

GOVERNMENT OF INDIA
MINISTRY OF NEW AND RENEWABLE ENERGY
LOK SABHA
UNSTARRED QUESTION NO-3816
ANSWERED ON-18.03.2021

ENERGY REQUIREMENTS PER PERSON

3816. DR. SHRIKANT EKNATH SHINDE

DR. SUJAY RADHAKRISHNA VIKHE PATIL

SHRI DHAIRYASHEEL SAMBHAJIRAO MANE

SHRI UNMESH BHAIYYASAHEB PATIL

DR. HEENA GAVIT

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

- (a) whether the Government has an estimate of the energy requirements per person in the country for the coming decade and if so, the details thereof;
- (b) whether proposals are undertaken for research and innovation in renewable and green energy such as solar, wind, and thermal power and if so, the details thereof;
- (c) whether there are estimates on India's capacity to generate renewable energy, State-wise; and
- (d) whether the current estimates will enable India to reduce its energy import dependency in the upcoming decade and if so, the details thereof?

ANSWER

THE MINISTER OF STATE (I/C) FOR NEW & RENEWABLE ENERGY, POWER and MoS for SKILL DEVELOPMENT AND ENTREPRENEURSHIP

(SHRI R.K. SINGH)

- (a) As per 19th Electric Power Survey (EPS) prepared by Central Electricity Authority (CEA), the electrical energy requirement of the Country for the year 2031-32 has been projected at 25,30,531 Million Units(MUs).
- (b) Under the R&D scheme of the Ministry of New and Renewable Energy, proposals for research and innovation are invited from R&D institutes/ Universities/IITs/NITs/ Industry in the R&D thrust area identified by the Ministry. The details of ongoing R&D Projects being supported by the Ministry are given at **Annexure-I**.
- (c) The state-wise, resource-wise details of estimated renewable energy potential (excluding large hydro potential) in the country are given at **Annexure-II**.
- (d) At present, the Country is self sufficient to meet its electricity requirements. However, as part of its Nationally Determined Contributions at the Paris Accord on Climate Change, India has undertaken to achieve at least forty percent of its total electricity generation capacity from non-fossil fuels by 2030.

**Annexure referred to in reply to part (b) of Lok Sabha Unstarred Question No.3816 for 18/03/2021
regarding 'Energy Requirements per Person'
"List of R&D Projects undertaken by Ministry"**

Solar PV

Sl. No.	Name of the Project	Implementing Agency
1.	National Centre for Photovoltaic Research and Education (NCPRE) Phase-II	Indian Institute of Technology Mumbai
2.	"Process development for fabrication CZTS based solar cell on flexible (Polyimide) substrate"	KIIT University Bhubaneswar.
3.	"National Primary Standard facility for cell calibration"	National Physical Laboratory (NPL), Delhi
4.	"Development of high efficiency (21%/ 19%) PERC type of c-Si/mc-Si solar cells"	BHEL and National Institute of Solar Energy, Gurugram
5.	Porphyrin@Graphene Quantum Dots sensitized solar cells (PGSSCs) using polypyrrole-graphene composites as counter electrode- A step towards 4G solar cells	Guru Govind Singh Indraprastha University, Dwarka
6.	Flexible Perovskite Solar Cells and Intermediate Module	Indian Institute of Technology Bombay, Powai, Mumbai
7.	Design and Development of 'High Efficiency Solar Water Pumping Systems	National Institute of Solar Energy (NISE)

Solar Thermal

Sl. No.	Name of the Project	Implementing Agency
8	Setting up facility for calibration of solar radiation measuring sensors and its analysis/ modelling based on ground surface measurements	NISE Gurugram
9	Development of high efficiency receiver for supercritical CO2 integrated with static focus parabolic dish	IISc Bangalore and World Renewable Spiritual Trust (WRST), Bombay
10	Design, Development of Supercritical CO2 Turbomachinery for Solar Thermal Power Plants	Indian Institute of Science, Bangalore.
11	System Design, Erection, Testing & Commissioning of 40 kWth and 10 kWe pilot plant aiming at the Feasibility Study of MWe Scale Concentrated Solar Thermal Plant integrated with 24 x 7 Thermal Energy Storage	Ram Krishna Dharmarth Foundation University, Bhopal and RPI USA
12	Design, development and demonstration of solar dryer suitable for drying natural rubber sheets in North East India	Central Salt & Marine Chemicals research Institute, CSIR-Bhavnagar, Gujarat

Hydrogen and Fuel Cell

Sl.No	Name of the Project	Implementing Agency
13	Hydrogen generation using biomass gasification for fuel cell application (HBGF)	IISc Bangalore
14	Development of design methodology for light weight high pressure hydrogen storage composite cylinder for vehicular applications	CMERI, Durgapur
15	Hierarchical composite nano-structure photo-catalysts for efficient water splitting under solar light irradiation	Yogi Vemana University & CECRI, Karaikudi
16	Design & development of 20kW Low Temperature Polymer Electrolyte Membrane Fuel Cell (LTPEMFC) with high indigenous content	ARCI-CFCT, Chennai
17	Setting Up of a Centre of Excellence on Hydrogen Energy at National Institute of Solar Energy (NISE), Gwal Pahari, Haryana	NISE, Gurgaon
18	Studies on novel semiconductors towards increasing the efficiency of Photo-electro-chemical (PEC) water splitting for hydrogen generation	Dayalabagh Educational Institute, Agra

Wind Energy

S. no.	Name of project	Implementing Agency
19	Integrated Wind and Solar resource Assessment	National Institute of Wind Energy Chennai
20	Met-Ocean Measurements (Wind, Wave, Tide, Current, Water Level, etc.,) at Gulf of Khambhat and Gulf of Mannar	National Institute of Wind Energy Chennai

Bio Energy

S. no.	Name of project	Implementing Agency
21	Bio gas from Paddy straw	IIT Delhi

**Annexure referred to in reply to part (c) of Lok Sabha Unstarred Question No.3816 for 18/03/2021
regarding 'Energy Requirements per Person'
“Source and State-wise details of estimated potential of Renewable Energy in MW”**

Sl. No.	STATES / Uts	Wind Power	Small Hydro Power	Bio-Energy			Solar	Total
				Biomass Power	Bagasse Cogeneration	Waste To Energy		
		(MW) @ 100m	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)
1	Andhra Pradesh	44229	409.32	578	300	123	38440	84079
2	Arunachal Pradesh		2064.92	8			8650	10723
3	Assam		201.99	212		8	13760	14182
4	Bihar		526.98	619	300	73	11200	12719
5	Chhattisgarh	77	1098.20	236		24	18270	19705
6	Goa	1	4.70	26			880	911
7	Gujarat	84431	201.97	1221	350	112	35770	122086
8	Haryana		107.40	1333	350	24	4560	6374
9	Himachal Pradesh		3460.34	142		2	33840	37444
10	Jammu & Kashmir (including Ladakh)		1707.45	43			111050	112800
11	Jharkhand		227.96	90		10	18180	18508
12	Karnataka	55857	3726.49	1131	450		24700	85864
13	Kerala	1700	647.15	1044		36	6110	9538
14	Madhya Pradesh	10484	820.44	1364		78	61660	74406
15	Maharashtra	45394	786.46	1887	1250	287	64320	113925
16	Manipur		99.95	13		2	10630	10745
17	Meghalaya		230.05	11		2	5860	6103
18	Mizoram		168.90	1		2	9090	9261
19	Nagaland		182.18	10			7290	7482
20	Orissa	3093	286.22	246		22	25780	29428
21	Punjab		578.28	3172	300	45	2810	6905
22	Rajasthan	18770	51.67	1039		62	142310	162233
23	Sikkim		266.64	2			4940	5209
24	Tamil Nadu	33800	604.46	1070	450	151	17670	53745
25	Telangana	4244	102.25				20410	24756
26	Tripura		46.86	3		2	2080	2131
27	Uttar Pradesh		460.75	1617	1250	176	22830	26333
28	Uttarakhand		1664.31	24		5	16800	18493
29	West Bengal	2	392.06	396		148	6260	7198
30	Andaman & Nicobar	8	7.27				0	15
31	Chandigarh					6	0	6
32	Delhi					131	2050	2181
33	Lakshwadeep	8					0	8
34	Pondicherry	153				3	0	156
35	Others					1022	790	1812
	Total	302251	21133.62	17536	5000	2554	748990	1097465