

GOVERNMENT OF INDIA
MINISTRY OF NEW AND RENEWABLE ENERGY
LOK SABHA
UNSTARRED QUESTION NO-781
ANSWERED ON-17/09/2020

ENERGY REQUIREMENTS PER PERSON

+781. SHRI HEMANT SRIRAM PATIL
SHRI DHAIRYASHEEL SAMBHAJIRAO MANE
SHRI UNMESH BHAIYYASAHEB PATIL
DR. SUJAY RADHAKRISHNA VIKHE PATIL
DR. SRIKANT EKNATH SHINDE

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 the field of 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 and if so, the details thereof, State-wise; and
- (d) whether the current estimates will enable India to reduce its energy import dependency and move towards renewable energy 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) conducted by 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 Ministry's R&D scheme, proposals for assistance 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 assisted by the Ministry are given at **Annexure-I**.
- (c) The details of estimated renewable energy potential identified for various renewable energy sources in the country are given at **Annexure-II**.
- (d) At present, the Country is self sufficient to meet its electricity requirements. However, as a part of Intended Nationally Determined Contributions at the Paris Accord on Climate Change, India has undertaken to install at least forty percent of its total electricity generation capacity from non-fossil fuel sources by 2030.

**Annexure referred to in reply to part (b) of Lok Sabha Unstarred Question No.781 for
17/9/2020 regarding 'Energy Requirements per Person'**

"List of R&D Projects undertaken by Ministry"

Solar		
Solar Photovoltaic		
Sl. No.	Name of the Project	Implementing Agency
1.	National Centre for Photovoltaic Research and Education (NCPRE) Phase-II	Prof. B G Fernandes and Prof C S Solanki, Indian Institute of Technology Mumbai
2.	"Process development for fabrication CZTS based solar cell on flexible (Polyimide) substrate"	Dr. Udai. P Singh. KIIT University Bhubaneswar.
3.	"National Primary Standard facility for cell calibration"	Dr .Vandana National Physical Laboratory (NPL), Delhi
4.	"Development of high efficiency (21%/19%) PERC type of c-Si/mc-Si solar cells"	Dr. A. K. Saxena, Additional General Manger & Head, BHEL-ASSCP, Gurugram and Dr. Arun K. Tripathi, 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	Dr. A. K Narula, Guru Govind Singh Indraprastha University, Dwarka
6.	Flexible Perovskite Solar Cells and Intermediate Module	Prof. Shaibal K. Sarkar, Indian Institute of Technology Bombay, Powai, Mumbai
7.	Design and Development of 'High Efficiency Solar Water Pumping Systems	Director General, National Institute of Solar Energy (NISE)
Solar Thermal		
8.	Setting up facility for calibration of solar radiation measuring sensors and its analysis/ modelling based on ground surface measurements	Director General (DG) NISE Gurugram
9.	Development of high efficiency receiver for supercritical CO2 integrated with static focus parabolic dish	Prof. Pradip Dutta, IISc Bangalore and Dr. B K Jaysimha, World Renewal Spiritual Trust (WRST), Bombay
10.	Design, Development of Supercritical CO ₂ Turbomachinery for Solar Thermal Power Plants	Dr.-Ing Punit Singh, Assistant Professor, 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	Dr. V K Sethi, 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	Dr. Mrs. Subarna Maiti, Senior Scientist, CSIR- Central Salt & Marine Chemicals research Institute, Bhavnagar Gujarat
Hydrogen and Fuel Cell		

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		
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		
21.	Bio gas from Paddy straw	IIT Delhi

**Annexure referred to in reply to part (c) of Lok Sabha Unstarred Question No.781 for
17/9/2020 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	Chhatisgarh	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	Dadar & Nagar Haveli						0	0
33	Daman & Diu						0	0
34	Delhi					131	2050	2181
35	Lakshwadeep	8					0	8
36	Pondicherry	153				3	0	156
37	Others					1022	790	1812
	Total	302251	21133.62	17536	5000	2554	748990	1097465