

One of the major initiatives taken up in the area of Satellite Communication is the Satellite-aided Search and Rescue.

A number of ground-based, balloon and rocket-borne campaign experiments were conducted in the space science area.

Strengthening of the linkages with the Indian Industries has been one of the achievements. Space divisions have been set up in some of the major public sector organisations.

(b) The Programme proposed for Eighth Five Year Plan;

The Eighth Five Year Plan envisages two operational space systems, namely, INSAT system and IRS system, which will need to be maintained expanded to meet the projected demand of services, with the necessary in-orbit replacements and operational ground support systems. In the case of IRS system, the acquisition, processing and dissemination of the satellite data to the user community will also be a major responsibility to be discharged by the Department of Space. During the Eighth five Year Plan period, it is envisaged to complete the operationalisation of IRS-IB spacecraft, IRS-IC Spacecraft, INSAT-II Test Spacecraft, Augmented Satellite Launch Vehicle (ASLV), and Polar Satellite Launch Vehicle (PSLV), Development of Geo-synchronous Satellite Launch Vehicle (GSLV) and Cryogenics Engine and Stage is also an important activity proposed to be carried out during this period.

(c) After the successful launch and operationalisation of INSAT-2A satellite, the lease of 12 C-band transponders from ARABSAT has been terminated with effect from 15th September 1992 thus saving considerable foreign exchange.

INSAT-2A now carries all the traffic carried by ARABSAT-IC satellite. In addition many telecom circuits and additional TV regional services have been provided through INSAT-2A.

The Data relay service has been reinstated through INSAT-2A. An emergency alert system in the Indian Ocean region using the 406 MHz Satellite-aided Search and Rescue payload on INSAT-2A has been operationalised for the first time. India Meteorological Department uses operationally the improved VHRR imageries from INSAT-2A.

Development of Non-Conventional Energy Sources

*139. DR. K.V.R. CHOWDARY: Will the PRIME MINISTER be pleased to state:

(a) the project-wise progress made in research and development of Non-conventional Energy Sources so far;

(b) the steps proposed to be taken for the development of NCES during 1993-94; and

(c) the amount allocated in this regard during the above period?

THE MINISTER OF STATE IN THE MINISTRY OF NON-CONVENTIONAL ENERGY SOURCES AND MINISTER OF STATE IN THE MINISTRY OF AGRICULTURE (SHRIS. KRISHNA KUMAR): (a) The Ministry of Non-Conventional Energy Sources is carrying out research & development in various technologies of non-conventional energy sources through IITs, Universities and various other scientific and technical institutions in the country. The project programme-wise progress made in research & development of non-conventional energy sources so far is given at statement-I

(b) and (c). For the development of non-conventional energy sources during 1993-94, it is proposed to extend financial assistance for R & D, demonstration and extension programmes in the field of Biogas, Improved Chulha, Solar Thermal, Solar photovoltaics, Biomass, Bio-energy, Small Hydro Power, New Technology, Alternate fuel, and Ocean Energy, to be taken up through various scientific and technical Institutes and State Nodal Agencies. The physical targets for the installation of various types of non-conventional energy systems and devices through out the country are to be generally stepped up during 1993-94 than the current financial year's level. Programme-wise proposed financial Central outlay and physical targets are given at statement-II.

In addition to budgetary support, efforts have been made by the Government to

mobilise resources from the World Bank and other bilateral agencies. It has been possible to receive commitment to the tune of US \$ 145 million for exploiting the potential in small hydro, wind energy and solar photovoltaics for the Renewable Resources Development project. The World Bank (International Development Agency), Global Environment Facility (GEF) and the Government of Switzerland are participating in financing this project. In addition, Danish Government (DANIDA) assistance for the project is also under consideration. Through the assistance likely to be received under the above project and to be lent to private entrepreneurs and others through Indian Renewable Energy Development Agency (IREDA), it is envisaged to add an aggregated capacity each of 100 MW through small hydro projects, 85 MW through wind farms and 2.5 MW through solar photovoltaic systems.

STATEMENT

<i>Sl.No.</i>	<i>Project/Programme</i>	<i>Progress/achievements</i>
1	Biogas	Development of: <ol style="list-style-type: none"> (i) Biogas plant with ferro cement digester. ii) Biogas plant with FRP gas holder. iii) Pargati model biogas plant iv) Deenbandhu model biogas plant. v) Portable biogas plant made of rubberised nylon. vi) New design for alternate feed stocks vii) Pre-fabricated ferro cement KVIC type of biogas plant. viii) Fungal culture for pre-treatment of fee-stock for increased biogas production.

<i>Sl No</i>	<i>Project/Programme</i>	<i>Progress/achievements</i>
		ix) Methodologies for use of biogas slurry for value added products
		Development of
2	Improved Chulhs	i) Various types of fuel Chulha efficient improved chulhas
		ii) Mud-clad pottery/ceramic improved chulhas
		iii) Metal-clad-ceramic chulhas
		iv) Metallic chulhas
		Development of
3	Solar Thermal	i) Solar water heating systems
		ii) Solar cookers
		iii) Solar distillation units
		iv) Solar wood seasoning kilns
		v) Solar passive architecture
4	Solar Photovoltaics	i) Development of indigenous technologies and manufacturing base for crystalline silicon solar cells
		ii) Development of technology for fabrication of amorphous silicon solar cells
		iii) Commissioning of amorphous silicon modules production plant
		iv) Development of 10 tonne per annum capacity polly silicon production reactors
5	Biomass	i) Identification, screening testing of fuel-wood species for increased biomass yield

<i>Sl No</i>	<i>Project/Programme</i>	<i>Progress/achievements</i>
		<ul style="list-style-type: none"> ii) Development of package of practices fuel-wood species suitable for different agro-climatic regions iii) Development and installation of 50 litres per day capacity pilot plant for production of fuel from ligno-cellulosic residues iv) Development of briquetting plant for production of solid fuel from biomass wastes
6	Bio-energy	<ul style="list-style-type: none"> i) Characterisation of 200 biomass samples for their suitability for pyrolysis and gasification ii) Development of 37 - 100 KW gasifier systems iii) Development of up draft rice husk gasifier iv) Development of equipment for determination of tar in producer gas v) Development and installation of pilot plants for production of biogas through various agricultural and industrial wastes, such as fruit and food processing, willow dust based, horse dung, kitchen wastes, distillery effluent, hospital wastes, tannery wastes, water hyacinth, sugar cane press mud, banana wastes, eucalyptus leaves
	composite agriculture waste	
7	Small Hydro Power low head turbine	<ul style="list-style-type: none"> i) Development and installation of ultra ii) Development and installation of cross-flow turbines of 10-50 KW capacities iii) Development and installation of medium head micro hydel iv) Development and installation of high head micro hydel

<i>Sl.No.</i>	<i>Project/Programme</i>	<i>Progress/achievements</i>
8.	New Technology	<ul style="list-style-type: none">i) Development of photo-electro-chemical cell with an efficiency of 17% on small areas.ii) Development and demonstration of 2.5 KW capacity fuel cell.iii) Development, production and storage system in the form of hydride.iv) Development and demonstration of hydrogen powered motor-cycle with 25 MW range.v) Development and testing of hydrogen fuelled 2.5 H.P. engine,vi) Development and commissioning of 5 MW thermal input Magneto-Hydrogen-Dynamics (MHD) Pilot Plant.vii) Development and commissioning of 7 KW Geo-thermal based Pilot Plant for power generation.
9.	Alternate Fuel	<ul style="list-style-type: none">i) Development of 1 tonne pay-load battery vehicle.ii) Development of Thyristarised Chopper controller for battery vehicles.iii) Use of methanol as an alternate fuel in diesel vehicles.iv) Bio fuel operation aof diesel vehicles with alcohol..v) Preparation of techno-economic status report on use of Compressed National Gas' in transport vehicles of Gujarat.
10.	Ocean Energy	<ul style="list-style-type: none">i) Extraction of energy from sea waves.ii) Material research in ocean and environment.

STATEMENT II

<i>Sl. No.</i>	<i>Programme</i>	<i>Outlays (Rs. in crores)</i>	<i>Tentative Physocal Targets</i>
1.	Biogas Development Programme	66.00	
	a. Family Size Plants		1,60,000 Nos.
	b. CBP/IBP/NBP		50 Nos.
2.	Improved Chulha Programme	19.80	22,50,00 Nos.
3.	Solar Thermal Programme	13.00	
	a. Solar Thermal Energy Systems		55,000 m ²
	b. Family Size Solar Cookers		40,000 Nos.
	c. Community Type Solar s Cooker		
4.	Solar Energy Centre	3.00	
5.	Solar Photovoltaic Programme	16.00	
	a. SPV Street Lighting System		400 Nos.
	b. SPV Domestic Lighting System		1, 000 Nos.
	c. Portable Lights		10,000 Nos.
	d. SPV Power Plants		200 KW
	e. Other SPV Systems		300 Nos.
6.	Wind Energy Programme	17.00	
	a. Wind Pumps		500 Nos.
	b. Wind Battery Chargers		50 Nos.
	c. Wind Farms		6 MW
7.	Urjaram Programme	0.25	

<i>Sl No</i>	<i>Programme</i>	<i>Outlays (Rs in crores)</i>	<i>Tentative Physocal Targets</i>
	a Urjagram Pilot Project		25 Nos
	b Energy Syrveys		100 Nos
8	Biomass Development Programme	2 00	
9	Human and Animal Energy Programme	0 25	
10	Bioenergy Development Programme	5 75	
	a Gasifiers/ Stirling Engines		1 MW
	b Biomass Based Cogeneration of Power		6 MW
11	Small Hydel Power Development Programme	18 00	10 MW
12	Alternate Fuels for Surface Transporation	1 50	
	a Battery Operated Vehciles		50 Nos
	b Alcohol Operated Vehciles		70 Nos
13	magneto Hydro Dynamics	0 75	
14	Geo-thermal Energy	0 20	
15	Chemical Sources of Energy	0 50	
16	Ocean Energy	0 10	
17	Hydrogen Energy	0 45	
18	Indian Renewable Energy Development Agency Ltd	6 00	
19	Regional Offices etc	0 75	
20	Information & Publicity	0 75	

<i>Sl No</i>	<i>Programme</i>	<i>Outlays (Rs in crores)</i>	<i>Tentative Physocal Targets</i>
21	Seminars/Conferences	0 03	
22	International Cooperation	0 30	
23	Data bank/TIFAC	0 02	
24	Special Demonstration Projects	2 50	
25	Energy Conservation	0 10	
26	Solar Photovolatic Pumps	28 00	
	a SPV Water Pumping Systems		1,000 Nos
27	Solar Thermal Power Plant	1 00	
Total		204 00	

Loan to Bihar by HUDCO

*140 SHRI SURYA NARYAN YADAV,
Will the Minister of URBAN DEVELOPMENT
be pleased to state

(a) the amount of loan advanced to
Bihar by HUDCO during each of the last
three years

(b) the amount of loan repaid so far
and

(c) the schemes of Bihar still pending
with HUDCO for approval?

THE MINISTER OF URBAN DEVELOPMENT (SHRIMATI SHEILA KAUL) (a)
The loan sanctioned by HUDCO to different
borrowing agencies of Bihar during the last
three years is reported as under -

<i>Year</i>	<i>No of Schemes</i>	<i>Loan sanctioned (Rs in crores)</i>
1991-92	6	10 48
1990-91	15	24 50
1989-90	4	17 29

(b) The amount of loan, repaid by various agencies of Bihar to HUDCO is reported to be Rs 30 98 crores

(c) The details of schemes of Bihar pending with HUDCO are given in the attached statement