

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

STARRED QUESTION NO:171
ANSWERED ON:31.07.2003
DEVELOPMENT OF ENERGY FROM NCES
ANANTRAO GUDHE;HARIBHAU MAHALE

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

- (a) whether there is an ample scope for development of energy from Non-conventional Energy Sources in various States;
- (b) if so, whether any efforts have been made to explore the possibilities in this regard and extent to which these sources have been exploited so far in these States, State-wise;
- (c) if so, the details thereof and amount allotted to States as an aid to expand NCES; and
- (d) if not, the reasons therefor?

Answer

MINISTER OF STATE OF THE MINISTRY OF NON-CONVENTIONAL ENERGY SOURCES (SHRI M. KANNAPPAN)

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

Statement referred to in reply to parts (a), (b), (c) and (d) of Lok Sabha Starred Question No. 171 for answer on 31.07.2003 regarding Development of Energy from NCES

(a): A potential of over 80,000 MW power generation from non-conventional energy sources has been estimated. In addition, there is scope for installing decentralized systems, i.e., biogas plants, solar photovoltaic systems, solar water heaters, etc.

(b),(c)&(d): The Government is implementing a wide range of programmes for exploiting the non-conventional energy potential in the country. The details of estimated potential and achievements under the major programmes as on 31-3-2003 are given in Annexure-I. The State-wise estimated potential for major programmes is given in Annexure-II and the State-wise achievements in Annexure III. The details of State-wise cumulative funds released under the various non-conventional energy programmes commencing from the 7th plan, i.e., 1985-86 up to 2002-03 are given in Annexure-IV.

Annexure-I

Annexure I referred to in reply to parts (b), (c) & (d) of Lok Sabha starred Question No. 172 for answer on 31-7-2003 regarding Development of energy from NCES

Estimated Potential and Achievements under Major Programmes as on 31.3.2003

S. No.	Source/System	Estimated Potential	Achievements
A. Power from Renewables			
1.	Solar Photovoltaic Power	20 MW/sq. km.	2.49 MW
2.	Wind Power	45195 MW	1869.50 MW
3.	Small Hydro Power (up to 25 MW)	15,000 MW	1509.26 MW
4.	Biomass/Bagasse Cogeneration Power	19,500 MW #	483.93 MW
5.	Biomass Gasifier	53.37 MW	
6.	Energy from Wastes	2,700 MW	25.75 MW
	Power from Renewable (Total)	82,395 MW	3944.30 MW

B. Decentralized Energy System

7. Family-size Biogas plant 120 lakh 35.24 lakh
8. Solar Photovoltaic System - 107 MW
9. Solar Water Heating System 40 million sq. m. 0.70 million sq. m
 collector area collector area
- Sq. km. = Square Kilometer
 Sq. m. = Square meter
 MW = Mega-watt
 # = including Biomass Gasifier

Annexure-II

State-wise Estimated Potential for major Non-conventional energy sources

Sl. States/UTs Wind SHP### Bagasse Energy Biogas# Improved#
 No. Power Cogen from Plants Chulha
 (MW) (MW) (MW) MSW(MW) (Nos. (Nos. in lakh)
 in lakh)

1	Andhra Pradesh	8275	254.63	200	123	10.66	97.08
2	Arunachal Pradesh	0	1059.03	0	0	0.08	1.50
3	Assam	0	118.00	0	8	3.08	36.00
4	Bihar	0	194.02	200	62	9.40	133.93
5	Chhattisgarh	0	57.90	0	20		
6	Goa	0	2.60	0	0	0.08	1.40
7	Gujarat	9675	156.83	200	112	5.54	50.72
8	Haryana	0	30.05	0	23	3.00	20.90
9	Himachal Pradesh	0	1624.78	0	1	1.26	8.53
10	Jharkhand	0	170.05	0	10		
11	Jammu & Kashmir	0	1207.27	0	0	1.29	11.75
12	Karnataka	6620	652.61	300	151	6.80	60.76
13	Kerala	875	466.85	0	37	1.51	40.73
14	Madhya Pradesh	5500	336.32	0	92	14.91	101.58
15	Maharashtra	3650	599.47	1000	287	8.97	96.50
16	Manipur	0	105.63	0	2	0.39	2.64
17	Meghalaya	0	181.50	0	2	0.24	2.54
18	Mizoram	0	190.32	0	2	0.03	0.73
19	Nagaland	0	181.39	0	0	0.07	2.01
20	Orissa	1700	156.76	0	22	6.05	54.55
21	Punjab	0	65.26	150	45	4.12	26.29
22	Rajasthan	5400	27.26	0	62	9.15	56.10
23	Sikkim	0	202.75	0	0	0.07	0.92
24	Tamil Nadu	3050	338.92	350	151	6.16	80.16
25	Tripura	0	9.85	0	2	0.29	4.65
26	Uttar Pradesh	0	267.06	1000	176	20.21	198.10
27	Uttaranchal	0	1478.24	0	5		
28	West Bengal	450	182.62	0	147	6.95	98.72
29	Andaman & Nicobar	0	6.40	0	0	0.02	0.40
30	Chandigarh	0	0.00	0	6	0.14	0.66
31	Dadar & Nagar Haveli	0	0.00	0	0	0.02	0.25
32	Daman & Diu	0	0.00	0	0	0.00	0.10
33	Delhi	0	0.00	0	131	0.13	9.06
34	Lakshwadeep	0	0.00	0	0	0.00	0.10
35	Pondicherry	0	0.00	0	3	0.04	0.59
36	Common for all States##			100	1020		
Total		45195	10324.37	3500	2700	120.63	1199.95

MW = Mega Watt,
 SHP = Small Hydro Power
 MSW = Municipal Solid Waste

the potential of Jharkhand, Chhattisgarh and Uttaranchal, included in Bihar, Madhya Pradesh

and Uttar Pradesh respectively
 ## For industrial waste under energy from waste programme
 ### Sites identified

Annexure-III

State-wise achievements made under various programmes as on 31.03.2003

S1. STATES/UT Solar Wind SHP Biomass Biomass Energy
 No. Power Power Power Gasifier from
 (kWp) (MW) (MW) (kW) Wastes
 (MW)

1	Andhra Pradesh	275	92.60	155.61	160.05	15384	11.95
2	Arunachal Pradesh	0	0.00	32.10	0.00	180	
3	Assam	0	0.00	2.00	0.00	123	
4	Bihar	0	0.00	44.90	0.00	20	
5	Chhatisgarh	1.00	11.00	500			
6	Goa	0	0.00	0.05	0.00	22	
7	Gujarat	0	173.10	7.00	0.50	11361	2.45
8	Haryana	0	0.00	48.30	4.00	964	
9	Himachal Pradesh	0	0.00	93.24	0.00	7	
10	Jammu & Kashmir	0	0.00	102.24	0.00	120	
11	Jharkhand	4.05	0.00	0			
12	Karnataka	30	124.30	182.38	109.38	4499	1.00
13	Kerala	25	2.00	69.52	0.00	725	
14	Madhya Pradesh	339	22.60	38.96	0.00	4529	2.70
15	Maharashtra	185	401.20	206.33	24.50	3823	1.90
16	Manipur	0	0.00	5.45	0.00	0	
17	Meghalaya	0	0.00	30.71	0.00	0	
18	Mizoram	0	0.00	14.76	0.00	200	
19	Nagaland	0	0.00	20.47	0.00	0	
20	Orissa	0	0.00	7.30	0.00	72	
21	Punjab	250	0.00	107.40	22.00	700	0.75
22	Rajasthan	50	60.70	23.85	0.00	218	
23	Sikkim	0	0.00	35.60	0.00	0	
24	Tamil Nadu	211	990.30	76.40	106.00	2653	1.98
25	Tripura	0	0.00	16.01	0.00	1000	
26	Uttar Pradesh	325	0.00	21.50	46.50	2746	3.00
27	Uttaranchal	64.60	0				
28	West Bengal	50	1.10	92.28	0.00	2965	
29	Andaman & Nicobar	50	0.00	5.25	0.00	167	
30	Chandigarh	50	0.00	0.00	0.00	0	
31	Dadar & Nagar Haveli	0	0.00	0.00	0.00	0	
32	Daman & Diu	0	0.00	0.00	0.00	0	
33	Delhi	0	0.00	0.00	0.00	74	
34	Lakshwadeep	650	0.00	0.00	0.00	0	
35	Pondicherry	0	0.00	0.00	0.00	0	
36	Others	0	1.60	0.00	0.00	318	

Total 2490 1869.50 1509.24 483.93 53370 25.73

SHP = Small Hydro Power;
 U&I = Urban and Industrial Wastes Programme;
 MW = Mega Watt;
 kWp = kilowatt peak;

State-wise achievements made under various programmes as on 31.03.2003

S1. STATES/UT Biogas IBP/CBP Water Pumping Aerogen.
 No. Plants NBP WIND MILLS Hybrid System
 (Nos.) (Nos.) (Nos) (kW)

1	Andhra Pradesh	354334	132	5	16
2	Arunachal Pradesh	1721	0	0	0
3	Assam	53769	2	3	6
4	Bihar	123963	40	42	0

5	Chhatisgarh	8078	8				
6	Goa	3428	21	0	14.7		
7	Gujarat	359047	165	432	0		
8	Haryana	45414	59	0	0		
9	Himachal Pradesh	44194	8	0	0		
10	Jammu & Kashmir	2013	4	0	0		
11	Jharkhand	925	4				
12	Karnataka	365243	63	20	7.75		
13	Kerala	90823	163	79	8		
14	Madhya Pradesh	216970	120	0	0		
15	Maharashtra	687657	484	26	123.14		
16	Manipur	2026	4	0	0		
17	Meghalaya	2671	4	0	0		
18	Mizoram	3015	0	0	0		
19	Nagaland	1792	7	0	0		
20	Orissa	198692	45	0	0		
21	Punjab	72279	668	0	0		
22	Rajasthan	66735	71	222	4		
23	Sikkim	4125	0	0	10		
24	Tamil Nadu	203808	289	52	24.5		
25	Tripura	2069	0	0	0		
26	Uttar Pradesh	382784	1366	0	0		
27	Uttaranchal	2912	49				
28	West Bengal	220969	68	0	0		
29	Andaman & Nicobar	137	0	2	0		
30	Chandigarh	97	0	0	0		
31	Dadar & Nagar Haveli	169	0	0	0		
32	Daman & Diu	0	0	0	0		
33	Delhi	676	56	0	0		
34	Lakshwadeep	0	0	0	0		
35	Pondicherry	573	1	0	5		
36	Others	0	0	0	0		

Total 3523108 3901 883 219.09

IBP/CBP/NBP = Institutional/Community/Night Soil based Biogas Plants;
IREP = Integrated Rural Energy Programme;
Kw = Kilowatt

State-wise achievements made under various programmes as on 31.03.2003

S1. STATES/UT SOLAR PHOTOVOLTAIC SPV Solar
No. As on 31.3.2003 Pumps Cooker
SLS HLS SL PP (Nos) (Nos)

1	Andhra Pradesh	3648	1161	32152	21.656	603	11985
2	Arunachal Pradesh	738	750	4937	7.9	0	530
3	Assam	98	2787	541	7.5	45	80
4	Bihar	490	679	28275	0	128	450
5	Chhatisgarh	1237	3612	3192	0	5	37000
6	Goa	69	51	443	1.72	15	1500
7	Gujarat	1764	2552	31603	24.9	42	70410
8	Haryana	612	9666	32727	24.2	270	20615
9	Himachal Pradesh	1494	11948	20697	1.5	6	27280
10	Jammu & Kashmir	389	15317	9202	40	18	345
11	Jharkhand	135	102	16374	0	3	280
12	Karnataka	1009	6135	7334	18.91	337	250
13	Kerala	1090	18679	39681	44.7	749	195
14	Madhya Pradesh	5714	159	8564	22.4	76	141600
15	Maharashtra	3388	721	8683	6.44	189	56635
16	Manipur	370	650	3883	11	12	365
17	Meghalaya	593	540	4875	42	5	1165
18	Mizoram	315	1645	5812	0	37	110
19	Nagaland	271	143	95	6	0	0
20	Orissa	5665	2937	8795	36.52	4	3170
21	Punjab	1766	2870	14995	46	1580	22050
22	Rajasthan	6473	34864	4716	25.8	268	36600
23	Sikkim	271	143	95	6	0	20
24	Tamil Nadu	2272	471	12818	26	760	1355
25	Tripura	760	2238	20805	24.57	10	80
26	Uttar Pradesh	550	50938	52815	129.2	229	45310
27	Uttaranchal	250	32204	27027	80.03	9	7090
28	West Bengal	1461	26890	3662	475	48	7930

29 Andaman & Nicobar	358	405	796	167	25	60
30 Chandigarh	0	275	1675	0	14	1525
31 Dadar & Nagar Haveli	0	0	0	0	1	80
32 Daman & Diu	0	0	0	0	0	0
33 Delhi	301	0	4753	15	84	27990
34 Lakshwadeep	0	0	0	85	0	0
35 Pondicherry	62	13	637	0	21	90
36 Others	0	3295	28197	0	18	16685

Total 43613 234840 440856 1396.946 5611 540830

SLS = Street Lighting System;
HLS = Home Lighting System;
SL = Solar Lanterns;
PP = Power Plants;
SPV = Solar Photovoltaic;
BOV = Battery Operated Vehicles

Annexure-IV

State-wise cumulative funds released under various non-conventional energy programmes commencing 7th Plan, i.e., 1985-86 up to 2002-03

(Rs. in crore)

Sl.No. State/UT Total Funds released up to 31.03.03

1 Andhra Pradesh	157.58
2 Arunachal Pradesh	62.65
3 Assam	13.97
4 Bihar	27.81
5 Chhattisgarh	19.89
6 Goa	1.98
7 Gujarat	124.04
8 Haryana	42.44
9 Himachal Pradesh	66.01
10 Jammu & Kashmir	17.47
11 Jharkhand	2.50
12 Karnataka	129.91
13 Kerala	44.97
14 Madhya Pradesh	101.47
15 Maharastra	217.64
16 Manipur	15.33
17 Meghalaya	11.93
18 Mizoram	36.15
19 Nagaland	10.28
20 Orissa	77.00
21 Punjab	76.13
22 Rajasthan	72.38
23 Sikkim	33.92
24 Tamil Nadu	101.19
25 Tripura	14.74
26 Uttaranchal	8.69
27 Uttar Pradesh	255.33
28 West Bengal	117.81
29 Andaman & Nicobar	16.84
30 Chandigarh	2.20
31 Dadar & Nagar Haveli	0.14
32 Daman & Diu	0.09
33 Delhi	14.00
34 Lakshwadeep	18.36
35 Pondicherry	1.45
36 Others	239.35

Total 2153.61