

**GOVERNMENT OF INDIA
NON-CONVENTIONAL ENERGY SOURCES
LOK SABHA**

STARRED QUESTION NO:407
ANSWERED ON:18.12.2000
ASSESSMENT OF RENEWABLE ENERGY
MADHAVRAO SCINDIA;SUSHIL KUMAR SAMBHAJIRAO SHINDE

Will the Minister of NON-CONVENTIONAL ENERGY SOURCES be pleased to state:

- (a) whether there is immense renewable energy resource potential in the country particularly in Assam and other North-Eastern States to meet the requirements of unelectrified remote and unconnected villages in the region;
- (b) if so, the details thereof, State-wise;
- (c) whether the Indian Renewable Energy Development Agency has assessed the potential of renewable energy in each State;
- (d) if so, the details thereof, State-wise;
- (e) the details of the project, if any, drawn out for the purpose, State-wise; and
- (f) the further steps taken to implement the same?

Answer

MINISTER OF STATE FOR NON-CONVENTIONAL ENERGY SOURCES (INDEPENDENT CHARGE) (SHRI M. KANNAPPAN)

(a), (b), (c) (d),(e)& (f) : A Statement is laid on the Table of the House.

Statement referred to in reply to parts (a), (b), (c), (d), (e) & (f) of Lok Sabha

Starred Question No. 407 to be answered on 18.12.2000 regarding assessment of renewable energy.

(a), (b), (c) & (d): Yes, Sir. India has a vast potential of renewable energy resources such as solar, wind, small hydro power, biomass, urban and industrial wastes, biogas etc. which can be utilised to meet the energy requirements for cooking, heating, lighting and electricity etc. of un-electrified remote and unconnected villages of the country including Assam and other North-Eastern States in a decentralized manner. The broad estimated potential of major renewable energy resources in the country is given in Annexure-I. Indian Renewable Energy Development Agency has separately not assessed the State-wise potential of renewable energy resources. The assessment of potential (including the States of Assam and the North-East) State-wise, has been made by the Ministry for biogas, improved chulhas, bagasse based cogeneration, wind power and small hydro power for which details are given in Annexure-II.

(e) & (f): The Ministry is implementing a wide range of schemes/programmes to harness these renewable energy resources by providing various fiscal, financial and promotional incentives i.e. central subsidy, 100% accelerated depreciation, concessional custom duty, excise duty/sales tax exemption, soft term loans, conducive policies for wheeling, banking, buy-back, third party sale of renewable energy power etc. In addition, higher subsidies/incentives are provided under major programmes in areas such as the North-East States including Sikkim, Hill areas, Islands, etc. The details of State-wise projects/systems installed under various renewable energy programmes/schemes are given in Annexure-III.

Annexure-I

Annexure-I referred to in reply to parts (a), (b), (c) and (d) of Starred Question No.407 for 18-12-2000 regarding Assessment of Renewable Energy.

Details of estimated potential of major Renewable Energy Resources in the country.

Resources/Systems	Estimated Potential
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1. Biogas plants (No.)	120 lakh
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2. Improved Chulha (No.) 12 crores
3. Biomass
 a. Biomass Power 16,000 MW
 b. Bagasse based Cogeneration 3,500 MW
4. Solar Photovoltaic Power 20 MW/sq. km.
5. Solar Thermal Power 35 MW/sq.km.
 Solar Water Heating Systems 30 million square meter collector area

6. Wind Power 45,000 MW

7. Small Hydro Power 15,000 MW

8. Energy Recovery from wastes 1700 MW

MW = Mega-watt Sq. km.= Square Kilometer

STATE-WISE POTENTIAL ESTIMATES FOR MAJOR RENEWABLE ENERGY RESOURCES

FAMILY TYPE IMPROVED CHULHAS SMALL HYDRO BAGASSE BASED WIND
 BIOGAS PLANTS POWER (upto 15 MW) COGENERATION + POWER
 (Nos. in lakh) (Nos. in lakh) (MW) (MW) (MW)

Andhra Pradesh	10.66	97.08	211	200	8275
Arunachal Pra.	0.08	1.5	843		
Assam	3.08	36	118		
Bihar	9.40	123.83	253	200	
Goa	0.08	1.17	3		
Gujarat	5.54	50.72	157	200	9675
Haryana	3.00	20.61	30		
Himachal Pra.	1.26	8.53	1476		
Jammu & Kashmir	1.29	11.75	874		
Karnataka	6.80	60.76	551	300	6620
Kerala	1.51	40.73	403	875	
Madhya Pradesh	14.91	101.58	263	5500	
Maharastra	8.97	96.5	431	1000	3650
Manipur	0.39	2.64	90		
Meghalaya	0.24	2.54	139		
Mizoram	0.02	0.73	143		
Nagaland	0.07	2.01	144		
Orissa	6.06	54.55	157	1700	
Punjab	4.12	25.38	65	150	
Rajasthan	9.15	55.54	27	5400	
Sikkim	0.07	0.73	203		
Tamil Nadu	6.16	80.16	232	350	3050
Tripura	0.29	4.65	10		
Uttar Pradesh	20.21	187.45	1366	1000	
West Bengal	6.95	98.72	183	450	
Andaman&Nicobar	0.02	0.4	1		
Chandigarh	0.14	0.66			
Dadar & Nagar Haveli	0.02	0.25			
Daman & Diu	-	0.1			
Delhi	0.13	9.06			
Lakshwadeep	-	0.1			
Pondicherry	0.04	0.59			

MW = Mega Watt.

Annexure-III referred to in reply to parts (e) & (f) of Lok Sabha Starred Question No.407 for 18-12-2000 regarding Assessment of Renewable Energy.

State-wise Details of the installations made under major Non-Conventional Energy Programmes as on 31.3.2000.

STATES/UT	BIOGAS PLANTS (Nos.)	IMPROVED CHULHA (Nos.in lakh)	SHP POWER (MW)	WIND POWER (MW)	BIOMASS SLS (MW)	HLS (Nos.)	SL (Nos.)	PP (Nos.)	Cooker (Nos.)	Gasifiers (Nos.)	SOLAR PHOTOVOLTAIC (kWp)	Solar (Nos.)	Biomass (kW)	U&I (MW)
Andhra Pradesh	273019	34.67	34	88	12	3217	1150	14401	20.6	11778	13634	7.7		
Arunachal Pra.	631	0.33	21	0	0	738	650	4437	7.9	530	180	0		
Assam	35816	5.31	2	0	0	98	1666	475	3	80	23	0		
Bihar	111422	11.42	0	0	0	673	456	41949	0	730	20	0		
Goa	3145	1.17	0	0	0	31	31	51	1.72	1417	22	0		
Gujarat	331642	13.29	2	167	0.5	1584	840	14808	14	47908	3921	2		
Haryana	39373	9.87	0	0	4	1030	2939	20922	24.2	17752	964	0		
Himachal Pra	42119	6.6	12	0	0	844	6843	17248	0	25616	7	0		
Jammu & Kashmir	1759	4.14	8	0	0	389	10169	5225	0	345	120	0		
Karnataka	263621	14.56	25	34	37	516	28	898	3	250	3699	1		
Kerala	57231	8.67	6	2	0	675	2498	31386	4.7	194	615	0		
Madhya Pra.	169780	29.01	6	23	5	5554	149	7601	22.6	181000	4429	2.7		
Maharashtra	641143	22.92	7	79	9	3045	226	5268	5.6	52017	3323	0		
Manipur	1756	0.65	4	0	0	370	50	3400	11	365	0	0		
Meghalaya	989	0.18	2	0	0	593	320	3200	31.5	1164	0	0		
Mizoram	2066	0.47	12	0	0	315	1645	3539	0	118	0	0		
Nagaland	1032	0.26	4	0	0	271	8	0	6	0	0	0		
Orissa	156738	17.63	1	1	0	5482	1064	5105	33.5	2981	72	0		
Punjab	55683	11.07	10	0	10	955	2200	10265	41	17219	660	0.75		
Rajasthan	65457	25.45	5	2	0	6685	15647	4624	0	36016	218	0		
Sikkim	2445	0.68	9	0	0	127	160	320	0	20	0	0		
Tamil Nadu	196413	26.11	7	771	94	2071	21	5203	25	1355	853	0.06		
Tripura	1015	0.53	1	0	0	340	1478	6895	24.6	68	0	0		
Uttar Pradesh	331339	37.04	31	0	50.5	708	57105	56288	178.9	39873	511	1		
West Bengal	160726	29.6	8	0	0	1264	8942	3271	190.9	5575	530	0		

STATES/UT	BIOGAS PLANTS (Nos.)	IMPROVED CHULHA (Nos.in lakh)	SHP POWER (MW)	WIND POWER (MW)	BIOMASS SLS (MW)	HLS (Nos.)	SL (Nos.)	PP (Nos.)	Cooker (Nos.)	Gasifiers (Nos.)	SOLAR PHOTOVOLTAIC (kWp)	Solar (Nos.)	Biomass (kW)	U&I (MW)
Andaman & Nicobar	137	0.31	0	0	0	334	390	434	149.1	59	167	0		
Chandigarh	97	0.19	0	0	0	100	775	0	1523	0	0	0		
Dadar & Nagar Haveli	168	0.13	0	0	0	0	0	0	0	81	0	0		
Daman & Diu	0	0.01	0	0	0	0	0	0	0	0	0	0		
Delhi	671	2.66	0	0	0	301	0	4753	5	27990	74	0		
Lakshwadeep	0	0.05	0	0	0	704	0	5060	85	0	0	0		
Pondicherry	539	0.36	0	0	0	2	0	531	0	88	0	0		
Others	0	4.37	0	0	0	0	0	7000	318	0	0	0		

Total 2947972 319.71 217 1167 222 38916 116775 278332 888.82 481112 34360 15.21

HLS = Home Lighting System, SL= Solar Lanterns
 MW = Mega Watt, kW= Kilo Watt,
 PP = Power Plants
 kWp = kilowatt peak