

GOVERNMENT OF INDIA
MINISTRY OF NEW AND RENEWABLE ENERGY
LOK SABHA
UNSTARRED QUESTION NO. 1516
TO BE ANSWERED ON 24.11.2016

ENHANCEMENT IN GREEN ENERGY CAPACITY

1516. SHRI SANJAY DHOTRE:

SHRI BHARTRUHARI MAHTAB:

SHRI RAHUL SHEWALE:

Will the Minister of NEW AND RENEWABLE ENERGY be pleased to state:

- (a) whether the Government has enhanced its green energy capacity across the country during each of the last three years and the current year;
- (b) if so, the details thereof, State/UT-wise;
- (c) the extent to which the Government has achieved its goal to add 1 lakh MW solar energy capacity in the country;
- (d) the funds sanctioned, released and utilized for Research & Development efforts for new technologies and improvement in efficiency of solar panels across the country during the said period, State/UT-wise;
- (e) the number of Public and Private Sector Companies which have given Green Energy Commitment Certificates so far for power generation capacity in the country; and
- (f) the other steps taken/being taken by the Government to encourage investors/ companies to tap the potential of green energy in the country along with the achievements thereon?

ANSWER

THE MINISTER OF STATE FOR POWER, COAL, NEW AND RENEWABLE ENERGY & MINES
(INDEPENDENT CHARGE) (SHRI PIYUSH GOYAL)

(a) & (b): The details of capacity addition under Grid Interactive Renewable power from various renewable energy sources in the country during the last three years and current year are as follows:

Year	Capacity addition (in MW)
2013-14	3640
2014-15	4102
2015-16	7060
2016-17 (upto 31-10-2016)	3568

State / UT wise details are given in **Annexure-I**.

- (c): A total capacity of 8728 MW of Solar projects have been installed in the country so far.
- (d): Central financial assistance of Rs 541.55 crore has been released to various organizations/ universities / institutions for taking up Research and Development (R&D) activities in various new and renewable energy technologies including solar energy during last three and half years. The details of organizations funded for R&D activities in the field solar energy is given in Annexure-II.
- (e): MNRE has organized 1st Global Renewable Energy Investors Promotion Meet (RE-INVEST 2015) during February 15-17, 2015 in New Delhi. As part of RE-INVEST 2015 initiative, 464 companies/firms (both private and public sectors) have submitted Green Energy Commitment (GEC) Certificates, aggregating to 292 GW power generation capacity during the next five years.
- (f): To encourage the investment in renewable energy sector, Government provides incentives in the forms of generation based incentives/subsidies, viability gap funding from NCEF, fiscal incentives such as accelerated depreciation, concessional customs duty, excise duty exemptions, income tax holiday for 10 years and preferential tariff for renewable energy power projects. Besides, MNRE organized a Global Renewable Energy Investment Promotion Meet (REINVEST) in February, 2015 to showcase the potential and policy options available in the RE sector wherein commitment from power producers, manufacturers and financial institutions were received for investments in the solar.

State-wise & Year-wise details of Installed Capacity Addition under Grid Interactive Power during the last 3 years and Current Year-- referred to in parts (a) of the question No. 1516 for 24/11/2016.

S.No.	State/UT	Total Installed Capacity (in MW)			
		2013-14	2014-15	2015-16	2016-17 (as on 31.10.2016)
1	Andhra Pradesh	409.18	414.17	844.964	965.38
2	Arunachal Pradesh	0	0.7	0.24	0
3	Assam	3	0	0	10
4	Bihar	0	0	5.1	90
5	Chhattisgarh	18.1	15.5	85.98	58.98
6	Goa	0	0	0	0
7	Gujarat	351.7	287.78	511.523	340.26
8	Haryana	2.5	3.9	4.587	2
9	Himachal Pradesh	51	85.01	69.601	5.5
10	Jammu & Kashmir	17	9	1	0
11	Jharkhand	0	0	0.186	0.65
12	Karnataka	379.9	575.32	545.142	442.92
13	Kerala	0	10.5	51.42	6.1
14	Madhya Pradesh	357.25	670.3	1479.19	182.51
15	Maharashtra	1436.25	624.68	333.686	41.85
16	Manipur	0	0	0	0
17	Meghalaya	0	0	0	0
18	Mizoram	0	0	0.1	5
19	Nagaland	1	0	1	0
20	Orissa	17.83	2.26	35.16	0
21	Punjab	25.22	184.95	233.293	166.14
22	Rajasthan	285.75	759.35	1013.332	165.63
23	Sikkim	0	0	0	0
24	Tamil Nadu	221.74	271.22	1117.04	565.54
25	Telangana	0	61.25	438.495	456.95
26	Tripura	0	5	0	0
27	Uttar Pradesh	3.7	42.16	165.735	6
28	Uttarakhand	20	67.5	49.145	0
29	West Bengal	5	0.1	0.562	4
30	Andaman & Nicobar	0	0	0	0
31	Chandigarh	2	0	2.306	0
32	Dadra & Nagar Haveli	0	0	0	0
33	Daman & Diu	0	0	4	0
34	Delhi	2.14	0.32	8.815	9.59
35	Lakshwadeep	0	0	0	0
36	Pondicherry	0	0	0	0
37	Others	20	16.5	58.311	42.61
	Total	3640.76	4102.96	7060.413	3567.61
MW = Mega Watt					

Annexure-II

Annexure-II referred to in reply to part (d) of Lok Sabha Unstarred Question No. 1516 for 24-11-2016 regarding 'Enhancement in Green Energy Capacity'

List of On Going R&D Projects in in the field of Solar Energy

Sl. No.	Project Title	Name of PI & Organization
Solar Thermal Projects		
1.	1 MWel. (3.5 MW) solar thermal power plant with 16 hours thermal storage for continuous operation	WRST,Mumbai
2.	To set up Centre of Excellence in area of solar passive architecture and green building technologies” by CEPT University, Ahmadabad	CEPT University, Navrangpura, Ahmedabad
3.	Establishment of the Centre of Excellence in solar thermal research and education at IIT Jodhpur, Rajasthan	IIT Jodhpur, Rajasthan
4.	Setting up facility for calibration of solar radiation measuring sensors and its analysis/ modelling based on ground surface measurements	Solar Energy Corporation of India, New Delhi
5.	30 kW cross liner-CSP system Test Unit	Rajiv Gandhi Proudtyogiki Vishwavidyalaya, University Institute of Technology, (RGPV) Bhopal.
6.	Design, Construction and Demonstration of zero energy building for Solar Decathlon Europe 2014	, Department of Energy Science and Engineering, IIT Bombay
7.	“High Energy Density Thermal Energy Storage for Concentrated Solar Plant”	Ram Krishna Dharmarth Foundation University, (RKDF) Bhopal.
8.	“Development of a monitoring system for the energy reception elements in Solar Thermal plants” by under Indo-Spanish Joint Programme for Technological co-operation in Renewable Energy	The Energy and Resources Institute (TERI), IHC Complex, Lodi Road, New Delhi.
9.	“Design Development and Proto building a Solar Energy Driven desiccant & Ejector based Environmental friendly Air Conditioning System”	MAEERS’s Maharastra Institute of Technology, Kothurd, Pune
10.	“Development of fully automatic double axis tracking of Scheffler Dish System for enhanced performance”	Malviya National Institute of Technology, Bhopal
11.	Studies on utilization of Solar Energy in Tasar Post Cocoon Technology Operations	Central Tasar Research & Training Institute, Ranchi
12.	Development of high efficiency receiver for supercritical CO2 integrated with static focus parabolic dish	IISc Bangalore and World Renewal Spiritual Trust (WRST), Bombay
Solar Photovoltaic		
13.	R&D on thin film solar cell	NPL-CSIR, New Delhi

14.	Dye Sensitized Solar Cell (DSSC)/Quantum dot Dye Sensitized Solar Cell	CSIR-IICT, Hyderabad
15.	Advanced research on thin silicon solar cells and photovoltaic systems	Bengal Engineering & Science University, West Bengal
16.	Development of novel, efficient and cost effective power electronics based single phase system to convert Solar Energy from solar PV to Electric Energy.	Jamia Milia Islamia university, New Delhi
17.	Design and development of an efficient soft-switching converter with adaptive maximum power point tracking (MPPT) controller for a standalone photovoltaic power generation system.	Birla Institution of Technology and Science Pilani, Rajasthan
18.	Design, development and field evaluation of smart control system for domestic roof top PV applications with metering.	Electrical Research and Development Association, ERDA, Gujarat
19.	Design and Development of a cost-effective and highly efficient Solar-Powered Electric Vehicle (SEV) prototype	Netaji Subhas Institute of Technology Azad Hind FaujMarg, , New Delhi
20.	Development of improved DS process for mc-Si wafers and their application to Solar Cells	SSN College of Engineering, Kalavakkam, Tamil Nadu
21.	Development of High Efficiency selective large area N-Type crystalline silicon solar cell.	Megnad Saha Institute of Technology, Nazirabad Kolkata.
22.	“Determination of Wind Forces on Solar Photovoltaic Panels Mounted on Different Types of Roof and on/above Ground in India Using Computational Fluid Dynamics Techniques”	Aligarh Muslim University, Aligarh.
23.	Facilitating the target of 100GW Solar by 2022: An Inclusive Analysis towards achievement”	National Institute of Advanced Studies, Indian Institute of Science, Bangalore
24.	National Centre for Photovoltaic Research and Education (NCPRE) Phase-II	IIT Mumbai
25.	“Development and field testing of Solar powered clean drinking water systems for communities without piped water line and electricity”	National Institute of Solar Energy and M/s SauryaEneritech, Gurugram
26.	Development of Electrode Materials for High Energy Density Lithium ion Batteries and Computational Studies of Solar Absorber layers	SRM Research Institute, SRM University, Kattankulathur, Tamil Nadu.
27.	From Cell towards Module using low cost Organo-Metal Halide Perovskite Materials	Indian Institute of Technology Bombay, Powai, Mumbai.