39

STANDING COMMITTEE ON ENERGY

(2017-18)

SIXTEENTH LOK SABHA

MINISTRY OF NEW AND RENEWABLE ENERGY

DEMANDS FOR GRANTS
(2018-19)

THIRTY NINTH REPORT

LOK SABHA SECRETARIAT
NEW DELHI

March, 2018/Phalguna, 1939 (Saka)

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Presented to Lok Sabha on 13.03.2018

Laid in Rajya Sabha on 13.03.2018

LOK SABHA SECRETARIAT
NEW DELHI

March, 2018/Phalguna,1939 (Saka)

COE NO. 298

Price: Rs.....

Published under Rule 382 of the Rules of Procedure and Conduct of Business in Lok Sabha (Fifteenth Edition) and Printed by_____.

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1.	Shri A.K. Singh	Additional Secretary
2.	Shri N.K. Pandey	Director
3.	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 Thirty Ninth Report on 'Demands for Grants of the Ministry of New and Renewable Energy for the year 2018-19'.

2. The Committee took evidence of the representatives of the Ministry of New and Renewable Energy on 15th February, 2018. 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 (2018-19).

3. The Report was considered and adopted by the Committee at their sitting held on 9th March, 2018.

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

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

NEW DELHI
March 09, 2018
Phalguna 18, 1939 (Saka)

DR. KAMBHAMPATI HARI BABU
Chairperson,
Standing Committee on Energy

REPORT

PART I

NARRATION ANALYSIS

CHAPTER I

INTRODUCTORY

1.1 Renewable Energy has started playing an increasingly important role for augmentation of grid power, providing energy access, reducing consumption of fossil fuels and helping India pursue its low carbon developmental pathway. India's Intended Nationally Determined Contribution (INDC) builds on its goal to increase the country's share of non-fossil-based installed electric capacity to 40 percent by 2030. The INDC also commits to reduce India's GHG emissions intensity per unit GDP by 33 to 35 percent below 2005 levels by 2030, and to create an additional carbon sink of 2.5 to 3 billion tonnes of carbon dioxide through additional tree cover.

1.2 Over the years India has successfully created a positive outlook necessary to promote investment in, demand for and supply of renewable energy. In addition to grid power, decentralized distributed electrification using renewable energy technologies provides economical options for meeting lighting, cooking and productive energy needs in rural areas.

1.3 The Government has embarked upon an ambitious mission of achieving 175 GW by laying great emphasis on the natural resources like solar, wind, hydro, etc. The Ministry has been implementing a wide range of schemes with fiscal and financial support and conducive policies to achieve this target. A capacity of 62.84 GW has been set up by December 2017 and this constitutes 18 per cent of the total installed capacity. Given below is the share of RE capacity in total installed capacity (as on 31.12.2017):

SOURCE	INSTALLED CAPACITY (GW)	% SHARE
RENEWABLE ENERGY	62.84	18.84
LARGE HYDRO	44.96	13.48
NUCLEAR	6.78	2.03
THERMAL	218.95	65.65
TOTAL	**333.53**	**100.00**

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 major functions of the Ministry include the following:

- Putting in place suitable policy and regulatory framework at the national and State levels for growth of new and renewable energy sector.
- 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.
- Promoting Human Resource Development in the new and renewable energy sector.
- Fostering international cooperation in new and renewable energy sector.
- Information, Publicity, Public Awareness creation in the Renewable Energy (RE) sector.
- Supporting related Research & Development (R&D) activities / projects taken up by institutions and industry.
- Undertaking resource assessment and potential estimation studies for all new and renewable sources of energy.

CHAPTER II

REVIEW OF PAST PERFORMANCE OF THE MINISTRY OF NEW AND RENEWABLE ENERGY

I. BUDGET ALLOCATION AND UTILIZATION

2.1 The details of the year-wise allocation (BE/RE) along with expenditure for the last three years (upto 31.01.2018) are given as under:

(Rs. in Crore)

	2015-16			2016-17			2017-18		
	BE	**RE**	**Actual Exp.**	**BE**	**RE**	**Actual Exp.**	**BE**	**RE**	**Actual Exp.** (as on 31.1.2018)
GBS+ NCEF	2787.67	4246.53	4229.45	5000.00	4307.00	3871.32	5472.84	4080.00	2875.48
IEBR	3373.06	5430.93	6112.69	9192.83	12301.52	7913.44	8243.73	9465.70	8343.21
Total	6160.73	9677.46	10342.14	14192.83	16608.52	11784.76	13716.57	13545.70	11218.69

2.2 When asked about the reasons for major variations in the BE/RE and actual expenditure during last three years, the Ministry of New and Renewable Energy stated:

> "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 (Rs. 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, 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 crores through IREDA for implementation of MNRE programmes against which Rs 1640 Cr of GOI fully serviced bonds were raised. This led to increase in IEBR at RE stage. Reduction in RE of GBS was compensated through this additional funding.
>
> During 2017-18, the reported expenditure as on 31.01.2018 was Rs 2875.48 Cr which is about 70% of RE and Ministry is likely to achieve full expenditure by end of financial year."

2.3 Quarter - wise utilization of Budget allocations during the last three years are as given below:

FY	BE	RE	Actual exp.	Quarter (% of RE)			Cumulative
				1st	2nd	3rd	
2015-16	2787.67	4246.53	4229.45	25%	23%	15%	63%
2016-17	5000	4307	3871.32	35%	19%	11%	65%
2017-18	5472.84	4080.00	2872.16 (As on 31.12.2017)	23%	28%	19%	70%

2.4 When asked about the reasons for such uneven expenditure in each quarter and if the quarterly expenditure during these years was as per the plan and norms, the Ministry stated:

> "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."

2.5 In response to a query regarding Programme Head wise utilization of funds during the year 2017-18, the Ministry stated that as on 31st January 2018, over all expenditure was over 70.48 % of RE and that they have been making concerted efforts for utilization of RE in full. Programme head wise details are as under:

Programme Head	Exp. as % of RE
Grid Interactive Renewable Power	74.65
Off-Grid/Distributed and Decentralised Renewable Power	61.94
Research, Development and International Co-operation	54.05
Autonomous Bodies	85.87
Total	**70.48**

2.6 When asked about the Heads which could not get the required amount leading to non- achievement of the targets, the Ministry stated:

> "The funds for Grid Interactive head are inadequate. Additional funds of around 695 Cr. are being raised through GoI fully serviced bonds through IREDA for funding various Grid interactive programs."

II PHYSICAL TARGETS AND ACHIEVEMENTS

2.7 In response to a query about the physical achievement *vis-a-vis* targets during 2015-16, 2016-17 and 2017-18, the Ministry furnished:

PHYSICAL TARGETS AND ACHIEVEMENT DURING 2015-16, 2016-17 and 2017-18							
S. No.	Programme / system	2015-16		2016-17		2017-18	
		Target	Ach.	Target	Ach.	Target	Ach. (as on 31.12.2017)
GRID POWER (Capacities in MW)							
1	Wind Power	2400.00	3423.05	4000	5502.37	4000	568.71
2	Small Hydro	250.00	218.60	250	105.9	200	38.3
3	Bio Power	400.00	304.85	400	161.95	350	232.1
4	Waste to Power (Indstl./Urban)	10.00	0.00	10	7.50	5	0
5	Solar Power	1400.00	3018.88	12000	5525.98	10000	4763.54
OFF – GRID/DECENTRALISED POWER (Capacities in MWeq)							
6	Waste to Power	10	14.13	15	5.57	20	7.62
7	Biomass (Non-bag Cogen)	60	60.04	60	1.20	60	9.50
8	Biomass Gasifiers(Rural)	8	12.54	10	2.80	7.5	0.92
9	SPV Systems	50	87.67	100	155.50	150	104.42
OTHER RE SYSTEMS							
10	Family type Biogas Plants (No. in Lakh)	1.1	0.74	1	0.58	1.1	0.22

2.8 Detailing about the achievements of the Ministry, the Secretary, MNRE during the Evidence, deposed before the Committee:

> "The Ministry of New and Renewable Energy has a target of installing a capacity of 175GW through renewable sources by the year 2022. If I split, out of this 175 GW, 100 GW has to come from solar, 60 GW from wind, 10 GW from biomass and 5 GW from small hydro. As against the target set, out of 100 GW of solar capacity, we have achieved as of today 18.5 GW. We hope to achieve 20 GW by 31st March, 2018. In wind sector against the target of 60 GW, we have already achieved 32.8 GW. In biomass against the capacity of 10 GW we have achieved 8.53 GW. In small hydro we have achieved 4.4 GW against the total target of 5 GW. So, as on today, we have got 62.5 GW capacity already installed and we sincerely hope that by the end of 31st March, we would have an installed capacity of 68 GW."

2.9 Further explaining the future course of action so as to achieve the given target, the Secretary submitted:

> "We have given a trajectory to all stakeholders that how we want to achieve 175 GW. If we have to achieve 175 GW by the year 2022, we must complete our bidding by March 2020 giving clear two years for the implementation of the programme. We would bring out bids according to the

trajectory by March 2020. I assure the house that we would continue with our programme which has been announced."

III. FINANCIAL SUPPORT FROM NATIONAL CLEAN ENERGY FUND (NCEF)

2.10 From the financial year 2011-12 to 2016-17, an amount of Rs. 17,086.24 crore was allocated to MNRE from NCEF. For the year 2017-18, a Budget Estimate of Rs. 5,341.7 crore has been allocated to MNRE from NCEF. From the year 2018-19, there will be no allocation from NCEF to MNRE. However, this deficit is likely to be made up by allocation under Gross Budgetary Support.

2.11 The details of allocation from NCEF during the last three years i.e. 2015-16, 2016-17 and 2017-18 are as under:

Year	Allocation from NCEF to MNRE (Rs. in Crore)
2015-16	3,989.83
2016-17	4,272.00
2017-18	5,341.70

2.12 When queried about the Renewable Energy Projects that have been recommended for NCEF support, the Ministry stated:

> "From the year 2011-12 till date, the Inter-Ministerial Group (IMG), in consultation with the Ministries proposing the project, after examining the suitability as per the guidelines, has recommended 52 Renewable Energy Projects with a total Viability Gap Funding (VGF) of Rs. 34,503.79 crore."

IV EXTERNAL FINANCIAL ASSISTANCE

2.13 Currently three Externally Aided Projects are being implemented by the Ministry.

a) UNDP/GEF supported Project on "Scale Up of Access to Clean Energy for Rural Productive Uses".

b) Department for International Aid, UK (DFID) assisted Project on Energy Access Policy Fund (EAPF).

c) UNDP–GEF Project - Market development of concentrating solar technologies for industrial process heat applications.

These externally aided projects supplement efforts of the Ministry in addressing some specific technology and socio economic issues.

2.14 On being asked about the details regarding the status of the project "Scale Up of Access to Clean Energy for Rural Productive Uses" including assistance received and utilized, the Ministry furnished:

"Project Outlay : USD 14.8 m (Rs.96.2 Cr)

Details of Funding and Expenditure as on 31st September, 2017 is as under:

S. No.	Name of Agency	Total Contribution	Expenditure as on 31.09.2017
i	GEF	USD 4.00 million (Rs.26.00 Cr)	UNDP/GEF - Rs.1.64 Cr
ii	UNDP	USD 0.80 million (Rs.5.20 Cr)	
iii	GoI/MNRE	USD 10 million (Rs.65.00 Cr)	GoI/MNRE - Rs.0.03 Cr

The key objective of the Project is to enhance the use of clean energy for rural productive uses/livelihoods in un-served and under-served areas in the selected districts of 3 states - Assam, Odisha and Madhya Pradesh for strengthening livelihoods, improving income generation and reducing use of fossil fuel.

7 livelihood sectors identified under the project are - horticulture, dairy, poultry, fisheries, handicrafts (bamboo/weaving) and other rural micro enterprises. The main activities under the project are:

i) development and deployment of cost- effective Renewable Energy Technology Packages for Rural Livelihoods (RETPRLs);
ii) establishment of supply chain infrastructure;
iii) Providing Support in development of Policy and Regulatory Support for RE - Rural Livelihoods Applications; and
iv) Assess and Improve effectiveness of Financial Support Models for Decentralized RE – Rural Livelihoods Applications.

Physical Progress during 2017

- **Project Scheme for Scale-up of Access to Clean Energy –** Project scheme for implementing and utilization of the Ministry contribution towards project fund has been recommended for approval by the Standing Finance Committee (SFC) headed by Secretary, MNRE. The approval of the scheme is under process.

- **State Level Meetings with Stakeholders and development of project proposals –** State level meetings were organized in coordination with UNDP and respective State Nodal Agencies (SNAs) and State Rural Livelihood Missions (SRLMs) of the 3 target states; Assam, Madhya Pradesh and Odisha in order to gauge the requirement of various Renewable Energy Technology (RET) Packages for different rural livelihood sectors. Visits to respective SNAs and SRLMs in (a) Guwahati, Assam, (b) Bhopal, Madhya Pradesh and (c) Bhubaneswar, Odisha were conducted by Project Management Unit (PMU), MNRE and UNDP officials for development of proposals for installation of Solar Pumps for horticulture activity.

- **Benchmark Technical Specifications & Costs, Testing Procedures for different RETPRLs –** Meetings with officials from National Institute of Solar Energy (NISE), Gurgaon, PMU, MNRE and UNDP were conducted regarding development of benchmark technical specifications & costs and development & formalization of testing procedures for different Renewable Energy Technology Packages for Rural Livelihoods (RETPRLs).
- **Audio-Visual Tutorials/Clips for different RETPRLs –** Audio Visual (AV) Tutorials/Clips for 25 different RETPRLs covering various RE technologies and rural livelihood applications were developed. Each AV Tutorial is about 4 minutes long and is developed in English as well as local languages of the 3 target states viz; Assamese, Hindi and Odiya. One long AV Tutorial is also developed in all languages which is a combination of all the 25 AV Tutorials.
- A document is developed covering the various RETPRLs worked over in the 25 AV Tutorials.
- Organized 1 meeting of Project Steering Committee (PSC) and 6 meetings of Project Executive Committee (PEC)."

2.15 In response to a query about the details regarding the status of the project on "Energy Access Policy Fund (EAPF)" including assistance received and utilized, the Ministry furnished:

"Project Outlay : Rs. 6.70 Cr

Details of Funding and Expenditure as on 31st Dec. 2016 is as under :

S. No.	Name of Agency	Contribution
i	DFID	£ 500,000 (Rs. 4.20 Cr)
ii	GoI/MNRE	Rs. 2.50 Cr

The key objective of the project is to support development of Energy Access Policy Framework and Financing Instruments for Off-grid solutions. As per DPR approved by DEA, 50% of the total DFID technical assistance is to be utilized for setting up pilot projects or for supplying of RE products in rural areas of 2 states –Odisha and Jharkhand. GoI/MNRE's contribution is for implementation of pilot projects in the field.

Activities initiated under the project are as follows: -

i) **Power Up Odisha** - The aim of the study is to develop a vision document for Odisha's energy system in 2030 with an action plan to achieve the vision through policy strengthening and is being carried out by Forum for the Future.

ii) **Knowledge Portal on Energy Access** - The objective is to develop an online platform to access information on Energy Access, showcase success stories and benchmark products and services. The portal has been developed by IPE Global and is awaiting security audit by NIC.

iii) **Establishment of Pilot Project based on Smart Nano-Grid for Rural Energy Access -** A Smart Nano Power Plant of 40 kW capacity has been set up in Chhotkei Village, Angul Distt. of Odisha by Sun Moksha and National Institute of Science and Technology (NIST) which aims to provide quality power to unelectrified villages. A residential workshop to educate government officials of various states was organized in May 2016 to motivate them to replicate in their respective states. In order to test robustness and scale up the model, it was decided to set up 2 more pilot projects – 1 each in Odisha and Jharkhand for which scoping study is being carried out by PwC and Sun Moksha."

2.16 When asked about the details regarding the status of the project on "Market development of concentrating solar technologies for industrial process heat applications" including assistance received and utilized, the Ministry furnished:

"Status on Expenditure

- Total GEF support : USD 4.40 Million (Rs. 28.00 crore appx.)
- Expenditure till 31.12.2017 : USD 4.40. Million
- Balance : Nil

Implementing Agency : Ministry of New & Renewable Energy, GOI
Date of Start: 28 March, 2012
Duration : 5 years
Closing date of the project: 31.12.2017- extended by 9 months with accounts also to be closed by this date
Objective : The major objective of the project has been to develop the market of CSH systems through public awareness, removing barriers and developing required knowledge documents for various types of stakeholder.
Major Outputs Envisaged : 60,000 sq. m. of CST based systems (45,000 through GEF support & 15,000 with no GEF support) installed through 30 Demonstration & 60 Replication projects resulting to 39,200 tonnes of reduction in GHG CO2 emission & saving of 3.15 million liters of fuel oil saved per year besides developing knowledge documents, test set ups & National standards.
Expenditure procedure
A separate account has been opened in SBI, Scope Complex for the funds drawn from UNDP from time to time for expenditure in the project. IREDA is the fund handling agency. Till 31.12.2015, the funds were being directly drawn from UNDP, based on the Annual Work Plan (AWP) drawn and placed in the bank with SoE submitted to UNDP on quarterly basis. From 1.1.2016 onwards, the fund flow arrangement has been changed as per the directions of DEA. A budget head has been created in Demand for Grant and an amount of Rs. 6 crore has been earmarked for 2017-18. Now the funds are first drawn from MNRE budget head with the concurrence of IFD and the expenditure then incurred from the funds is get reimbursed to CAAA from UNDP. All the expenditure made from MNRE budget till December 2017 has got reimbursed from UNDP to CAAA. Nothing is under process.

MNRE Budget & Expenditure

Allocated budget in MNRE Demand for Grant (2016-17 & 2017-18)	Rs. 1200 lakhs
Amount drawn	Rs. 1197 lakhs
Expenditure incurred & got reimbursed from UNDP to CAAA	Rs. 1145 lakhs
Balance in project Account including interest accrued	Rs. 65 lakhs appx. (To be returned to MNRE after closing of account by IREDA). Letter sent.

Present Status

- As per the requirement of GEF final evaluation of the project was undertaken by UNDP during 26 November-3rd December by appointing an independent team of 2 experts; one National and the other International. Draft report has been submitted.
- Final audit of the project for year 2017 was conducted by UNDP during mid of December.
- Process for transfer/ disposal of assets created in the project has been completed.
- All GEF money has been consumed with no money left. Project ended on 31.12.2017. PMU to be closed on 15.1.2018."

V EFFECT OF GST ON RENEWABLE ENERGY SECTOR

2.17 The Ministry stated that the Goods and Services Tax (Compensation to States) Act, 2017 which has been notified in April 2017, provides that coal cess, along with some other cess would constitute GST Compensation Fund and the same would be utilized to compensate the States for five years for potential losses on account of GST implementation. After five years any amount left would be shared on 50% basis between Centre and States. During the year 2018-19 the budgetary allocation is from gross budgetary support. No funds have been made available through NCEF. It is expected that adequate funds would be provided under the regular budget head through GBS. The Ministry will arrange additional financial resources, if need be, through:

- GoI serviced/Masala Bonds
- Multilateral/bi lateral financial organizations.

2.18 On being asked about the effects of GST on Renewable Energy Sector, the Ministry stated as under:

"As per the notified GST rates, 'Renewable energy devices and spare parts for their manufacture', both under Chapter 84 (Mechanical Devices) and Chapter 85 (Electrical Devices), have been kept in 5% GST slab as follows:

Renewable energy devices and spare parts for their manufacture	**GST Rate**
a. Bio-gas plant b. Solar power based devices c. Solar power generating system d. Wind mills and wind operated electricity generator e. Waste to energy plants/ devices f. Solar lantern/ solar lamp g. Ocean waves/tidal waves energy devices/plants h. Photo voltaic cells, whether or not assembled in modules or made up into panels	**5%**

However, in the implementation of the above, a lot of confusion is prevailing and considerable difficulties are being experienced in the field on account of following issues:

(a) Issue of applicable rate of GST on final product - 5% OR 18%

i. A Solar Power Generating System is not a "Good" bought and sold in the market. It emerges after "Supply and Erection of Components" at a site. Thus, there are apprehensions that the Applicable Rate of Tax would actually be 18% under "Works Contract ", rather than the intended 5%.

ii. Further, if the Solar Power Developer himself is an EPC Contractor aggregating the components to build his Solar Power Plant then, since his Final Product is "Electricity", which is outside GST, he will certainly not get the benefit of 5% GST on Solar Power Generating System. In that case, each component will attract its standard rate (5, 12, 18 or 28 %) and the same will remain as cost of the Project.

(b) Issue of applicable rate of tax on components/parts - 5% OR 5, 12, 18, 28%

The words, "spare parts for their manufacture", in the above-mentioned GST Schedule, are leading to confusion with regard to the applicable rate of GST on components used in a Solar Power Plant, especially if such items do not , normally, have another usage, eg. Solar Inverters.

(c) Issue of refund of input tax credit leading to higher working capital requirement

The Ministry has requested the Ministry of Finance to issue necessary clarification and modification in this regard."

VI GREEN ENERGY CORRIDOR

2.19 In its Annual Report (2017-18), the Ministry has stated that in order to facilitate integration of large scale renewable generation capacity addition, the Cabinet Committee of Economic Affairs (CCEA) in Financial Year 2015-16 approved creation of Intra-state Transmission System in the states of Andhra Pradesh, Gujarat, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Tamil Nadu where large capacity renewable power projects are planned, at an estimated cost of Rs.10,141.68 crore with Government of India contribution from National Clean Energy Fund (NCEF) of Rs. 4056.67 crore. The project is scheduled to be completed by Financial Year 2019-20 with funding mechanism consisting of 40% NCEF Grant, 40% KfW loan (EUR 500 Million) and the remaining 20 percent as State contribution. The creation of the Intra-State Transmission System will facilitate the evacuation of renewable power from generation stations to load centres.

2.20 On a query regarding the status of Green Energy Corridor, the Ministry stated:

"The status of Inter-State Transmission System is as follows:

1. The following transmission lines have been commissioned up to 31st December 2017:

- Ajmer (New)- Ajmer (RVPN) 400kV D/c (Quad) -131 Ckm
- Chittorgarh (New)- Chittorgarh (RVPN) 400kV D/c (Quad) - 97 Ckm
- Chittorgarh – Ajmer(New) 765kV D/c - 422Ckm

2. The following sub stations have been commissioned up to 31st December 2017:

- 2x1500 MVA, 765/400kV S/s at Chittorgarh
- 2x1500 MVA, 765/400kV S/s at Ajmer (New)

The total transmission lines target is 3200 ckm and substations target is 18000 MVA. Other lines and substations are under implementation and the complete project is scheduled to be commissioned by June 2019.

The status of Intra-State Transmission System is as follows:

The total transmission lines target is 8500 ckm and substations target is 19000 MVA. The lines and substations are under implementation and the complete project is scheduled to be commissioned by March 2020.

As on 31.12.2017, out of the total 85 packages (estimated cost is Rs. 10141 crores), Tendering has been done for 62 packages (for Rs. 7479 crore) and 48 packages have been awarded (for Rs. 6766 crore as per DPR cost); 7 packages have been cancelled by Rajasthan. The works related to installation

of transmission towers and its stringing for aggregate 1100 ckt-kms have been completed (commissioning is pending):

- **Andhra Pradesh**: 400kV Quad Moose DC line from 400 kV Uravakonda Substation to 400kV Hindupur Substation.
- **Tamil Nadu**: (i) Rasipalayam - Palavadi 400 kV transmission line and (ii) 230 KV Transmission lines: Kayathar 400 kV Substation – Tuticorin Auto D/C line, Veeranam-Tirunelveli (PGCIL) Substation S/C line, Veeranam-Kodikurichi S/C line, Ingur- Arasur 400 kV Substation (PGCIL) S/C line, Arasur 400 kV Substation (PGCIL) – Gobi Substation S/C line and Cuddalore-SP Koil (Veerapuram) D/C line.
- **Karnataka**: 400kV LILO line with twin Moose ACSR conductor from 400kV Guttur-Guddadahalli S/C line to 400/220kV Substation at Gadag (Doni).
- **Gujarat**: (i) LILO of both circuits of 220 KV D/C Jamanvada – Varsana line at 220 KV Bhachunda M/C line and (ii) 220 KV D/C Radhanpur – Sankhari line."

CHAPTER III

DEMANDS FOR GRANTS OF THE MINISTRY FOR 2018-19

3.1 The Ministry of New and Renewable Energy presented Demand No. 67 to the Parliament for the financial year 2018-19 on 8th February, 2018. 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	5106.23	40.40	5146.63

3.2 A statement showing the details of the Budget Estimates for the year 2018-19 *vis-à-vis* that of Budget Estimates/Revised Estimates (BE/RE) of 2017-18 and Actuals of 2016-17 are given at ***Annexure-I.***

3.3 The Plan Outlay of the Ministry of New and Renewable Energy (MNRE) during the year 2017-18 and for the year 2018-19 as furnished by the Ministry is given below:

(Rs. in crore)

Components of Plan Outlay of MNRE	2017 -18		2018-19
	BE	RE	BE
Budgetary Support	5,472.84*	4080.00*	5146.63**
IEBR	8243.73	9465.70	10316.84
Total	**13716.57**	**13545.70**	**15463.47**

* National Clean Energy Fund ** Gross Budgetary support

3.4 On a query regarding the allocations sought by the Ministry of New and Renewable Energy for the year 2018-19 and the amount actually sanctioned by the Ministry of Finance, the Ministry stated:

> "An allocation of Rs. 5843.96 crores was sought for the year 2018-19. Rs. 5146.63 crores have been sanctioned by Ministry of Finance (scheme component plus non-scheme component) for the year 2018-19."

3.5 When asked about the reasons for hike/reduction in Central Plan Outlay for the year 2018-19 as compared to the last year, the Ministry stated:

"For the year 2018-19, there is a short fall of about Rs 326.21 Crore (5.96%) in the Central Plan Outlay as compared to the year 2017-18 vis-à-vis BE 2017-18 and an increase of Rs. 1066.63 Cr (26.14 %) vis-à-vis RE 2017-18. Actual requirement projected was Rs 5843.96 Cr against which an allocation of Rs. 5146.63 Cr has been made."

3.6 When asked if the allocation made for the year 2018-19 will be sufficient to meet the requirement to achieve the physical targets, the Ministry stated:

"Some additional funds will be required which will be assessed and sought at the RE stage."

3.7 Given below is the Head-Wise Allocation for the Schemes of Ministry of New & Renewable Energy for 2017-18 and 2018-19:

Head	BE (2017-18) (Rs. in crores)	RE (2017-18) (Rs. in crores)	Actual Exp. 2017-18 (Rs. in crores)	BE (2018-19) (Rs. in crores)
Grid Interactive Renewable power	4034.50	2627.00	1961.07	3762.50
Off-Grid/Distributed and Decentralized Renewable power	918.20	1125.00	696.46	1036.50
Research & Development	144.00	81.00	43.78	94.00
Supporting Programmes, support to Institutions/PSUs, Secretariat expenses, etc.	376.14	247.00	174.17	253.63
Total	**5472.84**	**4080.00**	**2875.48** (up to Jan, 2018)	**5146.63**

3.8 On being asked about the Financial Allocations & Physical Targets for 2018-19, the Ministry furnished the following:

Grid Interactive Renewable power	BE (Rs. in crores)	Physical Target
Wind Power	750	4000 MW
Hydro power	207	250 MW
Bio Power	25	370 MW*
Solar power	2045.25	11000 MW
Green energy Corridors	600	3000 cKm (cumulative)
Off-Grid/Distributed and Decentralized Renewable power	**BE (Rs. in crores)**	**Physical Target**
Wind Power	7.50**	-
Hydro power	11.50	500 No. of water mills

Bio Power	23.00	370 MW
Solar power	848.50	Solar PV- 200 MWp & CST- 20 MWeq
Biogas Programme	135.00	One lakh biogas plants

* Including Off grid bio power

** Small wind energy & hybrid systems program is being discontinued from this financial year. The budget is required for clearing pending liabilities only.

CHAPTER IV

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

4.1 According to the Ministry's report, India has renewable energy potential such as wind, solar, biomass, small hydro etc. As per NIWE estimates, India has a wind potential of more than 300 GW at a hub height of 100 meter, solar potential of ~750 GW assuming 3% wasteland is made available and small hydro potential of ~20 GW. The bio energy potential has been estimated at 25 GW. Further, there exists significant potential from decentralized distributed applications for meeting hot water requirement for residential, commercial and industrial sector through solar energy and also meeting cooking energy needs in the rural areas through biogas. Renewable energy has great capacity to usher in universal energy access. In a decentralized or standalone way renewable energy is quite appropriate, scalable and viable solution for providing power to un-electrified or power deficient villages and hamlets. In December 2017, the cumulative renewable power installed capacity was 60.98 GW. Of this 27 GW renewable power installed capacity was added from April 2014 to December 2017.

4.2 An allocation of Rs. 3762.50 crore for the Grid Interactive Renewable and Rs. 1036.50 crore for off-Grid/Distributed and Decentralized Renewable Power have been made for the year 2018-19.

4.3 When asked about the details of financial utilization vis-à-vis allocation during the last three years under Grid-interactive and Off-Grid Renewable Power, the Ministry furnished as given below:

Year	BE	RE	Actual (Rs. in Crore)
2015-16	2410	3902	3896.87
2016-17	4402	3899.15	3514.08
2017-18	4952.70	3752	2657.53 (As on 31.01.2018)

4.4 Given below is the Renewable Energy Capacity addition in 2017-18 (as on 31.12.2017) as furnished by the Ministry:

Achievement in grid connected renewable power		
	Achievement (MW) (April - December, 2017)	**Cumulative Achievements (MW) (as on 31.12.2017)**
Wind Power	568.71	32848.46
Solar Power - Ground Mounted	4492.05	16070.07
Solar Power - Roof Top	271.49	982.30
Small Hydro Power	38.30	4418.15
BioPower (Biomass & Gasification and Bagasse Cogeneration)	232.10	8413.80
Waste to Power	0.00	114.08
Total	**5602.65**	**62846.86**

4.5 The Ministry was in the process of reviewing all its major programmes i.e. Solar, Wind, Small Hydro and Bio Power programmes. When asked about the outcome of this review process, the Ministry stated:

"After comprehensive review, following modifications have been carried out:-

- Solar Power: Target of solar park scheme was increased from 20 GW to 40 GW.
- Wind Power: Bidding Process has been started instead of GBI scheme.
- Independent Evaluation of Small Hydro power and Bio power program has been carried out. As per recommendations, new programs are being developed.
- EFC for small hydro power program has been completed. Cabinet note for CCEA's approval is under process.
- SFC for Biomass cogeneration program is scheduled in Feb, 2018.
- A detailed trajectory for bidding so as to achieve the 175 GW target has been prepared and made public."

I. WIND ENERGY

4.6 India is the fourth largest wind power producer in the world, after China, USA and Germany. Ministry's wind power programme covers wind resources assessment, projects through fiscal and promotional policies. A total capacity of 32848.46 MW has been established up to December, 2017.

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

State	Total (MW)
Andaman & Nicobar	8
Andhra Pradesh	44229
Chhattisgarh	77
Goa	1
Gujarat	84431
Karnataka	55857
Kerala	1700
Lakshadweep	8
Madhya Pradesh	10484
Maharashtra	45394
Odisha	3093
Puducherry	153
Rajasthan	18770
Tamil Nadu	33800
Telangana	4244
West Bengal	2
Total in MW	**302251**
Total in GW	**302**

4.8 Given below are the State-wise installed Wind Power Capacity as on 31.12.2017, as furnished by the Ministry:

STATE	Cumulative capacity
Andhra Pradesh	3834.75
Gujarat	5537.37
Karnataka	3793.1
Kerala	51.5
Madhya Pradesh	2497.79
Maharashtra	4777.63
Rajasthan	4281.72
Tamil Nadu	7969.5
Telangana	100.8
Others	4.3
Total	**32848.46**

4.9 On being asked about Wind power capacity addition targets and achievements for the last three years i.e. 2015-16, 2016-17 and 2017-18, the Ministry furnished:

Year	Wind power capacity addition in MW	
	Target	Achievements
2015-16	2400	3423
2016-17	4000	5502
2017-18	4000	597.91 (as on Jan, 2018)
Total	10400	9522.91

4.10 On a query about the fund utilization *vis-à-vis* allocation during the previous years, the Ministry furnished:

Year	Budgetary allocation vis-à-vis utilization (Rs. in crore)	
	budgetary allocation	utilization
2014-15	566	100%
2015-16	314	100%
2016-17	488.95	100%
2017-18	400	100%
Total	1768.95	100%

4.11 Regarding physical target and financial allocation for the year 2018-19, the Committee were informed that a target of 4000 MW wind power capacity addition has been set for the year 2018-19 and corresponding budgetary allocation is Rs. 750 crore.

4.12 When the Committee desired to know if the allocation would be sufficient to meet the physical target set, the Ministry stated that Rs. 750 Crore has been allotted for the year 2018-19 towards GBI claims. The amount is for past liability for GBI Scheme which has been discontinued from 1st April, 2017.

4.13 On being asked about the major activities/projects proposed to be undertaken by the Ministry during 2018-19, the Ministry stated :

> "A cumulative bid size of about 10000 MW of wind power is likely to be invited during the financial year 2018-19."

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

> "The Government is promoting wind power projects through private sector investment by providing fiscal and financial incentives such as Accelerated Depreciation benefit; concessional custom duty exemption on certain components of wind electric generators etc. In addition, Generation Based Incentive (GBI) Scheme is available for the projects commissioned before 31st March 2017 and 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."

4.15 Regarding Manufacturing Base in Wind Energy Sector, it is stated that there are 21 manufactures in Wind Energy and models upto a capacity of 3 MW single turbine, are being manufactured. The current annual production capacity of

domestic wind turbine industry is around 10,000 MW. The indigenization of wind turbine manufacturing has reached up-to 70% and cost of Indian wind turbines is among lowest in the world.

4.16 Regarding harnessing of Off-Shore Wind Resources and Wind – Solar Hybrid, the Secretary, MNRE deposed:

> "We are now trying to exploit the off shore wind resources also. We plan to do between 5-10 GW by the year 2022. We are also coming out with a scheme of harnessing combined wind-solar hybrid. First 160 MW solar-wind hybrid park is coming up in Andhra Pradesh. So, with these figures, we are not only confident of achieving 175 GW but we are confident that we would be exceeding the target set for the Ministry."

II. SOLAR ENERGY

4.17 When the Committee asked about the estimated potential and the installed capacity of solar energy, the Ministry has stated that India is endowed with vast solar energy potential. About 5,000 trillion kWh per year energy is incident over India's land area with most parts receiving 3-5 kWh per sq. m per day. 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 31.01.2018) as furnished by the Ministry are given as follows:

Sl. No.	State	Solar Power Potential (GWp)	Total Cumulative Solar capacity installed (In MW)
1.	Andhra Pradesh	38.44	2170.32
2.	Arunachal Pradesh	8.65	4.39
3.	Assam	13.76	12.45
4.	Bihar	11.20	142.45
5.	Chhattisgarh	18.27	185.03
6.	Delhi	2.05	69.52
7.	Goa	0.88	0.91
8.	Gujarat	35.77	1585.85
9.	Haryana	4.56	215.85
10.	Himachal Pradesh	33.84	2.23
11.	Jammu & Kashmir	111.05	2.36
12.	Jharkhand	18.18	25.60
13.	Karnataka	24.70	2788.62
14.	Kerala	6.11	107.93
15.	Madhya Pradesh	61.66	1237.41

16.	Maharashtra	64.32	772.33
17.	Manipur	10.63	1.33
18.	Meghalaya	5.86	0.06
19.	Mizoram	9.09	0.20
20.	Nagaland	7.29	0.50
21.	Odisha	25.78	79.57
22.	Punjab	2.81	913.16
23.	Rajasthan	142.31	2311.81
24.	Sikkim	4.94	0.01
25.	Tamil Nadu	17.67	1822.57
26.	Telangana	20.41	3048.41
27.	Tripura	2.08	5.09
28.	Uttar Pradesh	22.83	551.15
29.	Uttarakhand	16.80	294.08
30.	West Bengal	6.26	48.52
31.	UTs	0.79	55.26
Total		**748.98**	**18454.97**

4.18 On being asked about the Action Plan of the Ministry to harness the available potential of Solar Energy, the Ministry stated that the Government has planned to achieve 100 GW target through solar energy by 2022. Against this target, grid connected solar capacity of 18,455 MW has been installed as on 31.01.2018. The trajectory for bidding of solar power projects has been finalized with year-wise details as under:

Year	**Total tenders planned (In MW)**
2017-18	20,000 (11161 MW already bid out)
2018-19	30,000
2019-20	30,000

4.19 When queried about the steps taken to achieve the ambitious target of 100 GW solar power by the year 2022, the Ministry stated that the Government is promoting solar energy through fiscal and promotional incentives such as capital and/or interest subsidy, generation based incentive, accelerated depreciation, viability gap funding (VGF), financing solar rooftop systems as part of home loan, concessional excise and custom duties, and Foreign Direct Investment (FDI) up to 100 per cent under the automatic route etc. This apart, Government has also been supporting solar manufacturing through a Modified Special Incentive Package Scheme (M-SIPS) of Ministry of Electronics & Information Technology (MeitY). The

Government has launched various schemes to achieve the target with the details as given below:

- "Solar Park Scheme for setting up of over 50 Solar Parks and Ultra Mega Solar Power Projects targeting over 40,000 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 Viability Gap Funding (VGF).
- Scheme for setting up 300 MW of Grid-Connected Solar PV Power Projects by Defense Establishments and Para Military Forces with VGF.
- Pilot-cum-demonstration projects 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 National Thermal Power Corporation (NTPC) Ltd./National Vidyut Vyapar Nigam (NVVN).
- VGF Schemes for setting up of Grid Connected Solar PV Power Projects through Solar Energy Corporation of India (SECI).
- Installation of Grid Connected Solar Rooftop Power Plants."

4.20 When the Committee desired to know about the installed Grid connected solar capacity, the Ministry furnished :

S. No	Year	Capacity added during the year (MW)	Cumulative capacity (MW)
1	2011-12	994 MW	1030 MW
2	2012-13	656 MW	1686 MW
3	2013-14	945.9 MW	2631.9 MW
4	2014-15	1112.07 MW	3743.97 MW
5	2015-16	3018.883 MW	6762.853 MW
6	2016-17	5525.98 MW	12288.83 MW
7	2017-18	6166.15 MW	18454.97 MW (As on 31.01.2018)

4.21 When asked if the financial demand of the Solar Sector has been aggregated with a view to arrange the finances for the sector, the Ministry stated:

"Keeping in view the normative cost of Rs. 5 crore per MW, the total investment for commissioning of 100 GW solar power has been estimated to Rs. 5 lakh crore. Most of the investment for projects comes from Private sector and Ministry is providing a facilitative role in land acquisition, loan at affordable rates, 100% FDI in RE sector through automatic route etc. Further many issues of land acquisition, power evacuation, transmission etc. have been sorted out through scheme for development of solar parks and Ultra mega solar power projects for setting up of 40,000 MW solar projects. In addition, Government has arranged a World Bank loan of US $ 100 million for

creating internal infrastructure of solar parks. Getting finance has not been a major issue so far."

4.22 On being asked about the status of funds sanctioned/released and spent for the development of Solar Energy with specific reference to insufficiency or otherwise, the Ministry stated that a budget of Rs. 2259 Crore and Rs. 956 crore was earmarked at BE and RE stage respectively for the year 2017-18 for Grid connected solar projects. Out of this, funds of Rs. 951.93 Crore have been utilized so far. Availability of finance is not an issue. Ministry has also planned to utilize the funds raised through green energy bonds by IREDA.

4.23 When the Committee asked about the actual financial expenditure *vis-à-vis* allocation w.r.t. the Solar Mission, the Ministry furnished:

"The details of funds allocated and the expenditure incurred on installation of grid connected large scale ground mounted solar power projects and roof top projects are as under:

(Rs. in Crore)

Year	Funds allocated (BE stage)	Funds allocated (RE stage)	Funds released
2014-15	750.00	391.50	391.50
2015-16	1066.00	1716.00	1715.99
2016-17	2138.00	2020.02	1992.32
2017-18	2259.00	1117.00	951.93 (as on 31.12.2017)

Ministry has made its best efforts to release the funds allocated. There is some shortfall on account of non-receipt of project proposals complete in all respect as per scheme guidelines."

4.24 When inquired about the challenges envisaged by the Ministry in achieving the target of 100 GW solar power by the year 2022, the Ministry stated:

"Since the country still does not have enough manufacturing capacity currently for cells and modules to cover full demand, both imported and indigenous solar equipments and components are being utilized for achieving the targets. In addition, major challenge is to get the land acquired and power transmission system."

4.25 When asked about the present status regarding Large ground mounted projects, the Ministry stated that against the target of 60000 MW, as on 31.01.2018, 17383 MW of ground mounted projects has been installed. There are

projects of around 9000 MW in pipeline. In addition, tenders of 11161 MW have been floated in 2017-18 and tenders of another 11000 MW are to be issued by March 2018. During 2018-19 and 2019-20 tenders of 30000 MW each have been planned.

4.26 Regarding the status of Solar Parks, the Secretary, MNRE, during the evidence, deposed:

> "As regards solar parks, we had initial scheme of about 20,000 MW which we will install in various States. But then we augmented the scheme to 40,000 MW. As against the target of 40,000 MW, we have received proposal only for 21,000 MW. We have not been able to get much of interest from the State Governments and mainly it is due to non-availability of land. Land is not available with the State Governments for the solar parks. Considering this and considering the smaller sizes of the land in mountaineering States, earlier we used to have solar parks of around 500 MW but now we have agreed to reduce the sizes of solar parks to upto 50 MW and in special cases even up to 20 MW. So, we are going to revise this scheme and we want more and more solar parks to come in all the States."

4.27 The Ministry furnished the following major challenges in achieving the targets regarding Large ground mounted projects:

- "availability of conducive State policy for solar;
- availability of land;
- Power evacuation system
- affordable cost of financing; and
- Conducive business environment such as willingness of DISCOMS to purchase the solar power, power evacuation infrastructure etc."

4.28 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:

> "In 2014, an assessment on potential SPV capacity in India was undertaken by the National Institute of Solar Energy (NISE). This study estimated a rooftop SPV potential of 42.8 GW."

4.29 When asked about the progress made so far in the Rooftop Solar Programme, the Ministry furnished:

> "Government of India has set the target of installing 40,000 MW of Rooftop Solar (RTS) Power by the year 2022. The year wise targets (in MW) are as follows:

2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	Total
200	4800	5000	6000	7000	8000	9000	40000

Accordingly, as per the CCEA approval, Ministry of New and Renewable Energy (MNRE) is implementing Grid Connected Rooftop and Small Solar Power Plants Programme for developing 4200 MW of RTS power. Out of 4200 MW capacity, 2100 MW capacity has to be installed through CFA/ incentive in the residential, social, Government / PSU and Institutional sectors. The balance 2100 MW is to be implemented without any CFA in the industrial and commercial sectors. As on 31.12.2017, MNRE has sanctioned projects of cumulative capacity of 1810 MWp under the programme to various State Nodal Agencies (SNAS)/SECI/Public Sector Undertakings/ DISCOMs /Govt. Departments etc. About 953 MW of RTS capacities have been reported as installed including subsidized and non- subsidized projects as on 06.02.2018.

The year-wise cumulative installation details as reported are as follows:

Up to 31.03.2015	Upto 31.03.2016	Upto 31.03.2017	Upto 06.02.2018
41MW	241MW	656 MW	953 MW

4.30 In response to a query regarding the reasons for slow progress of Rooftop Solar Programme, the Ministry stated:

a) "Involvement of multiple approval process (e.g. connectivity, net metering, Chief electrical Inspector to Government (CEIG) inspection, limitation in sanctioned load/DT capacity etc.)
b) Reluctance of DISCOM to operationalize net-metering regulations to operationalize net-metering regulations as RTS systems may reduce their income from higher paying customers
c) Skill and knowledge gaps
d) Withdrawal of subsidy/CFA in private industrial and commercial sector
e) Non-uniformity of Power Purchase Agreement (PPA) and Engineering, Procurement and Construction (EPC) agreements
f) Slow progress of Implementing agencies
g) Multiple tenders for RTS projects
h) Lack of consumer awareness
i) Non-uniform regulations across states
j) Tedious process for project commissioning and subsidy disbursement
k) Frequent changes in Govt. Policies
l) Lack of policies addressing grid connected rooftop solar (RTS) by States (only 20 States has notified)."

4.31 Further explaining the reasons for slow progress of Roof-top Solar Programme, the Secretary, during the evidence, deposed:

> "We are revising the roof top solar. In roof top solar, we are lagging behind the target. The main reason is that the discoms are not willing to let go the high-end consumers because if the high-end consumers go, then they would be left with only those people whom they subsidize. Secondly, there have been challenges on the net metering side. There have been challenges on the side of inspection by the Chief Electrical Officer. We are revising the scheme and we are taking State Governments on board so that we can give new impetus to the roof top solar programme. So, this exercise is currently going on. One meeting has already been held under the chairmanship of hon. Minister. Second meeting is going to take place within next 10 days and we would come out with a new scheme. But I am sure that we will be achieving the target set for roof top solar of 40 GW by year 2022."

4.32 Elaborating the remedial measures being contemplated for promotion of Roof-top Projects, the Ministry furnished:

a) "MNRE has pursued all States/ UT Governments and their SERC/ JERC for issue of Gross / Net metering regulations as these are key regulatory support for RTS segment. By now, all the 36 States/ UTs have notified such regulations and/or tariff orders.
b) MNRE has developed Scheme Guide, Best Practices Guide and the Compendium on Policies and Regulations for ready reference of all States/ UTs.
c) MNRE pursued all States/ UTs to make RTS compulsory on new buildings by making changes in building byelaws. Thus 4 State/ UTs of Chhattisgarh, Haryana, Uttar Pradesh and Chandigarh have notified such mandates.
d) As financial CFA has been withdrawn for projects in Industrial & Commercial sectors, MNRE made efforts to provide concessional loans to developers in these segments. Thus multilateral concessional loans of about USD 1375 Million (Approx. 9316 crore) have been approved from the World Bank, Asian Development Bank and New Development Bank to State Bank of India (SBI), Punjab National Bank (PNB) and Canara Bank respectively for RTS financing .
e) To support Ministries/ Departments, CPSUs have been empaneled for undertaking project management consultancy (PMC) and for ensuring cost efficiencies through collation of RTS projects. As per direction of the CoS, MNRE also prepared model EPC agreement / PPA which have been duly vetted by Ministry of Finance and Ministry of Law and Justice.
f) MNRE has also pursued all Ministries/ Departments to proactively pursue RTS projects. Thus 35 Ministries/ Departments have submitted Commitment Certificates (about 3890 MW capacity) for solar power development.

g) Based on the experience so far, the Ministry is revisiting its roof top policy. A concept note for the same had been prepared and hosted on the website for getting comments and suggestions on the same. Based on the comments received, a new rooftop policy would be put in place."

4.33 On being asked if any assessment has been done with regard to the cost of roof top Solar, the Ministry stated:

"The benchmark cost for grid connected rooftop solar projects has been arrived with based on cost details received from different implementing agencies including State Nodal Agencies, Solar Energy Corporation of India etc. The present benchmark cost is as follows:

- 1-10 kW: Rs. 70 per watt
- above 10kW to 100kW : Rs. 65 per watt
- above 100kW to 500 kW: Rs. 60 per watt"

4.34 The Ministry furnished that the roof top are remunerative and the average payback period of such projects varies from 5-6 years and the expected life is upto 25 years.

4.35 Regarding the Off-Grid Solar Programme, the Ministry, during the Evidence, furnished that under Off-grid Solar Programme, 600 MWp has been installed till date and in third phase, from 2017-18 to 2019-20 , an additional 598 MWp capacity is proposed to be installed. Given below is Application-wise units installed:

Systems (SPV Off-grid Systems)	**Number of units (as on 31.12.2017)**
Solar Lanterns/Study lamp	23,28,865
Home Lights	14,77,189
Street Lights	4,71,220
Solar Power Plant	182 MWp
Solar Pumps	1,47,527

4.36 Explaining the proposed Off- Grid Solar Power Programme, the Ministry furnished:

"Following sub-components are proposed for the period 2017-20:

- Solar Home lighting systems for individuals- 3 Lakhs
- Solar Street Light- 3 Lakhs
- Solar Water Pumping- 1.5 lakhs
- Stand-alone Solar Power Plants- 100 MWp
- Solar Study Lamps- 25 lakhs"

4.37 Regarding the newly introduced KUSUM Scheme (Kisan Urja Suraksha evam Utthaan Mahabhiyan), the Ministry furnished that the total capacity of 28,250 MW has been envisaged under the scheme which has following four components:

> "Component A : 10,000 MW of Decentralized Ground Mounted Grid Connected Solar Power Plants of intermediate capacity of 0.5 – 2 MW; Total capacity 10000 MW.
>
> Component B : Installation of 17.50 lakh standalone Solar Powered Agriculture Pumps of capacity upto 7.5 HP; Aggregate capacity of 8250 MW
>
> Component C : Solarisation of 10 Lakh Grid-connected Powered Agriculture Pumps with support of upto 5 HP capacity; Aggregate capacity of 7500 MW owned by farmers; Sale of surplus power to the Grid
>
> Component D : Solarisation of 50,000 Grid-connected tube-wells/lift irrigation and drinking water projects of upto 50 HP operated by State Government Departments; Aggregate capacity of 2500 MW."

4.38 Further explaining the new initiative regarding Solar Power Pumps, the Secretary, during the evidence, deposed:

> "We are now trying to empower the farmers by giving grid connected solar power pumps. An announcement to this effect has been made in the budget speech. We plan to give solar power pumps of double the capacity of what the farmers earlier used so that they can supply the excess power to the grid and earn an additional income. This new scheme will have following advantages. Firstly, the farmer will be able to have power for his captive use. Secondly, he will be able to earn additional income by supplying power to the grid. Thirdly, this scheme will help in de-dieselisation of the farm sector. Fourthly, it will help in conserving water because then the farmer would be more interested in selling the power than taking the water from the ground. Lastly, the discoms will not then be passing on subsidy to the farmer. The subsidy to the farmer would stop and thereby the power charges what we are giving now would also come down. So, this will have multi-dimensional advantages."

4.39 On being asked about the mechanism adopted by the Ministry to ensure the quality of material being used in solar projects, the Ministry stated:

> "In August 2017, Ministry of New & Renewable Energy has notified Guidelines for Tariff Based Competitive Bidding Process for Procurement of Power from Grid Connected Solar PV Power Projects, which clearly specifies the Technical Requirements for Grid Connected Solar PV Power Plants, thereby ensuring the quality of material/ equipment being used in solar PV projects.

In order to ensure quality of material/ equipment being used in solar PV projects, MNRE, on 05.09.2017, has brought out a Quality Control Order titled "Solar Photovoltaics, systems, Devices and Components Goods (Requirement for Compulsory Registration) Order 2017". MNRE is preparing for its implementation by making test labs ready for testing and certification."

4.40 Regarding status of Domestic Manufacturing in the Solar Sector, the Ministry furnished:

"As regards, manufacturing of solar cells and solar modules, manufacturers have reported that a capacity of 3164 MW and 8398 MW has been installed for solar cells and solar modules respectively in the country. However, as the domestic manufacturers are not competitive at present, they are not able to get enough orders to exploit their entire capacity."

4.41 When asked about the challenges being faced in Domestic Manufacturing in the Solar Sector, the Ministry stated:

a) "The country does not have a manufacturing base for Poly-silicon, Ingots/wafers, the upstream stages of solar PV manufacturing chain, which is a very energy intensive process.
b) Lack of integrated set up, economies of scale & modern technology resulting in higher cost of production.
c) Price of solar equipment produced in the country is not competitive as compared to that of foreign manufacturers, especially Chinese manufacturers.
d) The domestic manufactures have to borrow at higher interest rates, compared to foreign manufacturers, pushing up their cost of production.
e) Since the assured market available to domestic manufacturers is limited, they are not able to set up larger plants, making them lose on economies of scales.
f) Present assured schemes under Domestic Content requirement (DCR) schemes are not enough to be able to meet existing manufacturing capacity.
g) As per industry's views, some of the reasons for poor manufacturing capacity are high cost of land/ electricity, low capacity utilization, high cost of financing, and lack of skilled workforce."

4.42 Regarding recent imposition of 'Duties' on import of Solar Panels, the Secretary, during the evidence, explained:

"First issue is regarding the customs duty. Customs duty earlier used to come under 8541 and all solar panels were coming with zero per cent customs duty because this is under the international agreement. Of late, the Ministry of Finance has started levying duty at the rate of 7.5 per cent. The Ministry of New and Renewable Energy is of the opinion that under the

international agreement, solar modules should attract only zero per cent duty and not 7.5 per cent duty. So, we have taken up this issue with the Ministry of Finance. To give more substance to my argument, the solar modules we export are also under 8541. So, it cannot happen that we import under 8501 and export under 8541. So the solar panels should be imported under 8541. The logic says that it has to be under 8541 and this clarification has to come because this is creating unnecessary problem in the sector. There is a lot of uncertainty in the sector. So, this has to be clarified at the earliest possible. Coming to the anti-dumping and safeguard duty, the safeguard duty has been recommended by the DG (Safeguards) to the tune of 70 per cent. We are of the opinion that anti-dumping duty and safeguard duty should not be of the tune which derails our own programme. If anti-dumping duty or safeguard duty comes into force, it should not affect the bids which have already taken place. It should only come from the prospective effect and for the bids which have not yet been finalized. Otherwise, the people who have bid today, they would be at a disadvantage. So, this is the stand which the Ministry has taken."

4.43 When asked about the companies involved in solar sector that are reporting loss in their venture and the tariff structure of such loss making companies, the Ministry stated that it has not received any such specific case till date. The Ministry also stated:

> "The tariff structure cannot be elucidated for want of report from any company. As all this information remains with project developers, no definite data can be elaborated in this regard. In addition, the data of private companies are not maintained by the Ministry about their financial health."

4.44 In a rush to build market share in the sector, some players have become very aggressive in competitive auction process and are bidding very low tariff. There is a fear that some of these projects would become unviable because developers may find it difficult to raise funds and contain high project costs. On being asked about the details of prices of solar power per unit quoted during last 2 years and the reasons for such steep decline in the cost of solar power, the Ministry stated:

> "The biddings are held in open and transparent manner and it also depends upon market forces. The bids are given by the bidders based on their assessment of the costs and competition involved. As all this information remains with project developers, no definite reason can be correctly attributed. Further, reduction in solar power tariffs depend upon several factors like solar irradiance, cost of capital, logistics, Internal Rate of Return (IRR), guaranteed off-take and conducive government policies for promotion of solar energy and it is up to the project developers to bid for the projects keeping in view various factors and viability of projects."

The details of solar power tariffs discovered through bidding during last two years, as furnished by the Ministry, are given at ***Annexure II***.

4.45 On being asked about the status of actual implementation of the Net-Metering in the country, the Ministry stated:

> "Although all the 36 State/Joint Electricity Regulatory Commission has issued net metering regulation/tariff orders but various DISCOMs have diverse views. The revenue erosion due to adoption of solar by high electricity tariff paying customer, availability of solar power during day time when there is less electricity demand by users and non-availability of solar power during peak demand time (say in evening) etc. are some of the concerns of the DISCOMs. From the users point of view, the main concern are the availability of net meters, time taken for net metering connections by DISCOMs, inspection by Chief Electrical Inspectors to Government (CEIG) Inspection etc."

4.46 The details of the Subsidies/support in terms of Central Financial Assistance (CFA) given by the Government for installation of Solar Projects, as furnished by the Ministry, are given at ***Annexure III***.

4.47 When asked about the physical target and financial allocation for Solar Energy for the year 2018-19, the Committee were informed:

> "A target of 11,000 MW grid connected solar power capacity installation has been planned for 2018-19. Funds of Rs. 2045.25 Crore have been allocated at BE stage for grid connected solar power projects for the year 2018-19."

4.48 On being asked if the budgetary allocation will be sufficient to achieve the physical target set for the year 2018-19, the Ministry stated:

> "Availability of finance is not an issue, as most of the investment is met by the private solar developers. Ministry is playing a facilitator role in respect of major schemes like solar park scheme and VGF schemes."

III. BIOMASS POWER AND BAGASSE CO-GENERATION PROGRAMME

4.49 The Ministry has been promoting "Biomass Power and Bagasse Co-generation Programme" with the aim to recover energy from biomass including bagasse, agricultural 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 GW. 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 around 7 GW. Thus the total estimated potential for biomass power is about 25 GW.

4.50 Reportedly over 500 biomass power and cogeneration projects with aggregate capacity of 8414 MW have been installed in the country upto December 2017.

4.51 State –wise Potential for Biomass/Bagasse Co-generation power, as furnished by the Ministry, is given below:

Sr. No.	**State**	**Power Potential (MW)**	
		Biomass	**Bagasse**
1	Punjab	3177.6	160
2	Maharashtra	1969.7	2200
3	Uttar Pradesh	1764.9	2000
4	Madhya Pradesh	1386.2	
5	Haryana	1375.1	100
6	Gujarat	1226.1	50
7	Karnataka	1222.1	1400
8	Tamil Nadu	1163.9	700
9	Rajasthan	1121.9	10
10	Kerala	864.4	
11	Andhra Pradesh	738.3	250
12	Bihar	645.9	200
13	West Bengal	529.2	
14	Orissa	432.7	
15	Assam	278.7	
16	Chhattisgarh	245.6	10
17	Himachal Pradesh	142.2	
18	Jharkhand	107.0	
19	Uttarakhand	88.3	80
20	Jammu & Kashmir	42.7	
21	Goa	26.1	
22	Manipur	15.3	
23	Meghalaya	11.4	
24	Nagaland	10.2	
25	Arunachal	9.3	
26	Tripura	3.0	
27	Sikkim	2.4	
28	Mizoram	1.2	
29	Telangana		100
Total		**18601.5**	**7260**

4.52 When asked about the State-wise installed capacity of Biomass/Bagasse Co-generation power (as on 31.12.2017), the Ministry furnished :

State	Cumulative (in MW)
Andhra Pradesh	378.2
Bihar	113
Chhattisgarh	228
Gujarat	65.3
Haryana	121.4
Karnataka	1604.6
Madhya Pradesh	93
Maharashtra	2065
Telangana	158.1
Punjab	194
Rajasthan	119.3
Tamilnadu	893
Uttarakhand	73
Uttar Pradesh	1957.5
West Bengal	300
Odisha	50.4
Total	**8414**

4.53 When asked about the physical achievements *vis-à-vis* targets under Biomass Power/Bagasse Cogeneration Programme during the previous years, the Ministry furnished:

Year	Target (MW)	Achievement (MW)
2015-16	400	305
2016-17	400	162
2017-18	340	253 (upto Jan, 2018)

4.54 Regarding reasons for non-achievement of the physical targets, the Ministry stated that the Biomass Power/Bagasse Cogeneration sector is facing problems such as non-signing of PPAs by DISCOMs, lack of working capital and non-availability of biomass. These issues are affecting the progress of the sector.

4.55 On a query regarding the budgetary allocation *vis-à-vis* utilization for the last three years under Biomass Power/Bagasse Cogeneration Programme, the Ministry stated:

Year	Allocation (R.E.) (in Crores)	Utilization (in Crores)
2015-16	30	29.00
2016-17	17	10.30
2017-18	9	2.27* (up to 31.01.2018)

* Likely to be utilized 100 % by 31.03.2018.

4.56 When asked about the reasons for non-utilization of funds in the previous years, the Ministry stated:

"Not receiving the complete documents from FIs in time is resulting in non-utilization of funds."

4.57 Regarding physical targets and budgetary allocation for the year 2018-19, the Ministry stated:

Physical Target	Budgetary Allocation
300 MW (including Biomass Power and Biomass Cogeneration)	15 crores

4.58 On being asked if the allocation will be sufficient to meet the target set, the Ministry stated that the allocation is not sufficient to meet the targets and more funds will be demanded at R.E. stage.

4.59 When asked about the activities/projects proposed to be undertaken during 2018-19, the Ministry replied that a new scheme is being formulated to promote paddy straw based power generation in the states of Punjab, U.P., Rajasthan and Haryana.

4.60 On being asked about the provisions of fiscal and financial incentives provided by the Government in Biomass/Bagasse Co-generation Sector, the Ministry furnished:

Project Type	Special Category States	Other States
Biomass Power projects	Rs.25 lakh per MW (Maximum Support of Rs 1.5 Crore per Project.)	Rs.20 lakh per MW (Maximum Support of Rs 1.5 Crore per Project.)
Bagasse Co-generation by Private sugar mills*	Rs.18 lakh per MW (Maximum Support of	Rs.15 lakh per MW (Maximum Support of

	Rs 1.5 Crore per Project.)	Rs 1.5 Crore per Project.)
Bagasse Co-generation projects by cooperative /public sector sugar mills	(maximum support Rs. 6.0 crore per project)	(maximum support Rs. 6.0 crore per project)
40 bar & above	Rs.40 lakh	Rs.40 lakh
60 bar & above	Rs.50 lakh	Rs.50 lakh
80 bar & above	Rs.60 lakh Per MW of surplus power	Rs.60 lakh Per MW of surplus power

IV. SMALL HYDRO PROGRAMME

4.61 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 is in the process of announcing a new scheme for implementation of Small Hydro Projects along with various other sub-schemes. In cumulative terms, 1089 small hydropower projects aggregating to 4418.155 MW have been set up in various parts of the country. In addition, 136 projects of about 754.16 MW are in various stages of implementation.

4.62 When the Committee asked about the estimated potential and installed capacity of Small Hydro Power in the country, 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). Installed Small Hydro Power capacity as on 31.12.2017 is 4418.15 MW. State wise details, as furnished by the Ministry, are given below:

STATE WISE NUMBERS AND AGGREGATE CAPACITY OF SHP PROJECTS (UPTO 25 MW)

POTENTIAL, INSTALLED & UNDER IMPLEMENTATION (as on 31.12.2017)

Sl. No.	State	Potential		Projects Installed		Projects under Implementation	
		Nos.	Total Capacity (MW)	Nos.	Capacity (MW)	Nos.	Capacity (MW)
1	Andhra Pradesh	359	409.32	44	162.11	0	0
2	Arunachal Pradesh	800	2064.92	152	104.605	16	41.05

3	Assam	106	201.99	6	34.11	1	2
4	Bihar	139	526.98	29	70.7	0	0
5	Chattisgarh	199	1098.2	10	76	0	0
6	Goa	7	4.7	1	0.05	0	0
7	Gujarat	292	201.97	6	16.6	13	92.31
8	Haryana	33	107.4	9	73.5	1	0.1
9	Himachal Pradesh	1049	3460.34	184	842.11	28	272.3
10	J&K	302	1707.45	42	161.03	20	53.2
11	Jharkhand	121	227.96	6	4.05	0	0
12	Karnataka	618	3726.49	167	1230.73	3	29
13	Kerala	238	647.15	33	219.02	9	76
14	Madhya Pradesh	299	820.44	11	86.16	1	9.75
15	Maharashtra	270	786.46	66	349.175	13	40.2
16	Manipur	110	99.95	8	5.45	0	0
17	Meghalaya	97	230.05	4	31.03	2	24
18	Mizoram	72	168.9	18	36.47	4	8.7
19	Nagaland	98	182.18	12	30.67	2	1.15
20	Odisha	220	286.22	10	64.625	5	60.5
21	Punjab	375	578.28	54	170.9	9	7.55
22	Rajasthan	64	51.67	10	23.85	0	0
23	Sikkim	88	266.64	17	52.11	0	0
24	Tamil Nadu	191	604.46	21	123.05	0	0
25	Telengana	94	102.25	30	90.87	0	0
26	Tripura	13	46.86	3	16.01	0	0
27	A&N Islands	7	7.27	1	5.25	0	0
28	Uttar Pradesh	251	460.75	9	25.1	2	25.5
29	Uttarakhand	442	1664.31	102	214.32	7	10.85
30	West Bengal	179	392.06	24	98.5	0	0
Total		**7134**	**21133.62**	**1089**	**4418.155**	**136**	**754.16**

4.63 On being asked about the physical targets and achievements under SHP programme during the previous 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	105.9
4	2017-18	100	73.80 (upto Jan, 2018)

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

> "The targets set for a particular year, as shown above, are the actual completion and commissioning of the projects in a particular financial year. SHP projects have a gestation period of about five years and there are a number of uncertainties associated in actual commissioning of the projects such as natural calamities (flood or draught), resistance of local communities, inadequate evacuation facilities or non-completion of planned evacuation facility on time, cost escalation etc. The targets shown/set are based on the progress conveyed by the State Government agencies or the SHP Developers. In addition reluctance of DISCOMs to sign PPA at higher rate is also one of the main reasons for not coming up of new SHP projects."

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

Financial support (Rs. in Crore)			
S.No.	**Year**	**Budget allocation**	**Expenditure**
1	2014-15	108.00	107.99
2	2015-16	105.5	104.99
3	2016-17	125.00	124.70 +54.987 (from IREDA Bond Money) = 179.687
4	2017-18	123.50	95.33 (upto Jan, 2018)

4.66 When asked about the physical target and budgetary allocation for SHP Programme for the year 2018-19, the Ministry stated that the Physical target for the year 2018-19 is 250 MW and Budgetary allocation is Rs.218.5 crore.

4.67 On being asked if the allocation would be sufficient to achieve the target, the Ministry stated that the budget is adequate.

4.68 On a query about the major activities/projects proposed to be undertaken under SHP Programme during 2018-19, the Ministry stated:

> "Implementation of SHP program is presently approved for 12th plan period i.e. upto 31.03.2017, besides this Ministry is considering proposals for following major activities during 2018-19:-
>
> (a) Reassessment/ confirmation i.e. marking of SHP sites on the ground through State Governments in the country.
>
> (b) 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."

4.69 Regarding the provisions of fiscal/financial incentives provided by the Government, the Ministry stated that it has been providing financial support for following activities towards development of SHP sector:

a) "Research and development, capacity building
b) Resource assessment, Detailed Survey and Investigation, DPR Preparation and Perspective Plans for States
c) Capital Subsidy to State Sector Project
d) Subsidy for Commercial Projects
e) Renovation and Modernization of old SHP projects (State sector)
f) Water Mills/Micro-hydel projects."

4.70 The following subsidies have been proposed by the Ministry for implementation of SHP Programme subject to approval:

Purpose	**Pattern of financial Support**	
Subsidy for setting up of SHP Plants	Same for Government & private Sector, 30% of benchmark cost set by CERC in its tariff order or 30% of actual cost whichever is lower, with upper ceiling of 10 times of per MW CFA.	
Subsidy for setting up Micro Hydel upto 100 kW	60,000/kW (This is also kept at 30% of the benchmark cost, which is 2 crore/MW being very small projects. However, this subsidy would be available only for the projects set up in non-State/Central grid connectivity in remote and far-flung areas to meet the local power requirements.	
Support for DSI & DPR	Rs.6 lakh for projects upto 1 MW projects and Rs. 10 lakh for projects capacity more than 1 MW	
Support for setting up Watermill	Rs.50000/- per watermill (Mechanical application)	
	Rs.1.50 lakh/watermill (Electrical application)	
Renovation and Modernization of SHP	Rs.20000/kW upto 1 MW	Rs.1.5 crore/MW with maximum upto 7.5 crore
Grant to AHEC Roorkee	Rs.2.0 crore/annum	

4.71 When the Committee queried about the progress with regard to the National Mission on Small Hydro, the Ministry replied that the National Mission on Small Hydro has been dropped.

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.

5.2 National Biogas and Manure Management Programme (NBMMP) aims to provide biogas plants as an asset for households, communities of households for meeting their clean cooking fuel needs in particular to rural/semi-urban households and organic manure for raising farm yield and productivity and maintaining the soil health. Biogas plants are, thus potential source of helping farmers in adopting organic farming. The NBMMP is being implemented during the year 2017-18 as per the demand and physical targets received from the States. Against the annual physical targets of 65180 biogas plants for 2017-18, about 20,000 family type biogas plants are reported to have been set up upto December, 2017.

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 49.76 lakh family type biogas plant have been installed in the country.
>
> ii. The Ministry is also implementing biogas based power generation (off grid) programme for generating power and thermal energy to meet decentralized/ off grid renewable energy needs."

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:

> "The details in respect of the National Biogas and Manure Management Programme and Biogas based Power Generation (off grid) Programme are given for three years as under:

(Rs. In crore)

Sl. No.	Years	BE	RE	Actual Expenditure
1	2015-16	133.00	96.94	89.157
2	2016-17	142.00	100.00	78.696
3	2017-18	134.00	94.00	44.58

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

Schemes	Yr. 2014-15		Yr. 2015-16		Yr. 2016-17		Yr. 2017-18	
	Target	Ach	Target	Ach	Target	Ach	Target	Ach
Bio-Gas Programme (NBMMP)	110000	84882	111000	74705	100000	57504	65180	22,000 (as on 31.12.17)

5.6 When asked about the reasons for continuous non-achievement of targets, the Ministry stated:

> "The major reasons for shortfall of physical targets under the National Biogas and Manure Management Programme include:
> (a) back-to-back drought conditions of two years 2014-15 and 2015-16.
> (b) high upfront cost of biogas plants.
> (c) Low CFA / subsidy support.
> (d) lack of priority at state level.
> (e)Impact of Ujjawala scheme.
> (f) Low Publicity of the Programme by the implementing Agency."

5.7 On being asked about the corrective measures taken by the Ministry in the implementation of the programme so as to achieve the desired results, the Ministry stated:

> "Ministry has assigned an independent evaluation study to a third party to bring out the performance inter-alia various other performance indicators including operational status of installed biogas plants during the 12th Five Year Plan. Based on the outcomes of the study and its recommendations, the scheme of the National Biogas and Manure Management Programme (NBMMP) is being modified and re-designed from year 2017-18. SFC has already taken place on Dec, 2017."

5.8 When the Committee desired to know the programme/project/scheme that would be covered under Renewable Energy for Rural Applications in the year 2018-19, the Ministry stated:

"Budgetary allocation of 2018-19 in respect of Off-Grid/Distributed and Decentralized Renewable Power includes Biogas. Biogas has been merged under Off-Grid/ Distributed and Decentralized Renewable Power."

5.9 On being queried about the details of targets (physical and financial) of different Programme /Schemes for the year 2018-19, the Ministry stated:

(**Rs. in crores**)

Programme /Scheme	**Allocation 2018-19**	**Physical Target**
Biogas under Off-Grid/ Distributed and Decentralized Renewable Power	Rs. 135.00	1.0 lakh (in Nos.)

CHAPTER VI

RENEWABLE ENERGY FOR URBAN, INDUSTRIAL AND COMMERCIAL APPLICATIONS

6.1 The programmes being implemented under Renewable Energy for Urban, Industrial and Commercial Applications include:

- Energy Efficient Solar /Green Building Programme;
- Energy from Urban, Industrial and Agricultural Wastes/Residues; and
- Energy from Urban, Industrial and Agricultural Waste/Residues including Biomass Co-generation (non-bagasse) 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. 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.
>
> 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.
>
> In addition, the Ministry of Urban Development is also implementing "Swachh Bharat Mission" (SBM) since 2 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."

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

> "Details of Physical Achievements vis-a-vis targets during last three years under Waste to Energy programme are as follows:

Year	Physical Target (MWeq)			Physical Achievement (MWeq)		
	Grid	Off-Grid	Total	Grid	Off-Grid	Total
2014-15	20	10	**30**	0	12.00	**12.00**
2015-16	10	10	**20**	0	14.13	**14.13**
2016-17	10	15	**25**	7.50	5.57	**13.07**
2017-18	5	20	**25**	0	7.62	**7.62**

6.4 On being queried about the financial achievements *vis-a-vis* targets under Urban, Industrial and Commercial Applications during last three years, the Ministry furnished as under:

"Details of Financial Achievements vis-à-vis targets during last three years under Waste to Energy programme are as follows:

Year	Financial allocation (Rs. in crore)			Financial Achievement (Rs. in crore)		
	Grid	Off-Grid	Total	Grid	Off-Grid	Total
2014-15	13	7.5	**20.5**	0	9.15	**9.15**
2015-16	10	15.5	**25.5**	0	13.32	**13.32**
2016-17	10	15.5	**25.5**	1.5	5.62	**7.12**
2017-18	12.50	16.0	**28.5**	5.5	7.71	**13.21**

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

"Delay in obtaining all statutory clearances/approvals by the project developer, loan approvals from the banks and Appraisal Note, signing of PPA, approval for filling & storage of CBG/Bio-CNG from Petroleum and Explosives Safety Organisation (PESO), Analysis Report of Effluent quantity and characteristics from accredited lab, etc."

6.6 When asked to furnish the budgetary allocation along with physical targets for different schemes/technologies under Renewable Energy for Urban, Industrial and Commercial Applications for the year 2018-19, the Ministry stated:

Target for FY 2018-19			
	Grid	**Off-Grid**	**Total**
Financial	Rs. 10 Crore	Rs. 12 Crores	Rs. 22 Crores
Physical	5 MW	15 MW	20 MW

6.7 When the Committee desired to know the steps taken/proposed to be taken by the Ministry to achieve the targets during 2018-19, the Ministry stated:

- "The Ministry has already sanctioned 30 new projects with a cumulative capacity of about 40 MWeq. These projects are at various

stages of commissioning and expected to be installed and commissioned during the next financial year 2018-19. Therefore, target set during 2018-19 would be fully achieved.

- The Ministry has been requesting 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, Ministry is also supporting awareness programmes involving industrial sector to develop suitable proposals for meeting captive thermal and electrical needs."

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

Wastes/Processes/Technologies	Central Financial Assistance
a) Power generation from Municipal Solid Waste	Rs. 2.00 crore/MW (Max. Rs.10crore/project)
b) 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)
c) Biogas generation from Urban, Industrial and Agricultural Wastes/residues	Rs. 0.50 crore /MWeq. (12000 m^3 biogas /day with maximum of Rs. 5 cr./ project)
d) 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

Other incentives and support measures provided by the Ministry under the programme are as follows:

i. Incentives to State Nodal Agencies: service charge @ Rs. 1% of the subsidy restricted to Rs. 5.00 lakh per project,
ii. 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.

In addition, the Ministry of Urban Development is also implementing "Swachh Bharat Mission" (SBM) since 2 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."

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

- "Accelerated Depreciation: Tax depreciation rate of 80% under AD benefits
- Concessional Custom Duty Exemption and GST: Waste to Energy projects draws 5% GST besides availing concessional custom duty which would help the promoters / developers to avail these concessions to improve economic viability of the projects.

Power Purchase Policy from Waste to energy plants:

- According to the amended Tariff Policy, Distribution Licensee(s) shall compulsorily procure 100% power produced from all the Waste-to-Energy plants in the State, in the ratio of their procurement of power from all sources including their own, at the tariff determined by the Appropriate Commission under Section 62 of the Act.
- The Central Electricity Regulatory Commission (CERC) vide notification dated 07th October 2015 and 31st March 2015 have notified norms for determination of Generic Tariff for MSW, RDF and Biogas based WTE projects along with Generic Tariff for FY 2016-17. The Levelised Tariff which is in the range of Rs.6.50 to Rs.7.60 per unit."

6.10 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 the following:

- Viability Gap Funding Swacch Bharat Mission of MoUD.
- Loan from IREDA
- Grants from MNRE for Supporting W to E Projects
- Preferential Tariff by Regulators.
- Support for Purchase of Compost from Ministry of Agriculture."

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

"At present, six waste-to-energy plants using Municipal Solid Waste (MSW) with cumulative installed capacity of 65.75 MW are in operation in the country. The State-wise details of Municipal Solid Waste (MSW) based power projects set up, as on 31.01.2018, are given below**:**

S. No.	State / UTs	Plant Commissioned/Under trial	Installed Capacity (MW)
1.	Delhi	M/s Ramky Group at Narela-Bawana, New Delhi	24.0
2.	Delhi	M/s Jindal Urban Infrastructure Pvt Ltd. at Okhla, New Delhi	16.0
3.	Delhi	M/s IL&FS Environment Infrastructure and Services Ltd. at Ghazipur, New Delhi	12.0
4.	Madhya Pradesh	M/s Essel Infra at Jabalpur	9.0
5.	Maharashtra	M/s Solapur Bio-energy Systems Pvt. Ltd at Solapur	3.0
6	Himachal Pradesh	M/s Elephant Energy Private Limited at Shimla	1.75
		Total	**65.75**

6.12 Further, it has been stated that the Ministry of New and Renewable Energy (MNRE) supported 180 waste-to-energy plants based on Municipal Solid Waste (MSW), Urban, Industrial and agricultural waste / residues for generation of power, biogas and bio-CNG to meet thermal and electrical energy needs of industries and for production of Bio-CNG for transportation as well as cooking fuel etc. These plants have been established involving industries and private sector following Public Private Partnership (PPP) model. State-wise details of waste-to-energy plants with installed capacity and number of plants set up, as on 31.01.2018, are given below:

SI. No.	Name of State / Union Territories	MSW based Power Plants	Agricultural, Urban & Industrial Effluent/Waste based Waste to Energy plants			
			Grid Power	Off-grid Power	Biogas	BioCNG
		MW (No. of plants)	MW (No. of plants)	MW (No. of plants)	m^3/day (No. of plants)	Kg/day (No. of plants)
1	Andhra Pradesh	-	23.16 (4)	17.66 (12)	74,640 (6)	-
2	Bihar	-	-	-	12,000 (1)	-
3	Chhattisgarh	-	-	0.33 (1)	-	-
4	Delhi	52.00 (3)	-	-	-	-
5	Gujarat	-	-	11.28 (10)	24,840(4)	12,538 (2)
6	Haryana	-	-	4.0 (2)	-	2,050 (2)
7	Himachal Pradesh	1.75 (1)	-	-	12,000 (1)	-

8	Karnataka	-	1.00 (1)	4.8 (3)	58,080 (3)	-
9	Kerala	-	-	-	2,760 (1)	-
10	Madhya Pradesh	9.00 (1)	3.9 (2)	-	5,640 (3)	1,200 (1)
11	Maharashtra	3.00 (1)	9.59 (3)	14.63 (10)	73,080 (8)	19,533 (3)
12	Punjab	-	9.25 (2)	4.17 (3)	33,720 (5)	1,847 (1)
13	Rajasthan	-	-	3.0 (1)	-	4,000 (2)
14	Tamil Nadu	-	6.4 (3)	4.05 (3)	1,42,920 (27)	-
15	Telangana	-	18.5 (3)	1.0 (1)	30,000 (4)	-
16	Uttar Pradesh	-	-	44.63 (22)	46,200 (4)	-
17	Uttarakhand	-	-	1.89(2)	67,200(5)	5,460(1)
18	West Bengal	-	-	-	14,040(2)	-
Total		**65.75 (6)**	**71.8 (18)**	**111.44 (70)**	**5,97,120 (74)**	**46,628 (12)**

CHAPTER VII

RESEARCH, DESIGN, DEVELOPMENT AND DEMONSTRATION IN RENEWABLE ENERGY SECTOR

7.1 Technology development, validation and standardization are the core requirements for the growth of New & Renewable Energy. In this endeavor, the Ministry New & Renewable Energy (MNRE) supports Research, Development and Demonstration (RD&D) to develop new and renewable energy technologies, processes, materials, components, sub-systems, products & services, standards and resource assessment so as to indigenously manufacture new and renewable energy systems and devices including integration for large scale use of new and renewable energy in the country. The objective of the programme is to make industry competitive and renewable energy generation supply self-sustainable/profitable and thereby contribute to increase share in total energy mix in the country.

7.2 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. A comprehensive policy framework on Research, Development and Demonstration (RD&D) is in place to support RD&D in new and renewable energy sector, including associating and supporting RD&D earned out by industry for market development. The Ministry provides upto 100% financial support to Government/non-profit research organizations/NGOs and 50% to industry.

7.3 When asked about the budgetary allocation and the actual expenditure incurred on RD&D in New & Renewable Energy during the last three years, the Ministry furnished:

Year	BE	RE	Expenditure
2015-16	90.00	106.00	100.98
2016-17	445.00	272.85	212.35
2017-18	144.00	81.00	43.78 (up to 31.1.2018)

*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. One such project, 1MWe Solar Thermal Power Plant with 16 hours thermal storage has set up at Mount Abu by World Renewable Spiritual Trust (WRST), Mumbai. 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 and low utilization of funds during the previous years, the Ministry stated that the R&D projects are continuous in nature with duration of generally three years. Funds are released after compilation of various mile stones and proper evaluation of the ongoing projects.

7.6 Regarding the Budgetary Allocation for the year 2018-19, the Ministry informed that an amount of Rs. 94.00 crore has been allocated for research, demonstration and development during 2018-19.

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 2018-19, the Ministry informed:

> "Support will be provided for development, demonstration, testing , standardization, and validation of technologies/ systems/ components with emphasis on application oriented R&D, improving efficiency, reliability and cost effective for indigenous development and manufacture. Industry association will be encouraged. In solar thermal, the thrust areas include development of solar thermal technology for power generation and industrial process/heat, storage systems, hybridization, etc. In SPV, thrust is on improving Si PV efficiency, reducing the cost, developing new material solar cells, making Si material from sand, improving modules quality and reliability, development of standard designs for support structure for SPV systems, materials and fabrication technology for solar cells and modules, inverters, power conditioning units, grid integration, etc. In addition, focus would be on storage solutions. The thrust areas in biogas included development of efficient and cost effective designs of biogas plants,

standardization of multiple designs of biogas plants, standardization of biogas slurry based bio-fertilizer, bio-manure up-gradation, development of biogas purification systems, development of efficient biogas engine for power generation. In wind, the thrust areas include wind turbine system design, integration, off-shore technology and wind solar hybrid system. In SHP, thrust areas include development of ultra-low head turbines (below 3m), generators, monitoring systems, pumped storage systems, etc. R&D in hydrogen and fuel cells will focus on hydrogen production from various feedstock, technology for storage and development of efficient and cost effective fuel cells for stationary, transport applications."

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 Renewable Energy Sector, the Ministry replied:

"The Ministry supported projects to various R&D/academic institutes/industries to strengthen them for pursuing advanced research for technology development and demonstration and also for collaboration in solar, wind, bio-energy, hydrogen and fuel cells. In 2015, MNRE organized a "Brainstorming Consultations Meeting" for review of R&D programme and for identifying thrust areas for RD&D with action plan. Key experts were invited for the purpose. The Ministry constituted subject wise "Panel of Experts" for evaluation of RD&D Programme implemented in 12th Plan Period. The Panel of Experts conducted appraisal of R&D projects during 11-14.09.2017 and submitted evaluation report with recommendation and suggestion for action for strengthening RD&D programme.

The Ministry has recently prepared a comprehensive RD&D Programme for implementation during the period 2017-18 to 2019-20 with emphasis on integrating technology development with innovation and start-ups for promoting indigenous development and manufacture of New & Renewable Energy Systems/devices/components for various applications. A Technology Development and Innovation Policy (TDIP) is in the process for finalization for release for implementation."

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

"<u>R&D activities being carried out by NISE</u>

- National Primary Standard Facility for Solar Cell Calibration with NPL, Delhi and NISE Gurugram.
- Development of high efficiency (21%/ 19%) PERC type of c-Si/mc-Si solar cells.

- NISE restart the 1 MW Solar thermal power plant in the campus and The test facility is aimed at helping designing solar thermal power projects based on technology parameters and climatic conditions of the locations.

- Development and field testing of Solar powered clean drinking water systems for communities without piped water line and electricity with collaboration with Industry. Successful prototypes have been developed and being install at various location in the Country.

R&D activities are being carried out by SECI

- Development of Solar PV and wind hybrid power plant with large scale battery storage at Kaza, Himachal Pradesh.
- Setting up facility for calibration of solar radiation measuring sensors and its analysis/ modelling based on ground surface measurements which have been installed at NISE Campus and now it is being handed over to NISE for further development. "

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 towards developing higher efficiency solar cells up to 20% and beyond, efficient inverters and other power electronic devices, high energy density battery storage systems, etc. In solar thermal, R&D efforts are directed towards technology development and demonstration of utilizing solar thermal energy for industrial process heating applications, power generation, developing solar thermal storage systems, etc."

CHAPTER VIII

PSUs/INSTITUTIONS UNDER THE MINISTRY OF NEW AND RENEWABLE ENERGY

8.1 To support the Ministry, there are five institutions i.e. two Public Sector Undertakings - Indian Renewable Energy Development Agency (IREDA) and Solar Energy Corporation of India (SECI) and three autonomous bodies- National Institute of Solar Energy (NISE), National Institute of Wind Energy (NIWE), and National Institute of Bio Energy (NIBE). NISE is located at Gwal Pahari in district Gurugram, Haryana and serves as the technical focal point for solar energy research & development. NIWE has been established in Chennai, Tamil Nadu and serve as the technical focal point for wind power research & development. NIBE is located in district Kapurthala, Punjab and is focusing on research & development in Bio energy. IREDA is a Non-Banking Financial Institution located in New Delhi, under the administrative control of the Ministry, provides term-loans for renewable energy and energy efficiency projects. SECI is a section 3 company under the Companies Act situated in New Delhi. It assists the Ministry and functions as the implementing and executing arm for the Jawaharlal Nehru National Solar Mission.

I INDIAN RENEWABLE ENERGY DEVELOPMENT AGENCY (IREDA)

8.2 When asked about the performance of IREDA during the last three years, the Ministry furnished:

(Rs. in Crore)

Parameters	2014-15		2015-16		2016-17	
	Target	Achievement	Target	Achievement	Target	Achievement
Sanction	4400	4548.79	6150	7806.46	10000	10199.01
Disbursement	2500	2619.45	3675	4257.39	6100	6593.49
NPA to loan assets (Net)	3%	3.84%	Nil	4.09%	3.65%	3.77%
Profit before Tax	Nil	378.58	Nil	417.62	510	528.18
Profit after tax		272		298		365
Dividend paid		54.40		150.00		*125.50
Revenue from operation	Nil	1117.85	Nil	1174.03	1525	1479.27
MoU Rating		Excellent		Very Good		Excellent

*5% of IREDA's net worth of Rs.2510 cr.

8.3 On being asked about the financial allocation vis-à-vis utilization during the previous years, the Ministry furnished the following details towards financial/equity allocation from MNRE to IREDA

(Rs. in Crore)

	2014-15	**2015-16**	**2016-17**
Government Equity	40	IREDA was conferred with Mini Ratna Category-I status in May, 2015, therefore, no further government equity has been allocated through budget.	

8.4 In reply to a query regarding the major activities/projects proposed to be undertaken by IREDA during 2018-19, the Ministry stated as under:

> "IREDA shall continue its activity of financing of RE projects in various sectors such as Wind, Solar, Small Hydro, Biomass, Cogeneration, Waste to Energy and the projects based on New & Renewable Energy technology."

II SOLAR ENERGY CORPORATION OF INDIA (SECI)

8.5 When asked about the performance of SECI during the previous years, the Ministry furnished:

SOLAR GROUND MOUNTED PROJECTS			
	Capacity tendered	Capacity allocated/PPA signed	Capacity commissioned
Cumulative upto 2016-17	-	3,965 MW	760 MW
2017-18	3,975 MW	1,500 MW	830 MW

WIND PROJECTS			
	Capacity planned	Capacity tendered	Capacity allocated
Cumulative upto 2016-17	1,000 MW	1,000 MW	-
2017-18	5,000 MW	5,000 MW	2,049.9 MW

8.6 On being asked about the financial allocation vis-à-vis utilization during the previous years, the Ministry furnished the following details:

Equity support received from MNRE	
2015-16	92 Crore
2016-17	100 Crore
2017-18	50 Crore

8.7 When inquired about the financial allocation for the year 2018-19, the Ministry stated that SECI did not seek any equity support from the Ministry for the year 2018-19, as the new projects, to be undertaken in the year 2018-19, will be carried out from the internal resources.

8.8 When asked about the physical targets for the year 2018-19, the Ministry furnished:

- "Solar Ground mounted projects: Issue of tenders for 18,000 MW of solar projects in 'developer mode'.
- Wind : Issue of tenders for 10,000 MW of wind projects in 'developer mode'.
- Own projects-

160 MW Solar-wind hybrid project-Placement of Award
10 MW at DRDO, Karnataka- Placement of Award"

III NATIONAL INSTITUTE OF SOLAR ENERGY (NISE)

8.9 The main objective of NISE, as furnished by the Ministry, are to:

- "function as the apex National Research Organization for undertaking and/or sponsoring Research and Development Projects on various aspects of Solar Energy Technologies; and
- act as an Apex Organization for initiating and coordinating the R&D in the field of Solar Energy and related areas.

The main functions of NISE include assisting Ministry in implementing the objectives of National Solar Mission through appropriate mechanism, evolving S&T programmes and projects, managing special projects, overseeing and coordinating with all relevant stakeholder agencies in the pursuit of the above objectives."

8.10 When asked about the performance of NISE during the last three years, the Ministry furnished:

"Major achievements of NISE during last three years i.e. 2014-15, 2015-16 & 2016-17 are as follows:

- Establishment of inverter test laboratory upto 50 kWp and its NABL accreditation
- Up-gradation of module testing laboratory and its NABL accreditation
- Creation of automatic water pumping testing facility
- Up-gradation of battery testing facility
- Creation of Concentrating Solar Technologies (CST) test facility
- Creation of solar radiation measuring equipment calibration facility

- Establishment of a 1 MW solar thermal power plant based on LFR and parabolic trough technologies.
- Installed 770 kWp SPV power plants capacity in the campus and NISE is moving towards the NET Positive Energy campus.
- Calibration and monitoring of 58 nos. Solar Radiation Resource Assessment (SRRA) stations in Northern region.
- Development of Solar Thermal Cold Storage with 5 kWp Solar PV Plant standalone system for villages.
- Development of solar powered Drinking RO system based Water ATM.
- Development of Solar Milk Chilling Plant.
- Development of Solar thermal based Cooking and Drying System.
- Implementation of Suryamitra Skill Development programme in which over 11,013 nos. Suryamitras i.e. solar technicians have been trained against a target of 9,000 during last two years.
- Organized 70 batches under ten various types of solar energy capacity building programmes of ranging from 2 to 10 days under which 2,179 participants were imparted trainings covering various aspects of solar technologies.
- Organized 15 batches of International Training programmes on solar energy technologies in which total 386 number of participants from 84 countries attended trainings.
- Publication of 51 Research Technical Papers on various aspects of solar energy in National and International Journals of repute and conferences."

8.11 On being asked about the financial allocation vis-à-vis utilization during the previous years, the Ministry furnished the following details:

(Rs. in Crores)

Year	Financial Allocation	Actual Utilization
2014-15	34.43	19.40
2015-16	17.75	17.27
2016-17	20.00	13.70

8.12 In response to a query regarding reasons for non-utilization of the allocated funds, the Ministry stated that during 2014-15, the less utilization was due to the fact that the building construction was delayed due to various reasons. During 2016-17, the main reason was delay in finalization of global tenders for procurement of few lab equipments and delay in final settlement of the building construction project due to few pending construction related activities.

8.13 When inquired about the financial allocation for the year 2018-19, the Ministry stated:

> "The Budget Estimate for 2018-19 has been approved for Rs.18.00 Crore under following Heads:
>
> - General - Rs.5.00 Crore
> - Capital - Rs.9.50 Crore
> - Salary - Rs.3.50 Crore"

8.14 On being asked if the allocated funds will be sufficient to meet the target set, the Ministry stated that if all the activities planned are taken up, the above allocated funds will not be sufficient. For example, the creation of integrated lab complex including equipments to create a world class R&D and test lab facilities itself will require about Rs.250 Cr. The separate allocation would be required by the Ministry.

8.15 When queried about the major activities/projects proposed to be undertaken during 2018-19, the Ministry furnished:

- "Creation of a Center of Excellence for development of solar water Pumping systems for research, design, testing and training.
- Creation of Integrated Sphere Test facility in lighting lab.
- Creation of Mobile test Laboratory for PV systems.
- Up-gradation and Modernization of existing solar water pumps and solar lighting systems Lab.
- Up-gradation of inverter testing facility from present 50 kW capacity to 2 MW capacity.
- Creation of fire test facility as par IEC standard.
- Development of Centralized Monitoring Centre (CMC) at NISE to monitor the performance of Solar Power Plants installed in the country.
- Creation of Integrated Lab Facilities in NISE.
- To take up research projects on storage systems.
- To set up pilot scale plants for solar thermal cooling/cold storage and solar chilling technologies developed at NISE.
- Accreditation of all test laboratories from NABL & BIS."

IV NATIONAL INSTITUTE OF WIND ENERGY (NIWE)

8.16 When asked about the performance of NIWE during the previous years, the Ministry furnished:

i) "Offshore Wind Assessment is based on measurements carried out both on near shore and offshore installations and has facilitated the offshore through the following activities:

- Near shore measurements have been completed for the Dhanushkodi, Tamil Nadu region and are under way for the Gulf of Khambat (Gujarat Coast) region at Jaffarabad with probable high wind resources.
- Offshore sea based measurements using LIDAR has started at the Gulf of Khambat (Gujarat Coast) region and is proposed at the Gulf of Mannar during this year.

ii) On-shore Wind and solar Resource Assessment are ongoing continuous activity carried out by NIWE as well as a few private players.

iii) NIWE is the pivotal Institution for all Wind and Solar Resources Assessment. NIWE Wind Atlas and Solar Atlas has been prepared and published.

iv) Wind Atlas for the heights of 50, 80 and 100 meters has been published and the potential at 100m estimated at 302 GW. Now 150m Wind Atlas is under preparation.

v) NIWE is mandated for both Wind & Solar forecasting and in this regard necessary infrastructure and technology development is being taken up.
- NIWE is running the pilot service in Tamil Nadu for the last two years
- MoU's are being signed with other renewable rich states for the forecasting services so as to assist SLDCs & RLDCs in integrating Wind & Solar resource based energy into the Grid.

vi) NIWE is the accredited Testing facility for some of the services in Wind generation. In the last 3 years testing services has been provided to 7 Large Wind Turbines and 16 Small Wind Turbines.

vii) NIWE has its Wind Turbine Research Station at Kayathar were the turbines of various capacities are tested and also research is being carried out. Last year a 2 MW Wind Turbine with LVRT capabilities has been added to the existing fleet of research turbines to enhance our research capabilities.

viii) NIWE is the authorized Institution in the country for Type Certification also developing Standards on Wind related areas.

ix) NIWE has conducted 18 trainings on Wind Energy Tech & Applications of which are 10 international (ITEC & SCAAP) and 8 for national level participants. Specialized training on Wind engineering based were conducted for target participants from core sectors both within and outside the country."

8.17 On being asked about the financial allocation vis-à-vis utilization during the previous years, the Ministry furnished the following details:

(Rs. in lakhs)

Particulars	2014-15	2015-16	2016-17
Grant-Carry Forwarded	210.93	413.04	1360.99
Grant Received	1,264.52	2176.00	2,525.00
Grant Utilized	1,095.58	1,259.07	1687.28

8.18 In response to a query regarding reasons for non-utilization of the allocated funds, the Ministry stated:

> "The nature of activities namely, Geo-physical, Geo-technical studies, offshore LIDAR, Near shore wind profile measurements are unique and most of the instruments & equipment's are to be imported. It consumes more time to identify the suppliers & floating tenders and placing orders. However necessary steps have been taken and funds will be utilized at the earliest."

8.19 When inquired about the financial allocation for the year 2018-19 and its sufficiency, the Ministry stated that a sum of Rs.20 crores have been approved for the financial year 2018-19 and the additional fund will be sought during RE stage 2018-19.

8.20 When queried about the major activities/projects proposed to be undertaken during 2018-19, the Ministry furnished:

- "WRA Uncovered / New Areas 2018-19 - Establishment of wind monitoring stations (a) Onshore and (b) Offshore -Tamil Nadu & Gujarat
- Development of Offshore Experimental/Research Platform at Dhanushkodi, Rameswaram, Tamil Nadu
- Geo-tagging of Wind Turbine and data repository
- Creation of new "Indian Certification Scheme"
- Creation of LVRT new facilities
- Test and Design & Development lab facility for Small Wind Turbines
- Micro grid, net zero along with storage facility for research at NIWE, Chennai campus."

V NATIONAL INSTITUTE BIO ENERGY (NIBE)

8.21 The main objectives of NIBE, as furnished by the Ministry, are:

- "To carry out and facilitate research, design, development, testing, standardization and technology demonstration eventually leading to commercialization of RD&D output with a focus on:
  a. Bio-energy, bio-fuels and synthetic fuels in solid, liquid and gaseous forms for transportation, portable and stationary applications;
  b. Development of new technologies for effective utilization of different type of wastes and production of value added products.
- To undertake and facilitate human resource development and training including post-doctoral research in the area of bio-energy.
- To create facilities for operationalization of the Institute."

8.22 When asked about the performance of NIBE during the previous years, the Ministry furnished:

i) "Developed facilities for R &D in bio-fuel, biogas and cook stove.
ii) Launched Bio-energy Promotion Fellowship.
iii) Developing / setting up of lab for R&D, testing, certification of biogas technology/systems for various applications.
iv) Sustainable development of power generation from biogas and biomass for rural electrification.
v) Downstream processing of bio-fuel (ethanol, biodiesel, green diesel, bio-petrol, butanol etc.) as partial substitute of petroleum,
vi) Dissemination of improved, energy efficient and smoke free cook stove for rural and hilly regions.
vii) Organized "Brainstorming Consultation Experts Meeting on Biogas Development" on 23rdJune, 2017 to formulate an Action Plan for R&D, Testing, evaluation and standardization of biomass energy systems.
viii) The Action Plan on biomass resource assessment, technology development, validation, testing, field evaluation, standardization for multiple feed stocks in bio-energy sector particularly bio-methanation/biogas technology used for various applications are being initiated.
ix) Imparting training for Skill Development programmes.

Research Activities Undertaken:

i) The R&D laboratories for basic testing and characterization facilities have been established for –
   a. Biodiesel, Hydro processing, Catalysis and Fuel Cell.
   b. Bio-ethanol, Bio-butanol, Biogas, Bio-hydrogen, Metabolic Engineering.
   c. Biomass Characterization, Gasification, Pyrolysis, Cook stoves, New and Hybrid Energy Systems.
   d. Biomass Gasification and Testing Facilities.
ii) Continuing ongoing activities viz. testing and characterization facilities for bio-fuel and cook-stoves.

Specific programs, activities, projects and achievements:

- The Institute is regularly hosting national training programs in the frontier areas of bio-energy and bio-fuel technologies. So far six such training programs have been completed.
- Organizing national conference on "Recent Advances in Bio-energy Research" as an annual event since 2011.
- The ongoing R&D projects includes-
  a. Bio-ethanol production from lignocellulosic biomass,
  b. Bio-crude production from non-edible vegetable oil,
- R&D project completed on integrated technology development for biodiesel production using heterogeneous catalyst. From the findings of this work, one of the catalyst derived from Musa balbisianacolla underground stem was found very efficient for biodiesel production from high free fatty acid containing Jatropha curcas oil under elevated condition in a single step process and a pilot scale level facility is likely to be developed soon.

- R&D project entitled 'Process development for bio-ethanol production from agricultural residues: Development of process for co-fermentation of hexose and pentose sugars of agricultural residues' has been completed that identifies the thermo-tolerant yeast for bio-ethanol production, process optimization and upscaling of the process.
- Project on hydro-processing of non-edible vegetable oil using biomass derived catalyst has also been completed that provides feasible routes for conversion of lipid to biocrudes and subsequent distillates in the range of gasoline, aviation turbine fuels, kerosene, diesel and wax.
- A project on 'Biogas production and utilization for heat and power generation applications using potential alternative feed-stocks' has been completed at the institute under which different feed-stocks including paddy straw, garden grass, water hyacinth and kitchen waste have been used for biogas production using developed thermophilic consortium.
- A project on 'Biorefining of sugarcane bagasse for production of bioethanol and value-added products' funded by DBT under Indo-Brazil bilateral collaboration with IFSC/USP, Brazil is going on at the Institute.
- A project on 'Biorefinery approach for generation of platform chemicals and bioethanol from indigenous lignocellulosic agro-waste bio-resources' funded by DBT in collaboration with Tezpur University, Assam.
- Project on Biobutanol through a postdoctoral researcher under DST SERB has been taken up.
- Registration of Cook-stove CDM Program of Activity (PoA) at the United Nations (UNFCCC) and Gold Standard (GS) Foundations.
- Establishment of First Ever Testing and Certification Centre at the Institute.
- Design developed for a Natural Draft Improved Biomass Cook-stove having higher thermal efficiency >30% which is under inclusion in the approved models of MNRE.
- The Institute has launched an In-house Journal "Indian Journal of Biofuels and Bioenergy" since 2015. The 4th Issue of the journal has been published.
- The Institute was awarded Global Environmental Award, 2015 by 6th WRETC-2015, New Delhi.
- A society namely 'Bio-Energy Alliance' has been registered under the Societies Registration Act, 1860."

8.23 On being asked about the financial allocation vis-à-vis utilization during the previous years, the Ministry furnished the following details:

(Rs in lakhs)

Budget Head	2015-16	2016-17	2017-18
A. GIA-General	460.00	NIL	50.00
B. GIA-Capital	-	NIL	50.00
C. GIA-Salary	100.00	NIL	100.00*
Total	**560.00**	**NIL**	**200.00**

8.24 When inquired about the financial allocation for the year 2018-19, the Ministry stated that the Budget allocation for 2018-19 is 3 crore.

PART –II

OBSERVATIONS/RECOMMENDATIONS OF THE COMMITTEE

Budget Allocation and Utilization

1. The Committee observe that the Gross Budgetary Support has been decreased at RE stage for the last two years i.e. 2016-17 and 2017-18. However, the Committee appreciate the Ministry for its efforts to mobilize extra funds through IEBR. The Committee also observe that for the last two years, the Ministry has not been able to fully utilize the allocated amount. It is found that the Ministry could utilize only 63%, 65% and 70% of the total fund allocation during the years 2015-16, 2016-17 and 2017-18 (upto December, 2017) respectively.

The Committee feel that given the ambitious targets to be achieved by the Ministry, such low utilization of allocated funds is beyond comprehension and is indicative of poor financial planning by the Ministry leading to sub-optimal fund utilization. Therefore, the Committee recommend that:

i) The Ministry should focus on proper and exhaustive utilization of allocated funds so as to achieve the given targets and take corrective steps against reasons responsible for low utilization of funds.

ii) The Committee would also like to be apprised of remedial measures adopted in this regard.

Physical Targets and Achievements

2. The Committee are concerned to note that the Ministry has continuously failed to achieve its yearly targets. For the year 2016-17, against the Grid connected Renewable Power target of 16,600 MW, the Ministry could achieve only 11,303.70 MW. Similarly, for the year 2017-18, against the Grid connected Renewable Power target of 14,555 MW, the Ministry has achieved 5602.65 MW till December, 2017 i.e. 8952.35 MW is still left to be achieved in just three months. The Committee are highly skeptical about the achievement of physical targets for the year 2017-18.

The Committee feel that year-on-year non-achievement of the physical targets will derail the entire Mission of achieving 175 GW by 2022. Such performance reflects poorly on the seriousness and commitment of the Ministry to achieve the given targets. The Committee are highly dissatisfied with the performance of the Ministry. The committee, therefore, recommend that:

i) The Ministry should identify weak areas on the basis of its performance during the previous years and take corrective measures without any further delay.

ii) The Ministry should also work towards proper and continuous monitoring of the implementing agencies.

<u>Financial Support from National Clean Energy Fund (NCEF)</u>

3. The Committee note that from the financial year 2011-12 to 2016-17, an amount of Rs. 17,086.24 crore was allocated to MNRE from NCEF and for the year 2017-18, an amount of Rs. 5341.70 crore was given from NCEF. But, the Committee are informed that from the year 2018-19, there will be no fund allocation from NCEF as the same would be utilized to compensate the States for the potential losses on account of GST implementation. The Committee also note that 52 Renewable Energy Projects with a total Viability Gap Funding (VGF) of Rs. 34,503.79 crore have been recommended for NCEF support.

Keeping in view the discontinuation of support from NCEF, the Committee recommend that:

i) The Ministry should make concerted efforts to mobilize additional funds through Government of India serviced/Masala Bonds, Multilateral Financial Organizations, etc.

ii) The Committee would also like to know about the status of 52 Renewable Energy Projects that had been recommended for NCEF support.

Effect of GST on Renewable Energy Sector

4. The Committee note that the Renewable Energy devices and spare parts for their manufacture have been kept in 5% GST slab. However, the Committee are informed that a lot of confusion is prevailing and considerable difficulties are being experienced in the actual implementation of GST on Renewable Energy Sector. It was expected that the GST for all equipments utilized in Solar Projects would be 5 %. But, the Committee were apprised that there will be different GST rates for various components of the Solar Projects. The Committee find that GST rates for the Renewable Energy Sector differ from 5 % on Solar Modules to 18 % on Inverters to 28 % on Batteries.

There are apprehensions that applicable rate of GST on Solar Power Generating System which is not a "Good" bought and sold in the market, would actually be 18% under "work-contract" rather than intended 5%. Similarly, in case of solar power developer himself being an EPC contractor, he will not get the benefit of 5% GST on Solar Power generating System as his final product is "Electricity" which is exempted from GST. There is also an issue of refund of input tax credit leading to higher working capital requirement.

The Committee are of the opinion that this prevailing confusion regarding applicability of GST rate and uncertainty over refund of input tax credit are not healthy for the Renewable Energy Sector. Such a situation will lead to increase in generation cost and pose a threat to the viability of the ongoing projects, ultimately hampering the target achievement. The Committee want the Ministry to take up this matter on urgent basis. The Committee, therefore, recommend that the Ministry should raise these issues regarding applicable rate of GST and refund of input tax credit with the Ministry of Finance for necessary clarifications and modifications without any further delay.

Green Energy Corridor

5. The Committee note that under Green Energy Corridor Project, there is a target of establishment of Grid sub-stations of different voltage levels with aggregate transmission capacity of approx. 19000 MVA (Mega Volt Ampere)

and installation of over 8500 ckt-kms (Circuit kilometres) of transmission lines in the states of Andhra Pradesh, Gujarat, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Tamil Nadu with funding mechanism consisting of 40% NCEF Grant, 40% KfW loan (EUR 500 Million) and the remaining 20 percent as State contribution. It has been submitted that the project would be completed by March 2020. The Committee also note that as on December 31, 2017, works related to installation of transmission towers and its stringing for aggregate 1100 ckt-kms have been completed (commissioning is pending).

It can be deduced from the data provided, that to meet the given target, 7400 ckt-kms of transmission lines have to be installed in just two years i.e. upto March 2020. The Committee know that for 2017-18, the Ministry was provided Rs. 500 crore (BE) for Green Energy Corridor with a physical target of 350 ckt-kms. But, the data related to physical and financial achievements under Green Energy Corridor Projects for 2017-18, has not been furnished.

The Committee observe that for 2018-19, an allocation of Rs. 600 crore (BE) has been made for Green Energy Corridor with a physical target of 3000 ckt-kms (cumulative). It means that 1900 ckt-kms of transmission lines have to be installed during 2018-19. The Committee feel that there is mismatch between the fund allocated and physical targets set, as for 2017-18, Rs. 500 crore were provided for installation of 350 ckt-kms of transmission lines and for 2018-19, Rs. 600 crore have been allocated for installation of 1900 ckt-kms of transmission lines (target for 2018-19 is more than five times the target for 2017-18 while corresponding budgetary increase is only one-fifth of previous year). It shows the unrealistic assessment of financial requirement and corresponding physical targets by the Ministry. The Committee feel that there should be some cohesion and correlation between physical and financial targets for achievement of Green Energy Corridor.

Further, the cumulative target of achieving 3000 ckt-kms of transmission lines by March 2019, leaves 5500 ckt-kms of transmission lines to be installed during 2019-20, so as to get installed stipulated 8500 ckt-kms

of Green Energy Corridor by March 2020. The Committee are highly apprehensive about the target achievement with respect to the Green Energy Corridor as the target seems unattainable during the remaining period. The Committee, therefore, recommend that the Ministry should work on mission mode to get ready the Green Energy Corridor within the stipulated time if they are serious about the Project.

<u>Demands for Grants of the Ministry for 2018-19</u>

6. The Committee note that an amount of Rs. 5472.84 crore was allocated to the Ministry for 2017-18 which was reduced to Rs. 4080 crore at the RE stage. The Committee feel that a reduction of Rs. 1392.84 crore at the RE stage is not in sync with the humongous targets assigned to the Ministry. Further, an allocation of Rs. 5843.96 crore was sought by the Ministry for 2018-19, but, Rs. 5146.63 crore have actually been sanctioned i.e. Rs. 697.33 crore less than the required amount. The Committee are informed that some additional funds will be required which will be assessed and sought at the RE stage.

Keeping in view the allocation of less than required amount and the high targets assigned to the Ministry, the Committee recommend that additional funds should be provided to the Ministry at RE stage.

7. The Committee note that for 2018-19, the physical targets assigned to the Ministry include 15,620 MW of Grid Interactive Renewable Power, 3000 ckm (cumulative) of Green Energy Corridor, 500 number of Water Mills, 1 Lakh Bio-Gas Plants, etc., with an allocation of Rs. 3762.50 crore for Grid Interactive Renewable Power and Rs. 1036.50 crore for Off-Grid/Distributed/Decentralized Renewable Power.

The Committee hope that the Ministry will achieve the targets set for the year 2018-19, unlike the previous years. The Committee, therefore, recommend that the Ministry should analyse its past performance and make all out efforts to achieve the envisaged targets. The Committee may be apprised of the analysis done and lessons learnt from the previous years' performance of the Ministry.

Wind Energy

8. The Committee note that the Wind Power Potential in the country at 100 meter above ground level, as assessed by the National Institute of Wind Energy, is 302 GW. Against this, a total capacity of 32848.46 MW has reportedly been installed as on December 31, 2017. The Committee congratulate the Ministry for its performance in the Wind Energy Sector during the years 2015-16 and 2016-17, wherein against the targets of 2400 MW and 4000 MW, Wind Energy capacity of 3423 MW and 5502 MW, respectively, have been achieved. However, the Ministry has not been able to keep up the momentum as its performance in 2017-18 is not up to the mark, i.e. against a target of 4000 MW, only 597.91 MW capacity has been installed (as on January 31, 2018). It means the achievement is even less than 15% of the target. The budget allocated for each of the three years i.e. 2015-16, 2016-17 and 2017-18, has reportedly been fully utilized.

The Committee are informed that, for the year 2018-19, a physical target of 4000 MW has been set with a budgetary allocation of Rs. 750 crore which also includes past liability regarding Generation Based Incentive Scheme. The Committee observe that in 2017-18, the Ministry has managed to achieve only 15 % of the target with full utilization of Budgetary allocation of Rs. 400 crore, so the Committee feel that more funds should be made available for this Sector. Keeping in view the proposed cumulative bid of about 10,000 MW of Wind Power during 2018-19, the Committee recommend that:

i) The Ministry should seriously pursue for more fund allocation so as to ensure that implementation of the Wind Energy Projects does not suffer for want of funds.

ii) The Ministry should make concerted efforts to achieve the physical target of 4000 MW wind energy capacity for the year 2018-19 in a time bound manner.

iii) The Ministry should look into the reasons responsible for non-achievement of the physical target in 2017-18 and take corrective

measures for the same. The Committee may be apprised of the reasons and corrective measures taken in this regard.

9. The Committee note that there are 21 manufactures in Wind Energy Sector who manufacture Single turbine models of upto a capacity of 3 MW and the current annual production capacity of domestic wind turbine industry is around 10,000 MW. The Committee congratulate the Ministry for the fact that indigenization of wind turbine manufacturing has reached up-to 70% and cost of Indian wind turbines is among lowest in the world.

The Committee are informed that the Ministry has been trying to exploit the Off-Shore Wind Resources with a plan to install 5-10 GW of capacity by 2022. The Committee also note with satisfaction that a scheme for installation of Wind-Solar Hybrid Projects is being formulated and first the Wind-Solar Hybrid Park of 160 MW will come up in Andhra Pradesh. The Committee are of the opinion that Wind and Solar are complementary and hybridizing these two technologies would help in minimizing the variability apart from optimally utilizing the infrastructure, including land and transmission system.

The Committee feel that these new initiatives will diversify the Ministry's resources and work as a cushion against any shortfall in already planned capacity so as to achieve 175 GW of installed Renewable Energy Capacity in time. The Committee, therefore, recommend that:

i) The Ministry should take forward the lead achieved in Wind Energy Manufacturing and strive for maximum indigenization of Wind Turbines Manufacturing.

ii) The Ministry should expeditiously complete the Off-Shore Wind Power Assessment Studies and Surveys related to techno-commercial feasibility and grid infrastructure requirement for Off-Shore Wind Projects.

iii) The Ministry should finalize the Wind–Solar Hybrid Policy as early as possible.

Solar Energy

10. The Committee note that according to the planned year wise trajectory of the Ministry to achieve 100 GW of Solar Energy by 2022, there should have been 32,000 MW of installed Solar Capacity by 2017-18, against which, a capacity of 18,454.97 MW has been installed in the country (as on January 31, 2018). The Committee feel that the Ministry have a huge task before them to install remaining 81,545 MW of Solar Energy Capacity in just four years so as to meet the stipulated target of 1,00,000 MW Solar Energy Capacity by 2022, with an average of more than 20,000 MW per year. The Committee are informed that the Ministry has finalized a year-wise trajectory for bidding of Solar Power Projects with planned tenders of 30,000 MW each in 2018-19 and 2019-20.

The Committee observe that for the year 2017-18, against the target of 10,000 MW of Grid-connected Solar Power, the Ministry has been able to achieve only 6166.15 MW (as on January 31, 2018) with utilization of Rs. 951.93 crore i.e. the achievement is about 40 % short of the target. For the year 2018-19, a physical target of 11,000 MW for Grid-connected Solar Power has been planned with an allocation of Rs. 2045.25 crore. The Committee are also informed that availability of finance is not an issue, as most of the investment is met by the private solar developers and the Ministry has reportedly been playing a facilitator role in respect of major schemes like solar park scheme and VGF schemes.

The Committee find that the Ministry has continuously been missing on its yearly Solar Energy Capacity Addition targets, so the Committee are dissatisfied with the performance of the Ministry in Solar Energy Sector and feel that with such performance, the target of 100 GW will be very hard to achieve. The Committee, therefore, recommend that:

i) The Ministry should work hard so as to achieve the target of 11,000 MW set for the year 2018-19.

ii) The Ministry should play a proactive role in monitoring the progress of various Solar Energy Projects.

iii) The Ministry should also ensure that Solar Energy Projects are not affected due to lack of adequate financial resources.

iv) 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 concerned in a time bound manner.

11. The Committee note that NISE has estimated a Roof-top SPV potential of 42.8 GW. Accordingly, a target of 40 GW of installed Roof-top Solar Power by 2022 has been set by the Government. The Committee observe that as per the year-wise targets set by the Ministry so as to install 40 GW by 2022, there should have been an installed Roof-top Solar Power (RTS) Capacity of 10,000 MW by 2017-18. But, as on February 06, 2018, only 953 MW of RTS Capacity has reportedly been installed i.e. the achievement is only 9.53 % of the target. The Committee are highly disappointed with the performance of the Ministry in this Sector.

The Committee feel that Roof-top Systems are not remunerative for the consumers due to high maintenance cost and delay in disbursement of subsidy. The Committee are of the opinion that, given the performance of the Ministry in this Sector till date, the Roof-top Solar target of 40 GW by 2022 is unrealistic and it is highly unlikely that this target will be met. The Committee are of the considered view that the Ministry should give this programme a serious relook, otherwise it will derail the entire National Solar Mission. The Committee, therefore, recommend that:

i) The process of subsidy disbursement should be made simpler and faster. Alternatively, the Ministry may explore the feasibility of the mechanism wherein the consumer will need to pay the cost minus subsidy.

ii) The Ministry should make arrangements so that the cost payable by the consumer may be recovered through monthly installments as people are generally reluctant to invest the whole amount at a time.

iii) Single Window Clearance System should be adopted for approvals like connectivity, net-metering, electricity inspection, limitation in sanctioned load, etc.

iv) The Ministry should undertake regular review meetings with the implementing agencies.

12. The Committee note that there are 1,47,527 units of Solar Pumps installed in the country (as on December 31, 2017) and there is a proposal to install 1.5 lakhs Solar Pumps during the period 2017-20. Further, the Committee are informed that a new initiative 'KUSUM' has been announced in Budget 2018-19 to empower farmers by giving them grid connected Solar Pumps. According to this scheme, the farmers can supply the access power to the grid and earn an additional income. The Scheme includes installation of 10,000 MW of Decentralized Ground Mounted Grid Connected Solar Power Plants of intermediate capacity of 0.5–2 MW, installation of 17.50 lakh standalone Solar Powered Agriculture Pumps of capacity upto 7.5 HP, Solarisation of 10 Lakh Grid-connected Powered Agriculture Pumps with support of upto 5 HP capacity and Solarisation of 50,000 Grid-connected tube-wells/lift irrigation and drinking water projects of upto 50 HP capacity.

The Committee appreciate the Government for its efforts to empower farmers. But, the Committee are concerned that already financially constrained DISCOMs may not be able to pay the farmers for the access power supplied to the grid. The Committee are of the opinion that non-payment of dues by the DISCOMs will further alienate the farmers and will definitely have serious repercussions for the Government. The Committee, therefore, recommend that:

i) The Ministry should formulate some mechanism to ensure payment from DISCOMs to farmers. The Committee would like to know about the details of any such mechanism as early as possible.

ii) The Ministry should also ensure quality, sustainability and maintenance of installed Solar Pumps.

13. The Committee note that there is an installed Solar Manufacturing capacity of 3164 MW for Solar Cells and 8398 MW for Solar Modules. The Ministry has submitted that the domestic manufacturers are not competitive at present and they are not able to get enough orders to exploit their entire capacity. The Committee are informed that the reasons for poor domestic manufacturing capacity include lack of integrated set up, high cost of land/electricity, lack of skilled workforce, low capacity utilization, lack of economies of scale, high cost of financing & lack of modern technology resulting in higher cost of production, etc.

The Committee are concerned about the lack of domestic Solar Manufacturing Capacity. The Committee are of the view that it is a necessity for India to support Domestic Solar Manufacturing as over-reliance on a single country puts Indian Solar Sector at a risk of disruption in supply chain. The Committee, therefore, recommend that:

i) The Ministry should urgently formulate a dedicated programme to support Solar Manufacturing in the country.

ii) The Ministry should work to provide Viability Gap Funding (VGF) and low interest rate loans to domestic manufacturers so as to make them competitive.

14. The Committee are informed that Custom Duty on Solar Cells/Modules/Panels has been levied at the rate of 7.5 %. Further, a Safeguard Duty to the tune of 70 % has been recommended. The Committee feel that because of the imposition of Safeguard/Custom Duty, project developers will suffer, though it may be good for domestic manufacturers. Such a duty will result in steep rise in input cost, thereby affecting the viability of existing projects and dampening investors' sentiments.

The Committee agree that there is a need to encourage domestic manufacturing, but, it is hard to believe that domestic manufacturing will reach to the production and efficiency level required to meet the target of 100 GW of Solar Energy in next 2-3 years. So, in the opinion of the Committee, there are no valid grounds to take such emergency measures which having the

potential to cripple the entire Solar Sector. The Committee, therefore, recommend that:

i) Custom Duty on Solar Cells/Modules/Panels should not be levied and they should continue to enjoy exemption from custom duty as before.

ii) Safeguard Duty should not be of the tune that will hamper our own programme and it should not affect the bids which have already taken pace.

<u>Biomass Power and Bagasse Co-generation Programme</u>

15. The Committee note that the estimated potential for power generation from Biomass/Bagasse Co-generation in the country is 25,860 MW. Against this, a cumulative capacity of 8414 MW has reportedly been installed in the country (as on December 31, 2017). The Committee note that the performance in this sector during the last three years has been discouraging *viz*. in 2015-16 and 2016-17, against the targets of 400 MW each, capacities of 305 MW and 162 MW, respectively, have been achieved. However, the performance in 2017-18 has somewhat improved i.e. against the target of 340 MW, 253 MW capacity has been installed (upto January, 2018). The amount allocated for the last three years were Rs. 30 crore, Rs. 17 crore and Rs. 9 crore, respectively, which have not been fully utilized.

The Committee observe that for the year 2018-19, a physical target of 300 MW has been fixed with an outlay of Rs. 15 crore and the Committee are informed that the allocation will not be sufficient to achieve the set target and more funds will be demanded at RE stage. That being so, the Committee are concerned that instead of striving to achieve their stipulated target, the Ministry have continuously reduced it from 400 MW each in 2015-16 and 2016-17 to 340 MW in 2017-18 and further to 300 MW in 2018-19.

The Committee also observe that Biomass Power/Bagasse Cogeneration Sector has been facing problems such as non-signing of PPAs by DISCOMs, lack of working capital and non-availability of biomass which are affecting the progress of the sector. It is also furnished by the Ministry that a large number

of Biomass/Bagasse Projects are not doing well. The Committee, therefore, recommend that:

i) The Ministry should strive hard to ensure full achievement of the physical target for the year 2018-19.

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

iii) The technologies used in the sector should be upgraded and improved, keeping in mind the cost effectiveness and viability of the projects.

Small Hydro Power

16. The Committee note that the identified potential for power generation 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, a cumulative capacity of 4418.15 MW has been installed, with 754.16 MW under various stages of implementation (as on December 31, 2017). The Committee find the performance of the Ministry in this sector has been decreasing year-on-year. During 2014-15, 2015-16 and 2016-17, against the target of 250 MW, 250 MW and 150 MW respectively, a capacity addition of 251.6 MW, 218.6 MW, and 105.9 MW respectively have been installed and the allocated funds during this period have been fully utilized.

Keeping up with the declining trend, during the year 2017-18, against the target of 100 MW, 73.80 MW could be achieved and against the budgetary allocation of Rs. 123.50 crore, Rs. 95.33 crore have been utilized (upto January, 2018). The Committee observe that for the year 2018-19, the budgetary allocation has been increased to Rs. 218.50 crore with a physical target of 250 MW. The Committee are also apprised that the National Mission on Small Hydro has been dropped. The Committee, therefore, 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) Hydro Projects with the capacity of more than 25 MW should be considered as Renewable Projects.

Renewable Energy for Rural Applications

17. The Committee are informed that Renewable Energy for Rural Applications includes the National Bio-Gas and Manure Management Programme (NBMMP) and Bio-Gas based Power Generation (0ff-Grid) Programme. The Committee observe that from the year 2014-15 to 2017-18, allocation for this Sector has been considerably reduced and the Ministry has consistently failed to achieve its financial and physical targets. During the year 2017-18, against the Financial Allocation (RE) of Rs. 94 crore, only Rs. 44.58 crore (47.42%) have been utilized and against the physical target of 65,180 Bio-Gas Plants, the Ministry has been able to set up only 22,000 such plants (~34%). The Committee feel that the performance of the Ministry is discouraging in this sector. The Committee are informed that the non-achievement of Bio-Gas target is due to drought conditions during the years 2014-15 and 2015-16, high upfront cost of biogas plants, reduced subsidy support, lack of priority at state level, impact of Ujjawala Scheme, low publicity of the programme by the implementing agencies, etc.

The Committee note that for the year 2018-19, a budgetary allocation of Rs. 135 crore has been made for Bio-Gas under Off-Grid Renewable Power with physical target of 1 lakh Bio-Gas Plants. It has been submitted that the Budgetary allocation of 2018-19 in respect of Off-Grid/Distributed and Decentralized Renewable Power includes Biogas as Biogas has been merged under Off-Grid/Distributed and Decentralized Renewable Power. The

Committee are of the view that apart from electricity generation, Bio-Gas Plants help millions of rural folk by meeting their cooking and other energy requirements. The Committee, therefore, recommend that:

i) The Ministry should focus on the feasibility, affordability and availability of the new technologies for 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.

<u>Renewable Energy for Urban, Industrial and Commercial Applications</u>

18. The Committee note that the programmes under the head 'Renewable Energy for Urban, Industrial and Commercial Applications' include Energy efficient Solar/Green Buildings Programme; Energy from Urban, Industrial and Agricultural Waste and Bio-Energy and Cogeneration in Industry. On scrutiny of the data provided for Waste to Energy Programme, the Committee observe that the target during the last two years i.e. 2016-17 and 2017-18, was 25 MW each, against which 13.07 MW and 7.62 MW respectively, have been achieved. Further, against the financial allocation of Rs. 25.50 crore and Rs. 28.50 crore, Rs. 7.32 crore and Rs. 13.21 crore respectively were utilized during the same period. The Committee find that performance in Waste to Energy Sector is not up to the mark, both in financial as well as physical terms.

The Committee are informed that the Ministry supported 180 waste-to-energy plants based on Municipal Solid Waste (MSW), Urban, Industrial and agricultural waste/residues for generation of power, biogas and bio-CNG. But, these Plants, reportedly, are not doing well in terms of viability and profitability, due to various reasons. The Committee note that for 2018-19, a budgetary allocation of Rs. 22 crore with a physical target of 20 MW has been assigned for Waste to Energy Programme. The Committee have been apprised that 30 new projects with a cumulative capacity of about 40 MWeq have already been sanctioned and these projects are expected to be installed and

commissioned during the year 2018-19. The Ministry has assured the Committee that the target set for 2018-19 would be fully achieved. The Committee, therefore, recommend that:

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

ii) The Ministry should encourage States/Municipal Corporations and other stakeholders to develop suitable proposals for recovery of Energy from Urban, Industrial and Agricultural Wastes.

<u>Research, Design, Demonstration and Development in Renewable Energy Sector</u>

19. The Committee note that Budgetary Allocation under RDD&D for the years 2016-17 and 2017-18 were reduced at RE stage i.e. in 2016-17, BE of Rs. 445 crore was reduced to Rs. 272.85 crore at RE and in 2017-18, BE of Rs. 144 crore was reduced to Rs. 81 crore at RE stage. It is found that even the reduced amount could not be fully utilized. Regarding the major programmes/ research activities undertaken 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. The Committee note that an amount of Rs. 94.00 crore has been allocated under RDD&D for the year 2018-19. The Committee are informed that during the year 2018-19, thrust will be on development of solar thermal technology, improving Si PV efficiency, storage solutions, development of efficient and cost effective designs of biogas plants, off-shore technology and wind solar hybrid system, pumped storage systems, technology for storage and development of efficient and cost effective fuel cells, etc. The Committee, therefore recommend that:

i) The Ministry should focus on maximum utilization of allocated funds so that Research, Design, Demonstration and Development in Renewable Energy Sector do not suffer due to low utilization of sanctioned amount.

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

iii) 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.

<u>PSUs/Institutions under the Ministry</u>

20. The Committee are informed that to support the Ministry, there are five PSUs/Institutions - Indian Renewable Energy Development Agency (IREDA), Solar Energy Corporation of India (SECI), National Institute of Solar Energy (NISE), National Institute of Wind Energy (NIWE), and National Institute of Bio Energy (NIBE). The Committee note that NISE serves as the technical focal point for Solar Energy Research & Development, NIWE serves as the technical focal point for Wind Power Research & Development, NIBE focuses on Research & Development in Bio Energy, SECI assists the Ministry and functions as the implementing and executing arm for the Jawaharlal Nehru National Solar Mission and IREDA provides term-loans for Renewable Energy and Energy Efficiency Projects. The Committee note that the Ministry has not given exhaustive data regarding financial allocation vis-à-vis utilization, physical targets vis-à-vis achievements, etc. with respect to these PSUs/Institutions. The Committee, therefore, recommend that the Ministry should furnish the relevant data w.r.t. these Institutions/PSUs as soon as possible. Based on the scanty data provided, the Committee have made some observations about the performance of these PSUs/Institutions in the succeeding paragraphs.

21. After scrutiny of the data provided, the Committee feel that the performance of IREDA has been good as it has outperformed on most of the parameters except on NPA related parameter. Its MoU Rating as "Excellent" speaks for itself. The Committee, therefore recommend that IREDA should work towards reducing its NPA in accordance with the target set.

22. The Committee note that SECI, during the year 2017-18, has issued tenders of 3975 MW of Solar Ground Mounted Projects and 5000 MW of Wind Energy Projects and during the same year, a capacity of 830 MW of Solar Ground Mounted Projects has actually been commissioned. The Committee note that SECI received Rs. 92 crore, 100 crore and 50 crore during 2015-16, 2016-17 and 2017-18 respectively. However, data related to fund utilization during the same period, has not been furnished. It has been submitted that for the year 2018-19, SECI has not sought any equity support from the Ministry as the new projects to be undertaken in the year 2018-19 will be carried out from its internal resources. SECI has a target to issue tenders for 18,000 MW of Solar Projects and 10,000 MW of Wind Projects and Award placement for 160 MW of Solar-Wind Hybrid Project, during 2018-19, which according to the Committee is substantially high as compared to the achievement of previous year. The Committee, therefore, recommend that:

i) Being the implementing and executing arm for the National Solar Mission, SECI should make more efforts towards achieving its targets as it has really huge targets to achieve.

ii) SECI should furnish data related to its physical and financial performance to this Committee on regular basis.

23. The Committee note that major achievements of NISE during the last three years include establishment of inverter test laboratory, creation of automatic water pumping testing facility, creation of Concentrating Solar Technologies (CST) test facility, development of solar powered Drinking RO system based Water ATM, development of Solar Milk Chilling Plant, implementation of Suryamitra Skill Development programme, etc. The Committee observe that NISE has not been able to fully utilize the allocated amount, especially during 2014-15 and 2016-17. Fund allocation/utilization data for 2017-18, have not been furnished. The Committee also note that for 2018-19, an amount of Rs. 18.00 Crore has been allocated to the NISE. The Committee are informed that if all the activities planned are taken up, the

allocated funds will not be sufficient. The Committee, therefore, recommend that:

i) More funds should be provided to NISE so that its proposed activities/projects may be carried out as planned.

ii) NISE should take up research projects for increasing the efficiency of Solar Cells and development of storage system.

iii) NISE should furnish data related to its physical and financial performance to this Committee, on regular basis.

24. The Committee note that major activities at NIWE during the last few years include on-shore Wind and Solar Resource Assessment, Offshore Wind Assessment, trainings on Wind Energy Tech & Applications, testing of Wind Turbines, etc. The Committee find that fund utilization by NIWE, during the last few years i.e. 2014-15, 2015-16 and 2016-17 has been poor. The Committee are informed that for the year 2018-19, a sum of Rs. 20 crores has been approved and additional fund will be sought during RE stage. The Committee, therefore, recommend that:

i) NIWE should take corrective steps 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.

ii) The Committee should be apprised of corrective steps taken in this regard.

25. The Committee note that the activities/projects undertaken by NIBE during the last few years include development of facilities for R&D in bio-fuel, biogas and cook stove, downstream processing of bio-fuel (ethanol, biodiesel, green diesel, bio-petrol, butanol etc.) as partial substitute of petroleum, biomass resource assessment, skill development programmes, project on hydro-processing of non-edible vegetable oil, project on 'Bio-refining of sugarcane bagasse, etc. The Committee observe that the financial allocation to NIBE has been fluctuating i.e. for 2015-16, the Institution was given Rs. 5.60

crore, there was no allocation for 2016-17 and Rs. 2 crore were provided for 2017-18. Reasons for such fluctuation and data related to year-wise utilization of the sanctioned amount have not been furnished. The Committee are informed that for 2018-19, the budget allocation is Rs. 3 crore. The Committee, therefore, recommend that:

i) NIBE should work towards making Bio-Gas/Bagasse Power Plants sustainable and viable through appropriate technological development.

ii) Data related to year-wise utilization of the sanctioned fund should be furnished to the Committee at the earliest.

NEW DELHI
March 09, 2018
Phalguna 18, 1939 (Saka)

DR. KAMBHAMPATI HARI BABU,
Chairperson,
Standing Committee on Energy

Details of the Budget Estimates for the year 2018-19 vis-à-vis BE/RE of 2017-18 and Actuals of 2016-17

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, 2019 को समाप्त होने वाले वर्ष में व्यय के लिये आवश्यक धनराशि का अनुमान।
i. Estimates of the amount required in the year ending 31st March, 2019 to defray charges in respect of **MINISTRY OF NEW AND RENEWABLE ENERGY**

	राजस्व Revenue	पूंजी Capital	जोड़ Total	(₹ करोड़) (Rs. ₹ crores)
भारित Charged	...	...	...	
मतदान Voted	5106.23	40.40	5146.63	

ii. शीर्ष जिसके अन्तर्गत **नवीन तथा नवीकरणीय ऊर्जा मंत्रालय** की ओर से इस अनुदान का हिसाब दिखाया जायगा।
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 2016-2017 Actuals	बजट अनुमान 2017-2018 Budget Estimates	संशोधित अनुमान 2017-2018 Revised Estimates	बजट अनुमान 2018-2019 Budget Estimates
राजस्व भाग	***REVENUE SECTION***					
सचिवालय- आर्थिक सेवाएं	Secretariat-Economic Services	3451	34.61	36.54	39.40	40.03
पूर्वोत्तर क्षेत्र	North Eastern Areas	2552	...	525.00	394.00	604.53
नवीन तथा नवीकरणीय ऊर्जा	New and Renewable Energy	2810	7608.91	10163.00	7588.60	4561.67
जोड़ - राजस्व भाग	**Total-Revenue Section**		**7643.52**	**10724.54**	**8022.00**	**5106.23**
पूंजी भाग	***CAPITAL SECTION***					
नवीन तथा नवीकरणीय ऊर्जा पर पूंजी परिव्यय	Capital Outlay on New and Renewable Energy	4810	110.63	90.00	51.00	40.40
जोड़ - पूंजी भाग	**Total-Capital Section**		**110.63**	**90.00**	**51.00**	**40.40**
कुल जोड़	***GRAND TOTAL***		***7754.15***	***10814.54***	***8073.00***	***5146.63***

टिप्पणी: उपरोक्त अनुमानों में नीचे दिखाई गई वसूलियां शामिल नहीं हैं, जिन्हें व्यय में से घटा कर व्यय आंकों 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	-3825.19	-5291.70	-3943.00	...
जोड़ - राजस्व भाग	**Total-Revenue Section**		**-3825.19**	**-5291.70**	**-3943.00**	...
पूंजी भाग	***Capital Section***					
नवीन तथा नवीकरणीय ऊर्जा पर पूंजी परिव्यय	Capital Outlay on New and Renewable Energy	4810	-100.00	-50.00	-50.00	...
जोड़ - पूंजी भाग	**Total-Capital Section**		**-100.00**	**-50.00**	**-50.00**	...
जोड़ - वसूलियां	***Total Recoveries***		***-3925.19***	***-5341.70***	***-3993.00***	...

उपरोक्त वसूलियों को घटा कर व्यय व्यवस्था इस प्रकार होगी:

The expenditure provisions, net of the above recoveries, will be as under:

राजस्व	Revenue	3818.33	5432.84	4079.00	5106.23
पूंजी	Capital	10.63	40.00	1.00	40.40
जोड़	**Total**	**3828.96**	**5472.84**	**4080.00**	**5146.63**

ANNEXURE-II

DETAILS OF SOLAR POWER TARIFFS DISCOVERED THROUGH BIDDING
National Solar Tariff

Previous bid results						
Sl. No		**Year**	**Capacity on Offer (MW)**	**Highest Bid (Rs./KWh)**	**Lowest (Rs./KWh)**	**Weighted Avg. Price (Rs./KWh)**
1.	Punjab (Capacity 5-24 MW)	Feb'15	100	7.45	6.88	7.17
2.	Punjab (Capacity 25-100 MW)	Feb'15	100	7.56	6.88	7.16
3.	NTPC Anantapur(CPSU scheme)	May'15	250	-	-	6.16* (L1)
4.	Uttar Pradesh Phase 2	June'15	215	8.6	7.02	8.04
5.	Madhya Pradesh	June'15	300	5.641	5.051	5.36
6.	Telangana Group 1**	August'15	500	5.8727	5.4991	5.73
7.	Telangana Group 2**	August'15	1500	5.8877	5.1729	5.62
8.	Punjab	Sept'15	500	5.98	5.09	5.65
9.	Uttarakhand	Oct' 2015	170	5.99	5.57	5.766
10.	AP-500 MW Bundling scheme	Nov'2015	500	4.63	4.63	4.63
11.	AP-350 MW Bundling scheme	Dec'2015	350	4.63	4.63	4.63
12.	AP-150 MW Bundling scheme(DCR)	Dec'2015	150	5.13	5.12	5.123
13.	Haryana(State scheme)	Dec'2015	150	5.00	5.00	5.00
14.	Rajasthan-420 MW Bundling	Jan'2016	420	4.36	4.34	4.351
15.	UP-100 MW Bundling	Jan'2016	100	4.78	4.78	4.78
16.	Rajasthan-100 MW Bundling(DCR)	March'16	100	5.07	5.06	5.068
17.	Telangan-50 MW Bundling(DCR)	March'16	50	5.19	5.19	5.19
18.	Jharkhand-200	March'16	102	5.59	5.20	5.464
19.	Jharkhand-1000	March'16	999	5.48	5.08	5.356
20.	Telangan-350 MW Bundling	May'16	350	4.67	4.66	4.667
21.	Karnataka-500 MW Bundling	May'16	500	4.80	4.78	4.79
22.	KA-100 MW bundling(DCR)	Sept-16	100	4.86	4.84	4.85
23.	MP-750 MW(State scheme)	Feb-17	750	2.979	2.970	2.9743# (3.30 Level tariff)
24.	AP-250 MW(Bundling)	April-17	250	3.15	3.15	3.15

25.	Rajahthan-250 MW(VGF) Bhadla-IV	May-17	250	2.63	2.62	2.624
26.	Rajahthan-500 MW(VGF) Bhadla-III	May-17	500	2.45	2.44	2.446
27.	Tamil Nadu-1500 MW(State scheme)	July-17	1500	3.97	3.47	3.47##
28.	Gujarat-500 MW	Aug-17	500	2.67	2.65	2.665
29.	NTPC-250 MW(DCR)	Oct-17	250	3.14	3.14	3.14
30.	Rajahthan-500 MW(VGF) Bhadla-III	Dec-17	500	2.48	2.47	2.474
31.	Rajahthan-250 MW(VGF) Bhadla-IV	Dec-17	250	2.49	2.48	2.482
	* EPC Bids with Domestic content requirement. Capital subsidy of Rs. 1 Cr/MW **Results for the lowest bid for 500 and 1500 MW respectively. # escalation of 5 paisa from 2 nd year to 15th year ## All the bidders showed willing to sign the PPA at Rs.3.47/unit(lowest tariff)					

ANNEXURE-III

Subsidies/support in terms of Central Financial Assistance (CFA) given by the Government for installation of Solar Projects

Sr. No.	Scheme	Central Financial Assistance/Subsidy
1.	Scheme for Development of Solar Parks and Ultra Mega Solar Power Projects	• Rs.20 lakhs/MW or 30% of the project cost including Grid-connectivity cost, whichever is lower • CFA @ Rs 25.00 lakh per park for DPR preparation of solar parks, conducting surveys, etc.
2.	Operationalization of 300 MW Solar PV Projects by defence establishment and para military forces	• The bidders selected on the basis of bids for minimum VGF requirement for the project with commitment to supply solar power at Rs. 5.50/KWh for 25 years. • The upper limits of the VGF are as follows: (i) Category-I:Rs.2.5 crore/MW for project capacity up to 5 MW or 30% of the project cost whichever is lower; (ii) Category-II: Rs. 2 crore/MW for project capacity greater than 5 MW up to 25 MW or 30% of the project cost whichever is lower; and (iii) Category-III: Rs. 1.5 crore /MW for project capacity greater than 25 MW or 30% of the project cost whichever is lower. Keeping in view the technology upgradation and economies of scales, the upper limit of VGF was revised on 17.02.2017 to @ Rs. 1.10 Cr./MW for all projects irrespective of sizes for which tenders were not brought out.
3.	Scheme for Setting up of 750 MW Grid-connected Solar PV Power Projects under Batch-1 of Phase-II of JNNSM with Viability Gap Funding Support	The selection of the bidders has been based on the Viability Gap Funding (VGF) required for the project in an ascending order upto the full capacity. Viability Gap Funding (VGF) is limited to 30% of the project cost or 2.5 crore per MW, whichever is lower. Solar Energy Corporation of India (SECI) has signed PPA with such project developers for purchasing entire power from the project for 25 years at 5.45 Rs. per unit (4.75 Rs. per unit for projects availing accelerated depreciation).
4.	Scheme for Setting up of 2000 MW Grid-connected Solar PV Power Projects under Batch-III of Phase-II of JNNSM with Viability Gap Funding Support	The Project developer is provided a viability gap funding based on his bid. The upper limit for VGF is kept at Rs.1.0 Crore/MW for open category (Rs. 1.31 Crore/MW for projects in DCR category).
5.	Scheme for Setting up of 5000 MW Grid-connected Solar PV Power Projects under Batch-IV of Phase-II of JNNSM with Viability Gap Funding Support	The Project developer is provided a Viability Gap Funding based on his bid. The upper limit for VGF is kept at Rs. 1.0 crore/MW for open category and Rs. 1.25 crore/MW for projects in DCR category. SECI will select projects through competitive e-bidding based on minimum VGF sought (quoted in INR/MW), or there may be a provision for quoting a discounted tariff (quoted in INR/kWh).
6.	Grid Connected Rooftop	CFA is 30% of the benchmark cost for general and 70% CFA for North Eastern and Special Category States for residential, social and institutional sector.
7.	Pilot-cum-demonstration project for development of grid	• Financial support of Rs.3 crore/MW or 30% of the project cost, whichever is lower, for Canal Top SPV projects and

	connected solar PV power plants on canal banks and canal tops	Rs. 1.5 crore/MW or 30% of the project cost, whichever is lower, for Canal Bank SPV projects. • Total CFA of upto Rs.225 crore for *100 MW (50 MW on Canal Tops and 50 MW on Canal Banks)* to be disbursed over a period of maximum 2 years post sanctioning of the plants as under: – upto 40% on sanctioning of the projects. – 60% on successful commissioning of the projects. • Service charge to SECI @1% of project cost.
8.	Scheme for setting up of 1000 MW of Grid-Connected Solar PV Power projects by Central Public Sector Undertakings (CPSUs) under Batch- V of Phase II of JNNSM	• Viability Gap Funding (VGF) provided through SECI at a fixed rate of Rs. 1 Cr/ MW for projects where domestically produced cells and modules are used and Rs. 50 lakh/ MW in cases where domestically produced modules are used. • VGF released in two tranches as follows: (i) 50% on successful commissioning of the full capacity of project (COD). (ii) Balance 50% after one year of successful operation of the project.
9.	Off-Grid scheme- SPV lighting systems and power plants, Solar Pumps	1. Lighting Systems A. Home lights/Lanterns/Street Lights with Lead acid batteries: Benchmark Cost = Rs. 340/Wp: CFA=Rs. 102/Wp B. Street lights with Lithium Ferro Phosphate batteries: Benchmark cost= Rs. 475/Wp: CFA= Rs. 142.5/Wp 2. Power packs with battery bank @7.2 VAh/Wp A. Up to 300 Wp: Benchmark Cost = 200/Wp: CFA=Rs. 60/Wp B. 300 Wp to 1 kWp: Benchmark Cost = Rs. 135/Wp: CFA=Rs. 40.5/Wp 3. Solar Power plants with battery bank @7.2 VAh/Wp and capacity up to 10 kWp: Benchmark Cost = Rs. 135/Wp: CFA=Rs. 40.5/Wp 4. Solar Pumps A. Up to 3 HP (DC): Benchmark Cost = Rs. 1,20,000/HP: CFA=Rs. 30,000/HP B. 3HP to 5 HP (DC): Benchmark Cost = Rs. 95,000/HP: CFA=Rs. 19,000/HP C. Up to 3 HP (AC): Benchmark Cost = Rs. 1,00,000/HP: CFA=Rs. 25,000/HP D. 3HP to 5 HP (AC): Benchmark Cost = Rs. 85,000/HP: CFA=Rs. 17,000/HP

ANNEXURE –IV

STANDING COMMITTEE ON ENERGY

MINUTES OF THE ELEVENTH SITTING OF THE STANDING COMMITTEE ON ENERGY (2017-18) HELD ON 15th FEBRUARY, 2018, IN COMMITTEE ROOM 'G-074', PARLIAMENT LIBRARY BUILDING, NEW DELHI

The Committee met from 1430 hrs to 1645 hrs

PRESENT

LOK SABHA

Dr. Kambhampati Hari Babu - Chairperson

2. Shri Om Birla
3. Shri Harish Dwivedi
4. Shri Bhagat Singh Koshyari
5. Dr. Arun Kumar
6. Kunwar Sarvesh Kumar
7. Shri Jagdambika Pal
8. Shri Ravindra Kumar Pandey
9. Shri M.B. Rajesh
10. Gutha Sukender Reddy
11. Shri Bhanu Pratap Singh Verma
12. Shri Kotha Prabhakar Reddy
13. Shri Nagendra Kumar Pradhan

RAJYA SABHA

14. Shri T.K.S. Elangovan
15. Shri Oscar Fernandes
16. Shri Shamsher Singh Manhas
17. Shri S. Muthukaruppan
18. Shri Surendra Singh Nagar
19. Smt Viplove Thakur

SECRETARIAT

1. Shri A.K. Singh - Additional Secretary
2. Shri N.K. Pandey - Director
3. Smt. L. Nemjalhing Haokip - Under Secretary

Witnesses

MINISTRY OF NEW AND RENEWABLE ENERGY

1.	Shri Anand Kumar	Secretary
2.	Shri Praveen Kumar	Additional Secretary
3.	Shri B.P. Yadav	Joint Secretary
4.	Shri Anjani Nandan Sharan	Joint Secretary
5.	Shri Gopal Krishan Gupta	Joint Secretary
6.	Ms. Gargi Kaul	Joint Secretary & FA
7.	Ms. Sutapa Majumdar	Economic Advisor
8.	Shri Dilip Nigam	Scientist - G
9.	Dr. P.C. Maithani	Scientist - G
10.	Dr. B.S. Negi	Scientist - G
11.	Shri G.L. Meena	Scientist - G
12.	Shri Jatindra Nath Swain	MD (SECI)
13.	Shri K.S. Popli	CMD, IREDA

2. At the outset, the Hon'ble 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 2018-19'. Also, the 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 Additional Secretary, MNRE, made a power-point presentation on the subject "Examination of Demands for Grants of the Ministry of New and Renewable Energy for 2018-19" which, *inter-alia,* covered Renewable Energy Capacity Addition in the last decade, Position of India in the World in Renewable Sector, Share of RE Capacity in Total Installed Capacity, Comparative Expansion of Conventional *v/s* Renewal, Generation from various Renewable Energy Sources during the last three years, Financial Progress of the Ministry during the last three years, Budgetary Support over the years, Head Wise Allocation for the Schemes of the Ministry for 2017-18 and 2018-19, Financial and Physical Targets for 2018-19, Mission 175 GW by 2022, RPO Requirement and Achievement, Annual Addition to Solar Power Installed Capacity, State - wise Solar Power Installed Capacity, 2018-19 Solar Bidding Plan, Major Existing Schemes for Solar Sector, Solar Rooftop Programme - Issues, Solar Off-Grid Programme, Atal Jyoti Yojana (AJAY), New Solar Initiatives in Pipeline, Solar PV Manufacturing, Floating Solar, Annual Addition to Wind Power Installed Capacity, State - Wise Wind Power Installed

Capacity, Wind Bidding Trajectory, New Initiatives in Wind Sector, Off - Shore Wind, Wind - Solar Hybrid, Annual Addition to Small Hydro Installed Capacity, Challenges in SHP, Biomass Power, Green Energy Corridor, PSUs/Institutions of MNRE, etc.

4. The Secretary, Ministry of New and Renewable Energy, deposed before the Committee that the Ministry has a target to install a capacity of 175 GW through Renewable Sources by the year 2022. Out of this 175 GW, 100 GW has to come from Solar, 60 GW from Wind, 10 GW from Biomass and 5 GW from Small Hydro. As against the targets set, out of 100 GW of Solar Capacity, the Ministry had achieved 18.50 GW and it hoped to achieve 20 GW by 31st March, 2018. In wind sector, against the target of 60 GW, 32.80 GW had been achieved. In biomass, against the capacity of 10 GW, the Ministry had achieved 8.53 GW. In Small Hydro, the Ministry had achieved 4.40 GW against the total target of 5 GW. So, 62.50 GW capacity had already been installed and the Ministry sincerely hoped that by the end of 31st March, 2018, it would have an installed capacity of 68 GW. The Secretary also submitted that the prices of both Wind Energy and Solar Energy have come down to the affordable level and as far as the schemes of the Ministry are concerned, except for the roof top solar, all other schemes have been doing good.

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

(i) Achievements *vis-à-vis* targets under various programmes during 2017-18;

(ii) Financial requirement and allocation for 2018-19 *vis-à-vis* physical targets;

(iii) Performance and various issues relating to Solar, Wind, Small Hydro, Biomass etc;

(iv) Need to ensure proper implementation of RPO;

(v) Need for a separate Renewable Energy Policy;

(vi) Problem regarding availability of bi-directional Meter and proper implementation of Net - Metering;

(vii) Problem of ensuring timely payment from DISCOMs if the farmers sell their surplus power from Solar Agricultural Pumps to the DISCOMs;

(viii) Need to give boost to off - shore Wind and Floating Solar;

(ix) Need to ensure durability and quality of Solar Lights/Solar Pumps;

(x) Need for Research to increase the efficiency of Solar Cells;

(xi) Need to encourage domestic manufacturing of solar cells and modules in the country;

(xii) Need to resolve the issue regarding Custom Duty, Safeguard Duty/Anti Dumping Duty, GST etc. on Renewable Components.

(xiii) Need to consider large Hydro Projects (> 25 MW) as Renewable.

(xiv) Clarity in policies and regulations.

6. 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 then adjourned.

The verbatim proceedings of the sitting have been kept for record.

ANNEXURE - V

MINUTES OF THE FOURTEENTH SITTING OF THE STANDING COMMITTEE ON ENERGY (2017-18) HELD ON 9TH MARCH, 2018 IN COMMITTEE ROOM NO. 3, PARLIAMENT HOUSE ANNEXE EXT. BUILDING, NEW DELHI

The Committee met from 1000 hrs. to 1040 hrs.

PRESENT

LOK SABHA

Dr. Kambhampati Haribabu- Chairperson

2. Shri Bhagat Singh Koshyari
3. Shri Malyadri Sriram
4. Shri M.B. Rajesh
5. Shri Vinayak Bhaurao Raut
6. Shri Bhanu Pratap Singh Verma
7. Shri Nagendra Kumar Pradhan

RAJYA SABHA

8. Shri T.K.S. Elangovan
9. Shri Oscar Fernandes
10. Shri Shamsher Singh Manhas
11. Shri S. Muthukaruppan

SECRETARIAT

1. 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 the following draft Reports for consideration and adoption:-

1) Draft Report on Demands for Grants of the Ministry of Power for the year 2018-19.
2) Draft Report on Demands for Grants of the Ministry of New and Renewable Energy for the year 2018-19.

3. After discussing the contents of the Reports in detail, the Committee adopted the aforementioned draft Reports without any amendment. The Committee also authorized the Chairperson to finalize the above-mentioned Reports and present the same to both the Houses of Parliament in the Budget Session.

4. X X X X X X X X X X X X

The Committee then adjourned.