efficient Solar/Green Buildings' programme and GRIHA certification."

6.5 On being queried about the physical achievements *vis-a-vis* targets for the last three years under Waste to Energy Programme, the Ministry stated:

"Against the physical target of 25 MW set during the last three years i.e. 2014-15, 2015-16 and 2016-17, about 40 MW have been achieved under Waste to Energy programme."

6.6 Regarding the financial utilization *vis-a-vis* allocation, the Ministry have stated that against the financial allocation of Rs.61.5 lakh set during the last three years i.e. 2014-15, 2015-16 and 2016-17, about Rs.29.59 lakh have been utilized under Waste to Energy programme.

6.7 When queried about the reasons for non-achievement of target and low utilization of funds, the Ministry stated:

"Delay in obtaining all clearances / approvals by the project developer from various agencies such as NOC from State Pollution Control Board, loan approvals from the banks and Appraisal Note, signing of PPA, approval for filling & storage of CBG/Bio-CNG from Petroleum and Explosives Safety Organization (PESO), Analysis Report of Effluent quantity and characteristics from accredited lab, etc.

Delay in procurement of equipment& construction leads to the delay in project commissioning and successful operational trial and hence delays in submitting Performance report for generation for 3 months, Inspection report of the Project by State Nodal agencies."

6.8 When asked to furnish the budgetary allocation along with physical target for the scheme/technologies under Renewable Energy for Urban, Industrial and Commercial Applications for the year 2017-18, the Ministry stated:

"During 2017-18 a total amount of Rs.14.20 Crore has been allocated for Other Renewable Energy Applications (Solar Cities, Green Buildings etc.), Demonstration of Renewable Energy Applications, Cook stoves etc. The completion of various activities under solar cities programme will be done during 2017-18."

6.9 On being asked about the physical targets and budget estimates for Waste to Energy programme during 2017-18, the Ministry furnished :

	Target for FY 2017-18		
	Grid	Off-Grid	Total
Financial	Rs.5 Crore	Rs.25 Crore	Rs.30 Crore
Physical	5 MW	20 MW	25 MW

6.10 When the Committee desired to know the steps taken/proposed to be taken by the Ministry to achieve the targets under this programs during 2017-18, the Ministry have stated:

"The Ministry has already sanctioned 31 new projects with a cumulative capacity of about 33.62 MWeq during 12th plan period. These projects are at various stages of commissioning and expected to be installed and commissioned during the next financial year 2017-18."

6.11 The Ministry have also stated that they have been requesting the State Nodal Agencies (SNAs) and other stakeholder regularly to develop suitable proposals for recovery of energy from urban, industrial and agricultural wastes for seeking central support. In addition, the Ministry are also supporting awareness programmes involving industrial sector to develop suitable proposals for meeting captive thermal and electrical needs.

6.12 On a query regarding provisions of fiscal and financial incentives provided by the Government for Renewable Energy for Urban, Industrial and Commercial Applications, the Ministry furnished:

i) "Incentives to State Nodal Agencies: service charge @ 1% of the subsidy restricted to Rs.5.00 lakh per project,
Financial Assistance for promotional activities: for organizing training courses, business meets, seminars/workshops and publicity/awareness, subject to a maximum of Rs.3.0 lakh per activity.

ii) The scheme provides for Central Financial Assistance (CFA) in the form of capital subsidy and Grants-in-Aid in respect of the Biogas production from Industrial waste; Power generation or production of bio-CNG from biogas produced from sewage and industrial wastes or from Urban and Agricultural wastes through biomethanation, combustion, gasification, pyrolysis or a combination thereof are being supported which are proven and are environmentally benign technologies."

6.13 On a query about the Fiscal Incentives, the Ministry furnished:

> i) "Accelerated Depreciation: Tax depreciation rate of 80% under AD benefits
>
> ii) Income Tax Holidays: 10 years Income tax benefit allowed for Power for Plants commissioned upto March 2017.
>
> iii) Concessional Custom Duty Exemption, Excise Duty Exemption. During the Budget 2017 witch proposed Basic Customs Duty (BCD) and Excise Duty concessions on all items of machinery required for balance of systems operating on bio-gas or bio-methane or by-product hydrogen reduced to 5 per cent and 6 per cent respectively would help the promoters / developers to avail these concessions to improve economic viability of the projects."

6.14 Details of the CFA provided by the Ministry as furnished by them are given below:

Wastes/Processes/Technologies	Central Financial Assistance
Power generation from Municipal Solid Waste	Rs.2.00 crore/MW (Max. Rs.10crore/project)
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)
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)
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)
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)

6.15 When the Committee desired to know about the current status and performance of Waste to Energy Plants in the country, the Ministry furnished:

> "The Ministry, as per the direction of the Hon'ble Supreme Court, has taken up 5 pilot projects with an aggregate capacity of 57 MW under its programme on Energy Recovery from Urban, Industrial and Agricultural Waste Residue. Out of which, one plant at Okhla Delhi is operational and another one at Ghazipur, Delhi is under commissioning. The remaining 3 projects could not be completed due to paucity of funds / technical reasons. It has been observed that except the Okhla and Ghazipur Plants, all the remaining Waste to Energy Plants, including the

Pune Plant, have completely failed to take off. The working of the Okhla Plant (Delhi) was satisfactory."

6.16 Details of 5 pilot projects taken up under programme on Energy Recovery from Urban, Industrial and Agricultural Waste Residue as furnished by the Ministry:

S. No	Project promoters	Location	Capacity (MW)	Technology	Project cost (Rs. in crores)	Present status
1	M/s. TimarpurOkhla Waste Management Private Ltd. (TOWMCL) Jindal ITF Centre, 28 ShivajiMarg, New Delhi (Promoted by Jindal Urban Infrastructure Ltd.)	Old NDMC Compost plant, New Okhla tank, New Delhi	16	Combustion & Processing 1950 MT MSW per day	188.28	Commissioned in January 2012
2	M/s East Delhi Waste processing Company (P) Ltd., New Delhi (Promoted by DIAL, IL&FS Energy Dev. Co. Ltd. (IEDCL) and SELCO International Ltd.)	Gazipur, Delhi	12	Combustion	155.42	Project installation completed and is under trail run/ commissioning
3	M/s SrinivasaGayatri Resource Recovery Limited No. 303, ShreshtaBhumi Complex, No. 87, K.R. Road, Next to GayanaSamaja, Bangalore	Village Mandur, Bangalore	8	Combustion	70.33	Project could not be completed due to paucity of funds, sanction cancelled
4	M/s. RDF Power Projects Ltd.401, Galada Towers, Adjacent Lane to Pantaloons, Begumpet, Hyderabad	Chinnaravul-apally Village, Bibinagar Madal in Nalgonda District, A.P.	11	Combustion	114.11	Project could not be completed due to paucity of funds
5	M/s. Rochem Separation Systems (India) Pvt. Ltd., 101, HDIL Towers, AnantKanekarMarg, Bandra (E), Mumbai.	Hadapsar, Pune	10	Gasification	90.00	Installed 1st phase of 2.6 MW and is not operational due to technical reasons. The Committee visited the plant. No generation of electricity and project is complete failure.

6.17 The Ministry have further stated that the following projects are operating based on MSW:

S. No.	Name of city/town	Waste intake (MT/day)	Power generation (MW)
1.	Solapur, Maharashtra	400	3
2.	Rebladevpally (V), Sultanabad (M), Karimnagar, Telangana	1100	12 (15 days in a month – 9MW)
3.	Ghazipur, Delhi	---	16
4.	Jabalpur, Madhya Pradesh	---	11.4
5.	Narela-Bawana, Delhi	---	24
Sub-Total			66.4

6.18 When asked about the modes of financing, existing financial support available and possible options for funding capital and operation & maintenance costs with respect to W to E Plants, the Ministry stated:

> "The Government of India, through various schemes extends financial support for introducing appropriate solid waste management systems and for setting up processing and disposal facilities. These include: a) Viability Gap Funding Swachh Bharat Mission of MoUD; b) Loan from IREDA; c) Grants from MNRE for Supporting W to E Projects; d) Preferential Tariff by Regulators; and e) Support for Purchase of Compost from Ministry of Agriculture."

CHAPTER VII

RESEARCH, DESIGN, DEVELOPMENT AND DEMONSTRATION IN RENEWABLE ENERGY

7.1 According to the MNRE, their Research & Development activities aims at resource assessment, technology development, demonstration and commercialization for promoting the large scale use of new and renewable energy across the country. The Ministry support Research, Design, Development and Demonstration (RDD&D) to develop new and renewable energy technologies, processes, materials, components, sub-systems, products & services, standards and resource assessment so as to indigenously manufacture renewable energy devices and systems.

7.2 The Ministry further stated that the underlying purpose of RDD&D efforts is to make industry competitive and renewable energy generation supply self-sustainable/profitable and thereby contribute to increased share in total energy mix in the country. The Ministry support RD&D to various R&D/academic institutions, industries, NGO's etc. for technology development and demonstration in the field of solar, wind, biogas, biofuel, hydrogen and fuel cells, geothermal, etc. An award scheme has been introduced to encourage young Scientists for innovation. The RD&D efforts are continued with emphasis on efficiency improvement and cost reduction.

7.3 When asked about the budgetary allocation and the actual expenditure during the last three years, the Ministry furnished:

Rs. in crore

Year	BE	RE	Expenditure
2014-15	149.50	128.00	127.45
2015-16	90.00	106.00	100.98
2016-17	445.00*	336.50*	187.39*

*The Budget is for research, development and international cooperation.

7.4 When asked the major Programme/Research undertaken and achievements made during the last three years, the Ministry, in a note, stated:

> "Major programmes were supported in the area of Solar Photovoltaic, Solar Thermal, hydrogen, fuel cells and wind-solar hybrid systems. In solar, high efficiency crystalline silicon solar cells of 18% efficiency was achieved in lab scale under a project at IIT, Bombay. Support for developing solar cells using other materials, storage and power electronic system was provided to R&D/academic institutions. Support for developing solar thermal system and

component was provided for technology development and demonstration for utilizing solar energy for thermal and power generation applications. Research and Development supported in hydrogen and fuel cells focused on technology development and demonstration for hydrogen production and storage for stationary and transport applications."

7.5 On a query regarding non achievement of targets during the years, the Ministry stated that the ongoing projects were evaluated for taking up new projects for furthering R&D efforts.

7.6 Regarding the allocation for the year 2017-18, the Ministry informed that an amount of Rs.144 crore has been allocated for research, demonstration and development during 2017-18.

7.7 When the Committee desired to know about the thrust areas identified for R&D support under the new and renewable energy sector for the year 2017-18, the Ministry informed:

"The MNRE organized a “Brainstorming Consultations Meeting on RD&D” on 5.01.2016 for identifying the thrust areas with action plan for RD&D. The thrust areas and action plan in the areas SPV, Solar Thermal, Storage including Power Control Systems, Biogas, Biofuel, Wind, Wind Hybrid, Hydrogen and Fuel Cells and SHP with emphasis on collaboration including industry was prepared and placed in MNRE website for implementation."

7.8 On being asked about the steps taken up by the Government, specifically with regard to facilitating research, design and development for technological advancements in Solar Energy Sector, the Ministry replied:

"The MNRE has supported Centers for Excellence technology demonstration, apart from R&D projects supported to R&D institutions/industries for giving thrust to R&D in solar energy area. The Centers for Excellence have provision for collaboration with other institutions and industries for technology development and also for conducting training for promoting R&D and also for operation and maintenance of solar energy systems/components. Thrust areas with action plan for RD&D with emphasis on collaboration was prepared or implementation."

7.9 Detailing the Research and Development (R&D) activities being undertaken at the Solar Energy Corporation of India (SECI) for intensive harnessing of Solar Energy potential in the country, the Ministry informed:

"SEC is implementing a R&D project entitled “Development of Solar PV and wind hybrid power plant with large scale battery storage at Kaza, Himachal Pradesh and “Setting up facility for calibration of solar radiation measuring sensors and its analysis/modeling based on ground surface measurement."

7.10 Regarding the technological up gradation undergoing with regard to solar PV and Solar Thermal, the Ministry stated:

> "In Solar PV, R&D efforts are directed to improving the efficiency of solar cells, developing invertors, power electronic systems storage systems. R&D efforts for developing higher efficiency solar cells of 20% are underway. In solar thermal, the efforts are directed towards technology development and demonstration for utilizing solar energy for industrial process heat, and power generation and other application."

Part –II

Observations/Recommendations of the Committee

Performance during Twelfth Five Year Plan

1. The Committee note that the gross budgetary support of the Ministry for the entire 12th Five year Plan period is Rs.19113.00 crore. An amount of Rs.13961.21 crore has been actually allocated during the 12th Plan period. So, Rs.5151.79 crore i.e. about 27% of the total allocation will be left unutilized altogether. The Total actual expenditure of the 12th Plan, as on 31.12.2016, is Rs.12246.1 crore which accounts for only 54% of the GBS allocation for the entire 12th Plan. As 12th Plan is going to end in March, 2017, the Ministry are expected to utilize full allocation of the 12th Plan given the ambitious target of 175 GW of Renewable Power by 2022. Keeping in view, the significance of the Sector, the non-utilization of the allowed sum during the plan period reflects poorly on the performance of the Ministry. Therefore, the Committee recommend that:

i) The Ministry should focus on maximum utilization of allocated funds, so that the stipulated targets can be achieved.

ii) Further necessary corrective steps should also be taken for alleviation of reasons responsible for low utilization of allocated funds, so as to achieve the projected targets with proper and exhaustive utilization of fund allocated.

2. The Committee find that the financial achievement for the first 4 years of 12th Plan period i.e. from the year 2012-13 to 2015-16 were 96.24%, 93%, 99.34% and 99.56%, however, for the 5th year of the 12th Plan, the financial achievement (upto 31.12.2016) is only 64.74%. The Committee note with satisfaction that against the physical target of 16680 MW for the period 2012-13 to 2015-16, the Ministry have been able to achieve 17964.55 MW. But, during 2016-17 (upto 31.12.2016) the achievement is only 4341.22 MW as against the target of 16660 MW, i.e. 12318.78 is still left to be achieved in just three months. Even though the Committee note that the physical and financial performance during the last few years have been good as compared to earlier years, the Committee are highly skeptical about the achievement of the financial and physical targets for the year 2016-17. The Committee are of the definite opinion that performance for 2017-18 will be a benchmark for its future performance with regard to ambitious target of

Renewable Energy, so no laxity in this regard will be permitted to impair the target achievement. The Committee, therefore, recommend that:

i) The Ministry should revisit their strategies and Action Plan and stress on proper planning and coordination with implementing agencies.

ii) The Ministry should identify the weak areas on the basis of their performance during the 12th Plan and take corrective steps to ensure the achievement of projected target by 2022.

3. The Committee note that during the first 4 years of the 12th Plan, the Ministry have performed well in the field of Wind Energy, Bio Energy, Solar energy etc. However, the Committee are not satisfied with the performance of the Ministry under these very programmes in the terminal year of the 12th Plan. The Committee find a mismatch between the target set and achieved under various programmes and feel that the shortfall in achievement of targets during 12th Plan is bound to have a cascading effect on the achievement of the overall target of 175 GW of Renewable Energy by 2022. Consequently, a lot more is required to be done to achieve the envisaged targets. The Committee, therefore, recommend that the Government should strive hard to achieve the maximum possible capacity addition so as to enable the country to fulfill its clean energy requirements and to achieve its Intended Nationally Determined Contribution (INDC) of 40% cumulative electric power capacity from non-fossil fuel based energy resources by 2030.

Demands for Grants of MNRE for 2017-18

4. The Committee find that the Plan Outlay (2016-17) of Rs.14192.83 crore (BE) was enhanced to Rs.16608.52 crore at the RE stage. This is mainly due to the enhanced support from the Internal and Extra Budgetary Resources (IEBR) from Rs.9192.83 crore to Rs.12301.52 crore. The Committee observe that during the last three years, the Plan Outlay of the Ministry has been enhanced at RE stage, which indicates the commitment of the Government towards implementing renewable energy programmes. The Committee appreciate the Ministry's effort to mobilize supplementary Demands for Grants at the RE stage. However, the whole amount of allocation at the RE has not been fully utilized specially in the year 2016-17. The Committee note that for the year 2017-18, the Ministry had sought Rs.5538.69 crore as Plan Outlay (excluding IEBR). However, against this, an

amount of Rs.5472.84 crore (BE) has been allocated including Rs.5341.70 crore as support from National Clean Energy Fund (NCEF). The Committee also note that there is an increase of Rs.1112.71 crore, i.e. 25.52 percent, in the budgetary support for the year 2017-18 over the Revised Estimates of the previous year's support of Rs.4360.13 crore.

The Committee are informed that additional funds will be required for achieving the ambitious targets set for renewable energy sector as for the last two years the capacity addition targets are progressively increasing thereby leading to increased liabilities including for Generation Based Incentive (GBI). The Committee also find that BE (including IEBR) for the year 2017-18 i.e. Rs.13585.43 crore is less than RE for the year 2016-17 i.e. Rs.16608.52 crore by a significant margin of Rs.3023.09 crore. Keeping in view the uncertainty over the continuance of NCEF after the implementation of Goods and Service Tax (GST), the Committee are apprehensive that unless additional allocation is made, implementation of various programmes of the Ministry will be seriously affected. The Committee observe that for the year 2017-18, the Ministry have projected Internal and Extra Budgetary Resources (IEBR) to the tune of Rs.8243.73 crore. The Committee trust that the Ministry will make all-out efforts for additional funds from IEBR to meet the requirement of extra funds. The Committee, therefore, recommend that:

i) Additional Gross Budgetary Support may be provided to the Ministry in Supplementary Demands for Grants at the RE stage;

ii) The Ministry of New and Renewable Energy should make concerted efforts to mobilize additional funds from Internal and Extra Budgetary Resources (IEBR), the National Clean Energy Fund (NCEF),other renewable energy development funds and low cost International Finance including from Green Climate Fund, so as to achieve the targets set for the current financial year under various programmes of the renewable energy sector.

National Clean Energy Fund

5. The Committee are informed that the National Clean Energy Fund (NCEF) was created out of cess on coal produced as well as imported at Rs.400 per tonne to provide financial support to Clean Energy Initiatives, Research in the field of clean energy, etc. and an Inter Ministerial Group (IMG) chaired by Finance

Secretary approves the projects/schemes eligible for financing under the NCEF. The Committee find that by 2017-18 (from 2010-11 to 2017-18) a cumulative amount of Rs.86,440.21crore would be collected as coal cess out of which only Rs.29,645.29 crore would go to NCEF and the amount financed from NCEF for projects would be Rs.15,911.49 crore i.e. only 18.41% of the total amount collected as coal cess. The Committee find that for 2016-17 (RE), the total coal cess collected was Rs.28,500 crore, against which only Rs.6902.74 crore (~24%) has actually been transferred to the NCEF out of which Rs.4272.00 crore were given to the MNRE as budgetary support from NCEF. It has been informed that till date the Inter-Ministerial Group (IMG) for NCEF has recommended 55 Projects for financial support including projects from Ministry of New and Renewable Energy; Ministry of Water Resources, River Development & Ganga Rejuvenation; Ministry of Environment and Forest; Ministry of Drinking Water and Sanitation; etc. The Committee feel that the utilization of funds from NCEF is low which may have adverse consequences for the much needed initiatives, innovations and research in the field of clean energy.

The Committee note that for 2017-18 (BE), Rs.5341.70 crore have been provided in the budget from NCEF to MNRE. However, it has been informed that with the implementation of GST, the Clean Environment Cess may be used to compensate those States that may have a revenue loss due to GST; as a result, the fund may not be available to finance Renewable Energy projects. There are also apprehensions that post GST; the delivered cost of Renewable Energy will increase. In view of the above, the Committee recommend that:

i) The Ministry should take up the matter with the Ministry of Finance on an urgent basis so as to ensure continued financial support for the ongoing and future Renewable Energy Projects in the event of NCEF being given to the States to indemnify them for their losses owing to GST.

ii) Alternatively, the Ministry should sincerely pursue for a separate fund dedicated to Renewable Energy Projects.

iii) The Ministry should also pursue with the GST Council for either excluding Renewables from GST Regime so as to ensure continuance of exemptions provided to goods used in renewable energy sector or imposing zero percent rate on Renewables, so that it does not result in increase in the cost of Renewable Energy.

Wind Energy

6. The Committee note that wind power potential in the country at the height of 100 meter above ground level has been estimated at 3,02,251 MW. Against this, a total capacity of 28871.59 MW has been reportedly installed as on January 31, 2017. The Committee are satisfied with the performance during the last two years, i.e. in 2014-15 and 2015-16, against the targets of 2000 MW and 2400 MW, wind energy capacities of 2312 MW and 3423 MW, respectively, have been achieved. However, the performance in 2016-17 is quite discouraging, i.e. against a target of 4000 MW, only 2094 MW capacity has been installed (as on January 31, 2017). The budget allocated in each of the three years i.e. 2014-15, 2015-16 and 2016-17, has been reportedly fully utilized. The Committee are informed that, for the year 2017-18, a physical target of 4000 MW has been set with a budgetary allocation of Rs.400 crore. The Committee note that in 2016-17, the Ministry have managed to achieve only 2094 MW against the target of 4000 MW with full utilization of Budgetary allocation of Rs.365 crore, so the Committee are apprehensive about achievement of the target set with the corresponding budgetary allocation for 2017-18 and feel that more funds should be made available for this sector. The Committee also note that the fiscal and financial incentives available include concessional custom duty and special additional duty, excise duty exemptions, income tax holiday, Accelerated Depreciation (AD) and Generation Based Incentive (GBI) for those who do not avail AD benefit. The Committee, therefore, recommend that:

i) The Ministry should approach the Ministry of Finance to allocate more funds at the time of Revised Estimates so as to ensure that implementation of the wind energy projects does not suffer due to shortage of funds.

ii) The Ministry should make concerted efforts to achieve the physical target of 4000 MW wind energy capacity for the year 2017-18 in a time bound manner.

iii) The Ministry should look into the reasons responsible for non-achievement of the physical target in 2016-17 and take corrective measures for the same.

iv) The Ministry should also give due publicity to the fiscal and financial incentives available to the industry.

7. The Committee are informed that so far the procurement of wind power in the country has been through Feed-In-Tariff and to bring competition in this sector bidding has been introduced and the Ministry are expected to streamline the bidding process at both Central as well as State level in 2017-18. The Committee welcome the initiative taken by the Ministry in this regard and feel that this will be helpful for the growth of the sector. However, the Committee are concerned about the delay in the finalization of the National Wind Energy Mission which has been a work under process for the last three years. The Committee therefore, recommend that:

i) The Ministry should come up with lucid guidelines for streamlining the Bidding Process in Wind Energy Sector in a time bound manner so as to bring in transparency and efficiency.

ii) The Ministry should complete the approval process with respect to the National Wind Energy Mission as soon as possible and the Committee may be apprised of the same.

Solar Energy

8. The Committee observe that the target under the National Solar Mission has been revised from 20,000 MW to 1,00,000 MW to be achieved by 2022. Against the estimated potential of 7,50,000 MW solar energy in the country, 9012.69 MW solar energy capacity has been commissioned/installed as on December 31, 2016. The Committee feel that the Ministry have a huge task before them to achieve 90,987.31 MW solar energy capacity to meet the ambitious target of 1,00,000 MW solar energy capacity by 2022. The Committee note that the Ministry have drawn up a detailed action plan to achieve the specified targets under the Mission. For the year 2017-18, a physical target of 10,000 MW for Grid-connected solar power has been set with an outlay of Rs.2661crore. The Committee are informed that the budget allocated will be sufficient to achieve the specified target set for 2017-18. However, the Committee are apprehensive about the achievement of the target set, as in 2016-17 the Ministry have been able to achieve only 2249.81 MW against the physical target of 12000 MW i.e. only 18.75% with utilization of ~Rs.1788 crore. The Committee find that the Ministry are far short of their target of 17000 MW cumulative solar capacity by March, 2017, as on December 31, 2016, the cumulative solar capacity in the country is only 9012.46 MW i.e. 47% short of the

stipulated target. The Committee are disappointed with the performance of the Ministry in this sector and feel that with this pace, the target of 1,00,000 MW by 2022 will be very difficult to achieve. The Committee, therefore, recommend that:

i) The Ministry should work on a mission mode so as to achieve the target of 10,000 MW set for the year 2017-18.

ii) The Ministry should play a proactive role in monitoring the progress of various solar energy projects.

iii) The Ministry should also ensure that implementation of the solar energy projects is not affected due to lack of adequate financial resources.

9. The Committee are informed that the Government has taken various steps to achieve 1,00,000 MW of solar energy by 2022 through fiscal and promotional incentives such as capital and/or interest subsidy, tax holiday, generation based incentive, accelerated depreciation, viability gap funding (VGF), concessional excise and custom duties, preferential tariff for power generation from Renewables, Foreign Direct Investment (FDI) upto 100% under automatic route, etc. The Committee are also informed that Solar tariff has come down from Rs.17.00 per unit in 2010 to Rs.4.34 per unit in Rajasthan in 2016 to Rs.3.30 per unit in Madhya Pradesh for Rewa Solar Power Plant, thus helping in promotion of solar power. However, the Committee feel that notwithstanding the promotional incentives and lowering of tariff, the results in this sector are not very encouraging. The Committee note that the Ministry is sure to miss the target of 17000 MW cumulative capacity by March, 2017 with a huge margin because of reported constraints such as delay in land acquisition, lack of evacuation infrastructure, non-conducive state policies, unwillingness of DISCOMs to purchase solar power, etc. The Committee feel that the reasons cited by the Ministry for non-achievement of cumulative target are generic and repetitive. The Committee, therefore, recommend that:

i) The Ministry should make sustained efforts to find solutions for the constraints being faced in the commissioning of Solar Projects in consultation with other agencies/Ministries concerned in a time bound manner.

ii) The Ministry should also make efforts to publicize the fiscal and financial incentives available for the promotion of this sector.

Biomass Power and Bagasse Co-generation Programme

10. The Committee find that the estimated potential for power generation from Biomass/Bagasse Co-generation in the country is around 25,000 MW, including 18,000 MW from agricultural and agro industrial residues and 7,000 MW from bagasse cogeneration in sugar mills. Against this, a cumulative capacity of 8025.00 MW has been reportedly installed upto December, 2016. The Committee note that the performance in this sector during the last three years has been fluctuating *viz*. in 2014-15 and 2015-16, against the targets of 400 MW each, capacities of 418.67 MW and 304.85 MW, respectively, have been achieved. However, the performance in 2016-17 is quite discouraging i.e. against the target of 400 MW, only 101 MW capacity have been installed. The fund allocated for the last three years were Rs.38 crore, Rs.29 crore and Rs.20 crore, respectively, which have not been fully utilized except in 2015-16. The Committee find that for the year 2017-18, a physical target of 350 MW has been fixed with an outlay of Rs.20 crore and the Committee are informed that the allocation will be sufficient to achieve the set target. That being so, the Committee are concerned that instead of striving to achieve their stipulated target, the Ministry have chosen to reduce it from 400 MW in 2016-17 to 350 MW in 2017-18, with budgetary allocation remaining the same. The Committee also note that besides the Financial Incentives, fiscal incentives such as concessional custom and excise duty, tax holiday for 10 years, 100% depreciation in the first year, etc. are available for Biomass power projects, still the targets remain unachieved. Hence, the Committee recommend that:

i) The Ministry should strive hard to ensure full achievement of the physical target for the year 2017-18, keeping in view the achievement of only one fourth of the target in 2016-17.

ii) More projects on Biomass/Bagasse Co-generation should be encouraged, especially in those States with potential like Karnataka, Maharashtra, Uttar Pradesh, Punjab, etc.

iii) Proper internal check system may be put in place to check non transparency in biomass energy projects of Sugar Mills.

iv) Promotional and awareness programmes for stakeholders like sugar mills owners, farmer associations and industry representatives should be intensively organized.

v) The Ministry should also undertake adequate publicity for the fiscal incentives and other benefits available to the industry.

vi) The technologies used in the sector should be upgraded and improved, keeping in mind the cost effectiveness.

Small Hydro Power

11. The Committee find that the estimated potential for power generation in the country from small hydro projects (upto 25 MW capacity) is around 21,135.24 MW from 7135 identified sites all over the country. Against this estimated potential, cumulative capacity of 4333.85 MW has been installed, with 864 MW under various stages of implementation. The Committee find the performance during 2014-15 and 2015-16 quite satisfactory. Against the target of 250 MW each, a capacity addition of 251.6 MW and 218.6 MW, respectively have been installed and the allocated funds during this period have also been fully utilized. However, the Committee are disappointed with the performance during the year 2016-17 wherein against the target of 150 MW, only 68.90 MW could be achieved as on January, 2017. Although, against the budgetary allocation of Rs.105.50 crore, Rs.104.99 crore have been utilized during the corresponding period. The Committee find that for the year 2017-18, the budgetary allocation has been increased to Rs.134.50 crore and physical target has been reduced to 100 MW as compared to budgetary allocation and physical targets of previous years. The Committee are apprised that there is a delay in completion of about 68 projects aggregating to 234 MW due to cost overrun, technical issues, difficult weather, natural calamities, etc. Taking note of the submission of the Ministry that under the National Mission on Small Hydro 5000 MW is proposed to be achieved by 2022, the Committee recommend that:

i) The Ministry should formulate new scheme for implementation of Small Hydro Projects on the basis of outcome of the evaluation study on SHP implemented during 12th five year plan so as to revamp the Small Hydro Projects in the country.

ii) Reassessment/confirmation i.e. marking of SHP sites on the ground should be taken up in a time bound manner.

iii) The Government may critically review its performance under the SHP sector and ensure that the factors which hindered the growth of the sector are addressed.

iv) The Ministry should also undertake adequate publicity for the incentives available to the industry.

Renewable Energy for Rural Applications

12. The Committee are informed that the Renewable Energy for Rural Applications include Bio-Gas Programme, Remote Village Electrification (RVE), Improved Cook-Stove Programme among others. The Committee are also informed that Remote Village Electrification (RVE) Scheme has been discontinued since 2014 and the same is now implemented by Ministry of Power and the funds have been kept only for catering to pending liabilities. The Committee note that during the years 2014-15 and 2015-16, the Ministry have failed to achieve their physical targets under Bio-Gas Programme and Improved Cook-Stove Programme despite full utilization of allocated funds. During the year 2016-17, against the Financial Allocation (RE) of Rs.165.50 crore, only Rs.72.03 crore (43.5%) have been utilized and against the physical target of 1 lakh Bio-Gas Plants, the Ministry have been able to set up only 36,000 such plants. Under Improved Cook stoves, the target during 2016-17 was 71,900, however, achievement is still awaited from States which shows apathy of the Ministry towards this programme. The Committee feel that the performance of the Ministry is discouraging in this sector specially with respect to Improved Cook-Stove Programme. The Committee note that for the year 2017-18, a budgetary allocation of Rs.135 crore has been made for Biogas plants and improved cook stoves programme with physical target of 1.1 lakh Bio Gas Plants. The Committee are, however, informed that no physical target has been set under Improved Cook Stoves Programme for 2017-18. Further, scrutiny of the data supplied by MNRE under biogas, improved Cook stoves and solar cookers during the last three years reveal a declining performances both in physical and financial terms. The Committee are informed that the non-achievement of biogas target is due to drought conditions during the last two years, high upfront cost of biogas plants, reduced subsidy support, lack of priority at state level, etc. The Committee find that apart from electricity generation and power saving, the application of these

technologies viz. biogas plants and improved cook stoves have benefitted millions of rural folk by meeting their cooking and other energy requirements in an environmentally benign way. The Committee, therefore, recommend that:

i) The Ministry should revisit the feasibility, affordability and availability of the technologies in the rural areas so as to provide for enhanced economic activities at village level ultimately improving the standard of living in remote areas of the country.

ii) The Ministry should strive hard to achieve their physical targets so as to provide clean energy solutions to the rural poor specially women and children through reduced consumption of fuel wood.

Renewable Energy for Urban, Industrial and Commercial Applications

13. The Committee note that the MNRE have been promoting the setting up of projects for recovery of energy from Urban, Industrial and Agricultural Waste/Residues to create conducive conditions with fiscal and financial regime to develop, demonstrate and disseminate utilization of waste for Energy. The other programmes under this head include i) Development of Solar Cities Programme, ii) Energy efficient solar/green buildings programme; iii) Waste to Energy Programme. On scrutiny of the data under the waste to energy programme, the Committee note that the target during the last three years i.e. 2014-15, 2015-16, 2016-17, was 25 MW against which about 40 MW has been achieved and against the financial allocation of Rs.61.5 lakh, about Rs.29.59 lakh were utilized during the corresponding period. However, the Committee find that out of the five pilot projects with the MNRE, only Okhla plant is operational and Ghazipur Plant is under commissioning and the remaining three projects could not be completed due to paucity of funds/technical reasons. The Committee note that for 2017-18, a budgetary allocation of Rs.30 crore with a physical target of 25 MW has been assigned for Waste to Energy Programme. The Committee have been apprised that the activities and management of Waste to Energy Sector is now under the Ministry of Urban Development. The Committee desire that the MNRE should play a proactive role in supplementing the programmes under the waste to energy programme. The Committee also note that for the year 2017-18, an outlay of Rs.14.20 crore have been allocated for the major schemes of the Ministry like promotion of solar cities, green building programmes demonstration

of renewable energy, etc. The Committee find that Rs.1.835 crore have been released during 2016-17 under Development of Solar Cities Programme and the funds could not be utilized due to non-availability of suitable proposals from States/Municipal Corporations. The Committee, therefore, recommend that:

i) In view of the importance of waste to energy programme, there should be an integrated strategy in managing the all activities under this programme so as to avoid delay in obtaining clearances/approvals from various agencies.

ii) In view of rapid urbanization, resulting in extensive construction activities, the Committee urge the Ministry to give due importance to the activities under energy efficient solar/green building programme, to facilitate promotion and development of solar cities and green buildings.

iii) The Ministry should encourage States/Municipal Corporations and other stakeholders to develop suitable proposals under Development of Solar Cities Programme.

iv) The Ministry should give enhanced publicity to the financial assistance available under this sector.

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

14. The Committee note that allocation under RDD&D for the years 2014-15 and 2016-17 was reduced at the RE stage i.e. in 2014-15 BE of Rs.149.50 crore was reduced to Rs.128.00 crore at RE and in 2016-17 BE was Rs.445.00 crore and RE was Rs.336.50 crore. It is found that even the reduced amount could not be fully utilized. However, the Committee are happy to note that during 2015-16, although a lesser amount of Rs.90 crore was allocated at the BE stage, it has been enhanced to Rs.106 crore at RE stage. Nonetheless, the actual expenditure was Rs.100.98 crore which is more than 95 percent of the R.E. Regarding the activities during the last three years, the Committee are informed that RD&D is being supported in the field of Solar Photovoltaic, Solar Thermal, Hydrogen fuel Cells and Wind-Solar Hybrid Systems. For the year 2017-18, the Committee note that an outlay of Rs.144.00 crore has been allocated under RDD&D which is way below the RE of Rs.336.50 crore for the year 2016-17. The Committee are apprehensive that due to reduced allocation for the current financial year, the R&D support for Renewable Energy Sector may suffer. The Committee also note an Action Plan

has been prepared by the MNRE for Solar Thermal, SPV, Biogas, Bio-fuel, Wind, Wind Hybrid, Hydrogen Fuel Cells and Small Hydro Projects for faster development of technologies in the Renewable Energy sector. The Committee, therefore recommend that:

i) The Ministry should pursue with the Ministry of Finance for additional funds at RE stage so that Research, Design, Demonstration and Development in New and Renewable Energy do not suffer due to lack of funds.

ii) The Ministry should ensure proper and efficient implementation of Action Plan in the fields of Solar Thermal, SPV, Biogas, Biofuel, Wind, Wind Hybrid, Hydrogen Fuel Cells and Small Hydro Projects for faster development of technologies in the Renewable Energy sector.

iii) The Ministry should ensure a coordinated approach for successful collaboration among the technological and R&D institutions and industries to achieve the goal of renewable energy technology development.

iv) The Ministry should also ensure constant monitoring of all the R&D projects with a view to evaluating their functioning in a cost effective and result-oriented manner.

15. The Committee note that the primary objective of the Research and Development activities is resource assessment, technology development, demonstration and commercialization for promoting large scale use of new and renewable energy. For manufacturing indigenous renewable energy devices and systems, new and renewable energy technologies, processes, materials, sub-systems, production devices and standards are to be supported and upgraded. The basic purpose of RDD&D is to make this sector competitive and renewable energy generation/supply profitable/self-sustainable. The Committee are of the considered view that the area of research, design and development in the renewable energy sector has not been given the required attention. Other areas of support in research, development and demonstration are solar, biogas, bio-fuel, hydrogen energy, fuel cells and SHP. If due thrust is given to these areas with sufficient funds and talent, the sector can be revolutionized. The Committee, therefore, recommend that:

i) Due attention should be paid to research, design, development and demonstration in the renewable energy sector with the backing of sufficient funds and talent.

ii) The objective of these activities should be to tap the huge potential in the areas of wind, solar and other renewable energy sources.

iii) The industry should become competitive with the indigenous manufacturing of renewable energy devices and systems.

NEW DELHI
March 09, 2017
Phalguna 18, 1938 (Saka)

DR. VIRENDRA KUMAR,
Chairperson,
Standing Committee on Energy

ANNEXURE-I

Year-wise allocation (BE/RE) and expenditure of the 12th Plan (upto 31.12.2016)
(Vide Para No.2.1 of the Report)

(Amount in Rs crore)

Resource/ Sector	**12th Plan Outlay**	**FY 2012-13**			**FY 2013-14**			**FY 2014-15**			**FY 2015-16**			**FY 2016-17**		
		BE	**RE**	**Exp.**	**BE**	**RE**	**Exp.**	**BE**	**RE**	**Exp.**	**BE**	**RE**	**Exp.**	**BE**	**RE**	**Expd. upto 31.12.2016**
Grid-Interactive & Distributed Renewable Power	13,690.00	825.00	759.00	748.73 (98.64%)	1,030.00	1218.66	1132.65 (92.94%)	2018.00	1845.00	1844.65 (99.98%)	2410.00	3902.00	3896.87 (99.87%)	3519.00	3076.70	2095.14 (68.10)
RE for Rural Applications	2,115.00	175.00	124.00	116.31 (93.79%)	150.00	113.29	109.21 (96.39%)	157.50	153.50	148.64 (96.83%)	160.00	109.21	102.91 (94.23%)	983.00	858.8	477.95 (55.65)
RE for Urban, Industrial and Commercial Applications	800.00	22.00	15.50	15.17 (97.87%)	21.00	10.10	10.00 (99%)	14.00	14.00	12.43 (88.79%)	4.62	4.62	4.62 (100%)	-	-	-
RD&D in RE	910.00	194.00	126.00	108.90 (86.42%)	160.00	148.50	136.97 (92.23%)	149.50	128.00	127.45 (99.57%)	90.00	106.00	100.98 (95.26%)	445.00	336.50	186.75 (55.50%)
Supporting Programmes	1,598.00	169.00	125.50	117.68 (93.76%)	160.00	248.13	230.20 (92.77%)	180.00	378.50	369.32 (97.57%)	123.05	124.70	123.97 (98.09%)	53.00	35.00	28.5 (81.43%)
Total Gross Budgetary Support (GBS)	**19,113.00**	**1,385.00**	**1150.00**	**1,106.79 (96.24%)**	**1,521.00**	**1738.68**	**1619.03 (93.11%)**	**2519.00**	**2519.00**	**2502.49** (99.34%)	**2787.67**	**4246.53**	**4229.45** (99.56%)	**5000.00**	**4307.00**	**2788.34 (64.74%)**

ANNEXURE-II

(Vide Para No.3.2 of the Report)

Details of the Budget Estimates for the year 2017-18 vis-à-vis BE/RE of 2016-17 and Actuals of 2015-16

मांग संख्या DEMAND NO. 67

नवीन तथा नवीकरणीय ऊर्जा मंत्रालय MINISTRY OF NEW AND RENEWABLE ENERGY

I. नवीन तथा नवीकरणीय ऊर्जा मंत्रालय के संबंध में 31 मार्च, 2018 को समाप्त होने वाले वर्ष में व्यय के लिये अपेक्षित धनराशि का अनुमान।

I. Estimates of the amount required in the year ending 31st March, 2018 to defray charges in respect of MINISTRY OF NEW AND RENEWABLE ENERGY

	राजस्व Revenue	पूंजी Capital	जोड़ Total
			(₹ करोड़) (In ₹ crores)
भारित Charged :	...	...	...
स्वीकृत Voted:	10724.54	90.00	10814.54

II. शीर्ष जिनके अन्तर्गत नवीन तथा नवीकरणीय ऊर्जा मंत्रालय की ओर से इस अनुदान का हिसाब दिखाया जाएगा।

II. The Heads under which this Grant will be accounted for on behalf of the MINISTRY OF NEW AND RENEWABLE ENERGY

		मुख्य शीर्ष Major Head	वास्तविक 2015-2016 Actuals	बजट अनुमान 2016-2017 Budget Estimates	संशोधित अनुमान 2016-2017 Revised Estimates	बजट अनुमान 2017-2018 Budget Estimates
राजस्व भाग	*REVENUE SECTION*					
सचिवालय- आर्थिक सेवाएं	Secretariat-Economic Services	3451	27.81	34.19	36.53	36.54
पूर्वोत्तर क्षेत्र	North Eastern Areas	2552	...	496.00	413.00	525.00
नवीन तथा नवीकरणीय ऊर्जा	New and Renewable Energy	2810	4084.20	9307.60	8067.60	10163.00
राज्य सरकारों को सहायता अनुदान	Grants-in-aid to State Governments	3601	38.25	45.00	...	...
जोड़ - राजस्व भाग	**Total-Revenue Section**		**4150.26**	**9882.79**	**8517.13**	**10724.54**
पूंजी भाग	*CAPITAL SECTION*					
नवीन तथा नवीकरणीय ऊर्जा पर पूंजी परिव्यय	Capital Outlay on New and Renewable Energy	4810	94.52	100.00	115.00	90.00
जोड़ - पूंजी भाग	**Total-Capital Section**		94.52	100.00	115.00	90.00
कुल जोड़	*GRAND TOTAL*		*4244.78*	*9982.79*	*8632.13*	*10814.54*

टिप्पणी: उपरोक्त अनुमानों में नीचे दिखाई गई वसूलियां शामिल नहीं हैं, जिन्हे व्यय में से घटा कर खातों में समायोजित कर दिया जाता है।

Note: The above estimates do not include the recoveries shown below which are adjusted in reduction of expenditure.

राजस्व भाग	*Revenue Section*					
नवीन तथा नवीकरणीय ऊर्जा	New and Renewable Energy	2810	-4018.76	-4802.00	-4172.00	-5231.70
राज्य सरकारों को सहायता अनुदान	Grants-in-aid to State Governments	3601	...	-45.00	...	...
जोड़ - राजस्व भाग	**Total-Revenue Section**		-4018.76	-4847.00	-4172.00	-5291.70
पूंजी भाग	*Capital Section*					
नवीन तथा नवीकरणीय ऊर्जा पर पूंजी परिव्यय	Capital Outlay on New and Renewable Energy	4810	...	-100.00	-100.00	-50.00
जोड़ - पूंजी भाग	**Total-Capital Section**		...	-100.00	-100.00	-50.00
जोड़ - वसूलियां	*Total Recoveries*		*-4018.76*	*-4947.00*	*-4272.00*	*-5341.70*
उपर्युक्त वसूलियों को घटा कर व्यय व्यवस्था इस प्रकार होगी:						
The expenditure provisions, net of above recoveries, will be as under:						
	राजस्व	Revenue	131.50	5035.79	4345.13	5432.84
	पूंजी	Capital	94.52	...	15.00	40.00
	जोड़	Total	226.02	5035.79	4360.13	5472.84

ANNEXURE –III

STANDING COMMITTEE ON ENERGY

MINUTES OF THE TWELFTH SITTING OF THE STANDING COMMITTEE ON ENERGY (2016-17) HELD ON 15th FEBRUARY, 2017, IN COMMITTEE ROOM 'G-074', PARLIAMENT LIBRARY BUILDING, NEW DELHI

The Committee met from 1400 hrs. to 1535 hrs.

PRESENT

LOK SABHA

Dr. Virendra Kumar - Chairperson

31. Shri Sultan Ahmed
32. Shri Om Birla
33. Shri Ashwini Kumar Chaubey
34. Dr. Arun Kumar
35. Shri Jagdambika Pal
36. Shri Ravindra Kumar Pandey
37. Shri M.B. Rajesh

RAJYA SABHA

38. Shri T.K.S. Elangovan
39. Shri Oscar Fernandes
40. Shri La Ganesan
41. Shri Shamsher Singh Manhas
42. Dr. Anil Kumar Sahani

SECRETARIAT

1. Shri S.C. Chaudhary - Joint Secretary
2. Shri N.K. Pandey - Director
3. Smt. L. Nemjalhing Haokip - Under Secretary

Witnesses

MINISTRY OF NEW AND RENEWABLE ENERGY

1.	Shri Rajeev Kapoor	Secretary
2.	Shri J.B. Mohapatra	JS & FA
3.	Shri Santosh D. Vaidya	Joint Secretary
4.	Ms Anjani Nandan Sharan	Joint Secretary
5.	Ms. Sutapa Majumdar	Economic Advisor
6.	Shri Dilip Nigam	Scientist - G
7.	Shri P.C. Maithani	Scientist - G
8.	Dr. Ashwini Kumar	GM (SECI)
9.	Dr. S.K. Bhargava	Director (Finance), IREDA
10.	Dr. P.C. Pant	Scientist - F
11.	Shri Jeewan kumar Jethani	Scientist - D
12.	Ms. Seema	Director

2. At the outset, the Chairperson welcomed the Members of the Committee and the representatives of the Ministry of New and Renewable Energy to the sitting and informed that the sitting had been called to discuss the 'Demands for Grants of the Ministry for the year 2017-18'.Also, the Hon'ble Chairperson apprised them of the agenda and focus area for the discussion and the provisions of Directions 55(1) and 58 of the Directions by the Speaker.

3. During the discussion, the Joint Secretary, MNRE, made a power-point presentation on the subject "Examination of Demands for Grants of the Ministry of New and Renewable Energy for 2017-18" which, *inter-alia,* covered Budgetary Allocation *vis-a-vis* Expenditure, Renewable Power : Cumulative Installed Capacity (MW), Application of Budget : 2016-17, Progress in Wind Sector, Wind Policies in States, Biomass Sector, Small Hydro Sector, Yearly SHP Capacity Addition, Growth of Solar Sector, Initiatives for Market Development, Atal Jyoti Yojana, Performance of SECI, Performance of IREDA, Renewable Energy by 2022 & Progress, etc.

4. The Secretary, Ministry of New and Renewable Energy, briefed the Committee on the Demands for Grants for the year 2017-18 and the budgetary allocation *vis-a-vis*

actual expenditure of the last three years. Thereafter, he apprised the Committee that during the Twelfth Plan, the target for the first four years was 16.68 GW and the target for the entire period of five years was 30 GW of additional capacity. The Committee was also apprised that in the first four years, the achievement was 17.96 GW, but in June 2015, the target was revised to 175 GW of Renewable Energy capacity to be achieved by 2022. The Secretary submitted before the Committee that keeping in view the revised target, there would be some shortfall, particularly in solar capacity addition; however, the results have started showing which would show in terms of achievement in the coming years.

5. The Secretary also submitted before the Committee that the Ministry had been facing following challenges:

a) requirement of a very large chunk of land to the tune of 1,80,000 hectares.
b) lack of sufficient fund availability.
c) uncertainty over fund allocation from NCEF due to GST.
d) making Renewable Energy tariff affordable.

6. The Committee, *inter-alia,* deliberated upon the following points with the representatives of the Ministry of New and Renewable Energy:

(i) Achievements *vis-a-vis* targets under various programmes during 2016-17;
(ii) Financial requirement and allocation for 2017-18 *vis-à-vis* physical targets;
(iii) Performance and various issues relating to Solar, Wind, Small Hydro etc.
(iv) Mission mode implementation of Renewable Energy Projects in order to achieve 175 GW of Renewable Energy by 2022.
(v) Need to address impact of GST on National Clean Energy Fund.
(vi) Need for Renewable Energy Projects to be zero rated under GST.
(vii) Need for a dedicated Green Tax/Renewable Tax for Renewable Energy Projects.
(viii) Need to continue with tax holiday for Renewable Energy Projects beyond 31st March, 2017, in consultation with the Finance Ministry.
(ix) Need to ensure durability and quality of solar energy equipment.

(x) Need to emulate the tariff model of Rewa Solar Power Plant, Madhya Pradesh where Rs.3.30 per unit levelised tariff over next 25 years has been realised.

(xi) Need for a Inter- Ministerial Task Force for better coordination so as to achieve the stipulated target in a time bound manner.

(xii) Clarity in policies and regulations.

7. Thereafter, 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 Ministry of New and Renewable Energy to furnish written replies to those queries which could not be readily responded to by them. The Committee felt that the Ministry should play a proactive role for the advancement of the sector so as to meet the target of 175 GW of Renewable Energy by 2022.

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

The Committee then adjourned.

ANNEXURE - IV

MINUTES OF THE THIRTEENTH SITTING OF THE STANDING COMMITTEE ON ENERGY (2016-17) HELD ON 2nd MARCH, 2017 IN COMMITTEE ROOM '62', PARLIAMENT HOUSE, NEW DELHI

The Committee met from 1100 hrs. to 1120 hrs.

PRESENT

LOK SABHA

Dr. Virendra Kumar - Chairperson

2. Shri Om Birla
3. Shri M. Chandrakasi
4. Shri Ashwini Kumar Chaubey
5. Shri Bhagat Singh Koshyari
6. Kunwar Sarvesh Kumar
7. Dr. Arun Kumar
8. Shri R.P. Marutharajaa
9. Shri Ravindra Kumar Pandey
10. Shri M.B. Rajesh
11. Shri Conrad Kongkal Sangma
12. Shri Devendra Singh alias Bhole Singh
13. Shri Bhanu Pratap Singh Verma

RAJYA SABHA

14. Shri Oscar Fernandes
15. Shri La Ganesan
16. Shri S. Muthukaruppan
17. Shri Javed Ali Khan
18. Dr. Anil Kumar Sahani
19. Smt. Viplove Thakur

SECRETARIAT

1.	Shri A.K. Singh	Additional Secretary
2.	Shri S.C. Chaudhary	Joint Secretary
3.	Shri N.K. Pandey	Director

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

i) Demands for Grants of the Ministry of Power for the year 2017-18.

ii) Demands for Grants of the Ministry of New and Renewable Energy for the year 2017-18.

3. After discussing the contents of the Reports in detail, the Committee adopted the aforementioned draft Reports. The draft Report on 'Demands for Grants of the Ministry of Power for the year 2017-18' was adopted with a minor modification and the draft Report on 'Demands for Grants of the Ministry of New and Renewable Energy for the year 2017-18' was adopted without any change. The Committee also authorized the Chairperson to finalize the above-mentioned Reports and present the same to both the Houses of Parliament in the second part of the Budget Session.

4. x x x x x x x x x x x x.

The Committee then adjourned.

x - not related to this Report.