CHAPTER 24

ENERGY

The Ninth Five Year Plan envisaged substantial additions to capacity and production in the energy sector. The Mid-term review indicates there would be significant shortfalls in capacity in critical sectors. Capacity expansion in the Power Sector is much below expectations. The achievements in the State Sector will be close to target but there are significant shortfalls in the Central Sector and in the Private Sector. Poor financial health and accumulated losses of the State Electricity Boards (SEBs) continues to be a cause of serious concern. The process of reforms, including especially the setting up of regulatory authorities in power sector has been initiated but much more remains to be done. The progress of rural electrification programme continues to be far from satisfactory.

2. In the petroleum sector refining capacity is expected to exceed targets mainly because of over achievement in the private sector. The areas of concern, however, are stagnating indigenous production of crude oil, lower reserves accretion, increasing imports and the recent steep increase of international oil prices. An ambitious programme of reforms in the petroleum sector have been initiated and the sector is proposed to be fully deregulated by the end of Ninth Plan, but implementation of the proposed dismantling of the administrative price mechanism (APM) has slipped in some areas.

3. Coal continues to remain the main source of commercial energy in the country. There have been shortfalls in coal consumption mainly due to sluggishness in the industrial sector, non-materialisation of envisaged new coal based thermal capacity additions and imports of coal. This resulted in lower production of coal in first two years of the Plan and downward revision of demand projections and production targets. The legislative amendments to permit private sector in commercial coal mining have not come through. Efforts have been initiated to expedite the exploration activities for upgradation of reserves to proven category in areas outside the leasehold of National Coal Companies (NCC).

Trends in Primary Commercial Energy Supply

4. Trends in the primary commercial energy supply during first three years of the Plan are given in Table 1. As can be seen, the primary energy availability registered an annual average growth rate of 5.2% as against the anticipated annual growth rate of 6.8% for the Plan period as a whole. The growth rate of GDP in this period was 5.9% which is also lower than the Plan target of 6.5%. However, it does appear that the elasticity of demand for primary energy is somewhat lower than was envisaged when the Plan was formulated.

Table 1
Trends in Supply of Primary Commercial Energy

	1996-97 Actual	1997-98 Actual	1998-99 Actual	(MTOE) 1999-2000 Target
Indigenous Production				
Coal	122.80	127.17	125.61	128.88
Lignite	6.05	4.86	4.88	4.70
Crude Oil	32.90	33.83	32.91	33.04
Natural Gas	18.89	22.57	23.45	24.03
Hydro Power	5.90	6.42	7.12	6.98
Nuclear Power	2.35	2.62	3.13	2.87
Total	188.89	197.47	197.10	200.50
Net Imports	57.23	58.33	66.06	84.90
Stock Changes (-)	6.21	6.00	6.54	6.2*
International Bunkers (-)	0.16	0.10	0.10	0.1*
Total Commercial Energy Supply	239.75	249.70	256.52	279.10

* *Estimated*

Requirements of Primary Commercial Energy

(i) Petroleum

5. As per initial estimates, the demand of petroleum products was estimated to be 104.8 million tonnes (excluding liquid fuel requirement for power generation) in terminal year of the Plan. The actual growth rate during first three years of the Ninth Plan works out to 6.8%. If this growth trend continues, the consumption of petroleum products would be about 110 million tonnes during the year 2001-02, including liquid fuel requirement for power generation.

6. The projected crude oil and natural gas production from indigenous sources at terminal year of the was 36.98 million metric tons (MMT) and 30.70 BCM respectively. The actual production during 1997-98 and 1998-99 has been lower than the targets and as such the Plan target may not be achieved.

7. The refining capacity was targeted to increase from 61.5 MMT in 1997-98 to 113.95 MMT by terminal year of the Ninth Plan but the present estimates indicate that the capacity may go up to 129.04 MMT by end of the Plan and is expected to be more than adequate to meet the domestic demand.

Dependence on Imports

8. In view of the stagnant domestic oil production, higher oil imports appear inevitable. Hence, the energy import dependence was expected to increase from about 25 percent at the end of Eighth Plan to about 28 per cent by the end of

Ninth Plan. The actual imports of crude oil and petroleum products during 1998-99 were 39.8 MMT and 18.09 MMT respectively. It is estimated that 63.94 MMT of crude oil and 10.36 MMT of petroleum products would be imported during 1999-2000. In addition, 5.70 MMT of petroleum products would be imported by private sector. If the same trend continues, the import requirement of crude oil during the terminal year of Ninth Plan would be in the range of 85-90 MMT depending upon the level of operation of refineries.

(ii) Coal

9. Coal consumption in first two years of the Plan registered a negative growth of 0.8% against the envisaged average annual compounded growth of 6.85%. Main reasons for shortfall have been sluggishness in the industrial sector, slippage in the materialization of new coal- based thermal power stations, lower coal offtake by the power sector due to resource constraints, lower offtake by steel sector due to slump in the demand for steel and lower offtake by cement sector due to recourse to duty free imports of coal against cement exports. The downward revision of sectoral targets of the major coal consumers like Power and Steel has necessitated revision of the Ninth Plan target of coal demand, which is now fixed at 370.80 million tones (mt) excluding 7.7 mt. washery middlings in the terminal year, implying a revised growth rate of 4.6% against 6.85% envisaged initially. Correspondingly, the coal production target in 2001-2002 has been revised from 370.60 mt to 328.86 mt implying a growth of 2.86% against 5.34% envisaged initially.

(iii) Electricity

10. The Ninth Plan envisaged a power generation target of 662 billion Kwh at the terminal year, of which 606.7 billion Kwh is targeted from the utilities and the balance from non-utilities. The annual growth rate of electricity generation for first three years of the Plan from the utilities works out to about 6.8 percent as against the targeted estimates of 9 percent growth rate per annum. If the same trend continues, the generation from the utilities in 2001-02 would be of the order of 527 billion Kwh as against the initial estimates of 606.7 billion Kwh implying a shortfall of about 79 billion Kwh. However, the non-utilities sector is likely to achieve the target of 55.3 billion Kwh in 2001-02.

11. The Ninth Plan envisaged a capacity addition target of 40,245 MW. A capacity addition of 12,035 MW has been realized in first three years of the Plan. It is estimated that the feasible capacity addition for the remaining two years would be of the order of 12,274 MW making a total feasible capacity addition of 24,309 MW during the Ninth Plan achieving 60% of the Plan target.

12. The Ninth Plan envisaged a total import requirement of 78 MMT of crude oil, 21.3 MMT of coal and 2 BKwh of electricity from Bhutan in the terminal year of the Plan. The revised estimates of the Ninth Plan indicate a requirement of 89 MMT of crude oil, 14.51 MMT of coal and 1.5 BKwh of electricity from Bhutan. Table 2 above summarises the production, consumption

and import requirement of commercial energy in terminal year of the Ninth Plan.

Table 2

Production, Consumption and Import Requirement of Primary Commercial Energy in 2001-02

	As per Ninth Plan	As per Mid-Term Rev	Additional Imports
COAL			
- Production (MMT)	370.6	328.86	
- Demand/Consumption (MMT)	412.2	370.80	
- Imports (MMT)	21.3	14.51	Nil
LIGNITE			
- Production (MMT)	45.0	45.00	
CRUDE OIL			
- Production (MMT)	37.0	35.65	
- Consumption (MMT)	104.8*	110.00	
- Imports (MMT)	78.0	89.00	11
NATURAL GAS			
- Production (MCM)	29165.0	27500.00	
Electricity			
Hydro Capacity (MW)	31464.5	29610.30	
Nuclear Capacity (MW)	3105.0	3105.00	
Wind Generation (GWH)	1150.0	1150.00	

*Note:- * Excluding demand for power generation*

Final Commercial Energy Consumption

13. The share of coal is declining in the final commercial energy consumption while that of oil & gas and electricity is increasing. Oil and gas accounted for nearly 54 percent of the final energy consumption in 1996-97. The demand for commercial energy for final consumption in the Ninth Plan depends upon the rate of growth in the economy and the concomitant demand from different consuming sectors. Table 3 gives the final commercial energy consumption estimated on the basis of end-use analysis and co-relation of the past consumption with GDP growth at the end of Ninth Plan . The revised estimates are based on the assumptions considered for the Ninth Plan projections.

Table 3

Projected Demand for Final Consumption of Commercial Energy in Ninth Plan

		As per Ninth Plan	As per Mid-Term Review
Electricity	(BKwh)	496.1	434.9
Petroleum Products	(MMT)*	104.8	110.0**
Coal	(MMT)*	114.0	110.0
Natural Gas	(BCM)*	15.73	14.5

Note:- * *Excluding demand for power generation*
** *Including demand for power generation*

14. At present, about 70 percent of the coal consumption, 4.5 per cent of liquid fuels consumption and about 40 percent of natural gas consumption are for power generation.

15. The Mid-Term Review shows that the final commercial energy consumption is lower in cases of coal, natural gas and electricity. As far as coal is concerned, the direct consumption requirements have come down in power and industrial sectors. The increase in demand for petroleum products is mainly accounted for by transport and power sectors.

16. The mid-term appraisal of various sub-sectors of energy sector is given in the following paras.

POWER SECTOR

Targets and Thrust Areas

17. The main thrust areas in Power Sector are: accelerated completion of ongoing projects, maximisation of benefits from existing plants, setting up of appropriate institutional and legislative mechanism for reforms and restructuring of the power sector, improving the reliability and quality of power supplies to consumers, undertaking advance action on hydel projects, setting up of high-capacity inter-regional transmission links to facilitate evacuation of power from mega projects , formation of an integrated National Grid, streamlining procedures for clearances and investment decisions in public sector and encouragement to captive and co-generation power plants.

The Mid-Term Review :

Generation

18. Against a targeted growth rate of 9 % during the Plan, the electricity generation during first three years in public utilities was about 6.76% (say 6.8%) annually. If the trend continues, generation by utilities in 2001-2002 may be of the order of 527 billion kwh against the target of 606 billion kwh from the utilities, i.e. a shortfall of 79 billion kwh.

19. Going by the present trends, the generation from non-utilities, however, is expected to achieve the target of 55.3 billion kwh . .

Capacity Addition

20. Tables 4 & 5 below indicate the targets and achievements for capacity addition during first three years and likely achievement for the last two years of the Plan period. Expected achievement in the 9th Plan period is 92% for the State Sector, 56% for the Central Sector and only 44% in the Private Sector. Private Sector projects have not come up as expected mainly because the policy framework needed to encourage private investment, has not yet been put in place. The poor financial condition of the SEBs is a major constraint on achieving financial closure.

TABLE – 4

Targets and Achievements in capacity additions in the Ninth Plan Period

(in MW)

	9th Plan Target	1997-98 Actual	1998-99 Actual	1999-2000 Actual	2000-01 Target	2001-02 Likely	9th Plan Revised
Centre	11909	333	992	1615	659	3115	6714 (56.38)
State/UTs	10748	1676	1675	2329	2415	1798	9893 (92.05)
Private	17588	1277	1575	563	926	3361	7702 (43.79)
TOTAL	40245	3286	4242	4507	4000	8274	24309 (60.40)

(The figures in the brackets indicate achievement in terms of percentage)

TABLE - 5
Generating Capacity Anticipated at the end of the Ninth Plan (in MW)

	Hydro	Thermal	Nuclear	Total
Capacity as on 31.3.1997	**21658.1**	**61912.3**	**2225.0**	**85795.4**
Likely Addition during Ninth Plan	*7952.2*	*15477.2*	*880.0*	*24309.4*
Total Installed Capacity On 31.3.2002	**29610.3**	**77389.5**	**3105.0**	**110104.8**

21. Slippages in hydel capacity would be 19% and in thermal capacity a high 48% . A nuclear energy capacity addition of 880 MWs would be fructified during the plan period. Sector-wise percentage slippages are: Central 44 percent, States around 8 percent and Private 56 percent. The slippages in State sector are low as most of the projects are carried forward from the Eighth Plan. However, the high level of slippages in Central and Private sector projects are a major cause of concern. The main reason for private sector slippage is non-achievement of financial closure of the projects..

Renovation & Modernisation (R&M) Programme

Thermal Power Stations

22. The All-India average Plant Load Factor (PLF) of thermal power plants increased from 55.3% to 64.4% during Eighth Plan. This was primarily due to Renovation and Modernisation efforts. While Phase-I of R&M has been completed, Phase-II is under implementation by Ministry of Power/CEA (Central Electricity Authority) in consultation with State Governments. This Phase covers 44 Thermal Stations (consisting of 198 Thermal Units with a total capacity of 20,869.435 MW). After the completion, the programme promises: (i) additional generation of 7,864 MU/Year (ii) increase of 100 MW peaking capacity and (iii) life extension of 24 Thermal Units by 15-20 Years.

Hydro Electric Power Stations

23. The programme for R&M and uprating of Hydro Power Stations covers 55 identified schemes (210 nos. of generating units) with an aggregate capacity of 9653 MW. . The estimated cost of these schemes adds up to Rs.1,493 crore and the schemes are to offer 2431 MW/7181 MU. Work on 25 of those schemes -- with an aggregate installed capacity of 5791 MW – has been completed at an estimated cost of Rs.465.37 crore and the expected benefit is 1303.48 MW/3262 MU. The remaining hydro R&M schemes need to be expedited during rest of the Plan period.

Share of Hydel Generation

24. Hydel generation had a 41% share at the beginning of Sixth Plan; it came down to 25.2% when the Ninth Plan began. However, with a feasible capacity addition (7952 MW), this share would improve to 26.9% by end of the Ninth Plan period.

25. As per Central Government's Mega Power Policy, benefits to Hydro Projects apply to 500 MW capacity and above supplying power to more than one State in case of Central/Private sector projects . This facility should also be extended to joint sector projects. Alongside, the potential for pumped storage schemes also merits consideration. Since the power supplied by pumped storage plants during peak hours is costlier, time of the day (ToD) metering needs to be made compulsory to absorb such power so as to obtain maximum economic benefits. Further, there is also a need to encourage pumped storage scheme with suitable incentives as applicable to mega power projects.

26. For the development of hydro power, the Centre announced a Hydro Power Policy in August, 1998 which envisages creation of a `Power Development Fund'. The dedicated fund would be used for carrying out activities like developing hydro power projects. The policy needs to be implemented with all seriousness.

Financial Performance of State Electricity Boards

27. The financial health of the SEBs has deteriorated over the years due to low tariff and large subsidies in agriculture and domestic sectors and poor operational efficiency. Table 6 gives the financial performance of the State power sector The commercial losses of SEBs have increased from Rs.4117 crore in 1991-92 to an estimated Rs.20,707 crore in 1999-2000. The net subsidy of Rs. 5,404 crores on agriculture and domestic sectors in 1991-92 -- at 50% of Central Plan Assistance flowing to States/Union Territories (UTs) -- has jumped several fold to Rs. 29,113.4 crores in 1999-2000 which is more than 88% of the funds flowing from Central Plan Assistance to States/UTs during the year. This is a matter of concern and needs to be arrested.

TABLE – 6

FINANCIAL PERFORMANCE OF THE STATE POWER SECTOR

(Rs. Crore)

		1991-92	1998-99	1999-2000(RE)	2000-01 (AP)
A.	Gross Subsidy involved				
(i)	On account of sale of electricity to				
(a)	Agriculture	5938.00	22536.86	25576.68	28217.24
(b)	Domestic	1310.00	7270.13	7892.87	9387.14
(c)	Inter-State Sales	201.00	538.44	351.07	357.75
	Total	7449.00	30345.43	33820.62	37962.13
(ii)	Subventions Received from State Govts.	2045.00	7851.87	4707.23	5562.55
(iii)	Net Subsidy	5404.00	22493.56	29113.39	32399.58
(iv)	Surplus Generated by sale to other sectors	2173.00	6876.82	6090.61	6901.73
(v)	Uncovered Subsidy	3231.00	15616.74	23022.78	25497.85
B.	Commercial Losses @	4117.00	18081.29	20706.58	22346.32
C.	Revenue Mobilisation				
(i)	Rate of Return (ROR) %	-12.70	-27.51	-31.00	-30.66
(ii)	Additional Revenue Mobilisation from achieving				
(a)	3% ROR	4959.00	19987.06	22709.86	24533.04
(b)	From introducing 50 paise/unit from Agriculture/Irrigation	2176.00	2734.14	2912.67	2746.47

PROGRESS AT A GLANCE

- Against the Plan target of 40,245 MW capacity addition the anticipated achievement is expected to be 24309 MW or 60.4%.
- Capacity addition in the Central sector would be 6714 MW (56.4%) against 11,909 MW.
- Capacity addition in State Sector would be 9893 MW (92.0%) as against the target capacity of 10,748 MW.
- Capacity addition in the private sector is expected to be 7702 MW which is only about 44% of the target of 17588 MW. The major reason for the large shortfall in the private sector is the financial unviability of the SEBs which makes it difficult even for approved private sector projects to achieve financial closures.
- The slippages in the case of hydro capacity would be about 19% and for thermal capacity as high as 48%.
- The capacity addition in Nuclear Power would be achieved as envisaged.
- The financial position of SEBs is a matter of grave concern. The Internal Resources of the SEBs continue to be negative. It was expected to be (-) Rs. 3399 crore in 1998-99 and the commercial losses (without subsidy) (-) Rs. 18081 crore during the same period. In order to achieve 3% ROR on the net fixed assets as envisaged in the Electricity (Supply) Act, 1948, the average tariff needs to be increased by 60 paise/unit on All-India basis (ranging from 23.8 paise/unit to 261.7 paise/unit).
- The likely achievement of village electrification during the Plan period would be 43% and of pumpset energisation 75% of the target envisaged for the Ninth Plan period.

Plan Outlays

28. The Ninth Plan-approved outlay for power sector is Rs 1,24,526.41 crore representing 14.5% of total public sector outlay. Tables 7 & 8 below indicate the progress on Plan expenditure (State & Centre) and financing of Central Sector :-

TABLE – 7

Plan Expd. during first 3 years of the Ninth Plan and expected level in last 2 years

(figures in brackets are at 1996-97 price level).

S. No.	Year	Central	State	Total
1	9th Plan (Approved)	(53,299)	(71,227)	(1,24,526)
2	1997-98 (Actual)/R.E	6844 (6479)	11,893 (11,258)	18,737 (17,737)
3	1998-99 (Actual/R.E)	8157 (7230)	13,244 (11,738)	21,401 (18,968)
4	1999-2000 (R.E)/Appd.	9,367 (7832)	15,594 (13,039)	24,961 (20,871)
5	First 3 Years (1997-2000)	(21,541)	(36,035)	(57,576)
6	Expected In last 2 years	(25,063)	(30,600)	(55,663)
7	Likely investment	(46,604)	(66,635)	(1,13,239)
8	(%) Utilisation	87.4	93.6	90.9

TABLE - 8

Financing of Central Sector Investment during Ninth Plan

Sl.	YEAR	IEBR	GBS	Outlay
1.	9th Plan (Approved)	(34714)	(18586)	(53299)
2.	1997-98 (Actual)	3709 (3511)	3135 (2968)	6844 (6479)
3.	1998-99 (Actual)	4703 (4169)	3454 (3061)	8157 (7230)
4.	1999-2000 (R.E)	5712 (4776)	3655 (3056)	9367 (7832)
5.	First 3 Years (1997-2000)	14124 (12456)	10244 (9085)	24368 (21541)
6.	Expected In last 2 years	(17463)	(7600)*	(25063)
7.	Likely investment	(29919)	(16685)	(46604)
8.	% of 9th Plan	86.2	89.8	87.4

* *Assumes @ 10% growth in nominal terms over the level of 1999-2000.*

Nuclear Power

29. The operational performance of nuclear power stations in first two years of the h Plan has improved quite significantly compared to the Eighth Plan. The average PLF of existing nuclear power stations has increased from 55.90% in 1996-97 (at the end of the Eighth Plan) to 62.3 % in 1997-98 and 74.4% in 1998-99.

30. The approved Plan outlay for Nuclear Power is Rs 5,842 crore. The likely expenditure, at constant prices, in first 3 years of Plan is 40.5 per cent of the approved outlay as against the pro- rata level of 60 per cent.

31. Development of nuclear energy is crucial in the context of energy security and of the need for clean energy. Government has constituted a High Powered Committee to recommend development of strategies and policies for rapid development of nuclear power and to draw up a long-term plan of implementation . Typically, a nuclear power project has a gestation period which is very long -- generally longer than the repayment period for resources raised for the purpose. It is, therefore, essential that concerted effort is made to design equipment parameter etc. with a view to reducing the gestation period.

Transmission & Distribution Management

32. Transmission and Distribution (T&D) losses in the system are very high at 22% and contribute to the financial weakness of the SEBs. There is also evidence that the actual level of T&D losses in the system is much higher than officially reported. For example in Orissa when T&D losses were calculated, the loss which was earlier reported at 23.8% in 1994-95 was re-estimated as 50.4% in 1996-97. This has also been found in other states. It appears that electricity supply to Agriculture, which is not metered, was being exaggerated so as to show lower levels of T&D losses. The very high level of losses on this account is partly due to technical deficiencies in the distribution system because of prolonged neglect of investment but a much larger part of the loss reflects theft of electricity, often with the connivance of the distribution staff. Privatisation of distribution and introduction of multiple players in the distribution sector would promote competition and improve efficiency in the sector which could facilitate the ultimate objective of introducing bulk/retail competition. Privatising distribution of power has significant political, social and financial implications which need to be addressed while formulating policies for distribution in each state.

33. Investment in transmission facilities – a key for the development of Power Sector -- has not kept pace with investment in generation . The present level of All India T&D (transmission and distribution) losses is about 22% while the losses in some States are much higher. The Government has amended the Electricity Act 1998 to treat transmission as separate activity to facilitate private investment in this sector. It has become essential that the transmission system be planned in an integrated manner at State and Central levels for maximum economic benefits and to initiate measures to attract private investment.

34. The tax concessions as are available to generating entities should also be extended to transmission and distribution entities as otherwise States will be discouraged from initiating reforms which are perceived inevitably to increase tariffs.

Captive/Co-generation Plants

35. In the Eighth Plan period, the Central Government adopted a policy to encourage establishment of captive/co-generation plants by large industrial units to meet the rapidly increasing demand for power. Ministry of Power issued policy guidelines for sale of excess power by captive plant owners to the grid, access to the transmission grid on payment of wheeling charges, third party sales, etc. Because of these efforts, the installed capacity of non-utility power having capacity more than 1 MW increased from 9302 MW to 12,078 MW during the Eighth Plan period. However, most of the State Governments are yet to formulate clear and transparent policies for purchase of captive power which could provide fair return to the captive/co-generation power plant owner; as a result the existing capacity is being under-utilised (e.g. less than 30% in Karnataka). A clear approach would be to formulate policies and set up institutions to ensure that bulk consumers are able to buy power from suppliers of their choice.

Independent Regulatory Commissions for Power

36. An essential element in reform of the Power Sector is the establishment of independent regulatory agencies responsible for setting tariffs and regulating power purchase agreements. Accordingly, the Central Government has enacted Electricity Regulatory Commission Act, 1998 for setting up of independent regulatory bodies viz. Central Electricity Regulatory Commission (CERC) and State Electricity Regulatory Commissions (SERCs) at the Central and State levels respectively. These regulatory bodies would primarily look into all aspects of tariff fixation and matters incidental to it. CERC was constituted in July, 1998 and is in operation. Fourteen States have set up their SERCs. The remaining States need to set up their respective SERCs at the earliest.

Reforms and Restructuring of State Electricity Boards

37. Power sector reforms aim to generate electricity at economic cost, provide reliable and high quality service to the consumers and ensure that the sector is financially viable and also offers an attractive environment to bring in private investments. Focus of reforms so far has been on promoting private investment in generation, improving regulatory environment both at Central and State levels and re-structuring/unbundling of State Electricity Boards into separate generation/transmission and distribution entities. Setting up such corporations makes it possible to monitor efficiency levels in each activity and also create appropriate incentives for efficiency in each area. Unbundliing also makes it easier to allow entry of private sector operators in each area in a

suitable manner which ensures competitive environment . Several States have initiated power sector reforms along these lines. However, the progress in this respect continues to be very slow. Some State Governments have taken concrete steps towards the reforms. Other States are also taking initiatives in this regard.

POWER SECTOR REFORMS – Where We Stand ?

- Power sector reforms were expected to focus on two thrusts. One was the establishment of rational tariff structures through independent regulatory commissions. The second was the restructuring of State Electricity Boards separating generation from transmission and distribution to bring about greater efficiency in each area. These reforms are now under way, though the process is far from complete.
- The Electricity Regulatory Commission Act, 1998, which provides for a legal basis for setting up of a Commission at the Central level and a separate Commission at the State level, is in place.
- The Central Electricity Regulatory Commission (CERC) was constituted in July, 1998 and is in operation.
- State Electricity Regulatory Commissions (SERCs) have been set up in 14 States. While Orissa, Haryana and Andhra Pradesh have set up SERCs under their own Act, the other States viz. Uttar Pradesh, Karnataka, West Bengal, Tamil Nadu, Punjab, Delhi, Gujarat, Madhya Pradesh, Arunachal Pradesh, Maharashtra and Rajasthan have set up SERCs under the Central ERC Act.
- Status on Re-structuring of SEBs

Orissa : Orissa Electricity Reforms Act, 1995 - in operation.

OSEB unbundled into:

- OHPC for hydro
- OPGC for thermal
- GRIDCO for transmission.

Orissa divided into four zones for distribution by four subsidiaries of GRIDCO (in the Joint Sector). BSES has taken over 3 zones viz. Western, North-Eastern and Southern . The Central zone has been offered to AES Ltd.

Haryana: Haryana Electricity Reform Act 1998 in operation. HSEB unbundled into:

- HPGC for Generation
- HVPNL for Transmission & Distribution.

Two distribution companies established:

- North Discom (likely to be Joint Venture).
- South Discom

Andhra Pradesh: Andhra Pradesh Electricity Reform Act, 1998 in operation. APSEB unbundled into:

- Andhra Pradesh Gen. Co. for Generation
- Andhra Pradesh Transco. for Transmission & Distribution

Number of distribution companies to be formed.

Uttar Pradesh: UPSEB has been unbundled into three Corporations viz. UP Thermal Generation Corporation , UP Hydro Generation Corporation and UP Power Corporation (for T&D works) .

Setting up Mega Power Projects

38. A Mega Power Policy was approved by the Central Government to enable setting up large capacity plants supplying power to more than one State. Such mega plants would have a capacity of 1000 MW and above in case of thermal and 500 MW and above for hydro projects. Certain incentives such as exemption from custom duty etc. would be extended to those projects. A Power Trading Corporation (PTC) envisaged by the policy will purchase power from the mega projects and sell it to the SEBs under a bilateral agreement between the PTC and the SEBs. If a SEB defaults in paying, the policy provides for recourse to deduct from the State share of Central Plan Assistance (CPA) and other devolution and pay to the PTC. However, certain issues such as impact of the proposed adjustment of defaulting dues on priority schemes under social sector need to be resolved to the satisfaction of all concerned.

Enhancing the CEA Limit for TEC Clearance

39. The Government has initiated action to streamline the Techno Economic Clearance (TEC)/investment clearance for new projects in the public sector. For private sector, the limit of TEC by Central Electricity Authority has been raised up to Rs.5,000 crore for tariff-based thermal projects on competitive bidding and to Rs 1,000 crore for such other private thermal projects based on tariffs. For private hydro projects which are based on competitive bidding, the ceiling limit has been kept at Rs.1,000 crores.. The ceiling is Rs.20,000 crore.in case of project prepared by a Generating company not wholly or partly owned by Central or a State Government for supply of power to more than one State and approved in accordance with a scheme proposed by any Committee or Body authorised by Central Government,

Private Sector Investment

40. Many domestic and foreign parties have expressed interest in setting up generation capacity totalling 29375 MW; the capacities have been proposed at 57 locations throughout the country. These proposals are at various stages of consideration by appropriate authorities. In most cases, the parties are still to finalise Power Purchase Agreements (PPAs) with the State Governments / SEBs; PPAs are an essential pre-requisite for firming up financing arrangements for the projects. There is need to expedite processing of these proposals. As shown inTable 4 the actual capacity addition in the power sector in the Ninth Plan period is likely to be 7702 MW which is about 44% of the target of 17588 MW.

Environment and Ecology

41. The Ninth Plan Document attaches high priority to environmental management. Critical from this point of view is the Indian coal which is used for thermal power generation. This coal variety has very high ash content of more than 40% and the ash needs to be disposed of. Promotion of clean coal technology is to be encouraged to minimise air pollution. Another issue -- re-settlement & rehabilitation and conservation of flora and fauna – has posed

major bottlenecks for setting up large hydel power projects. A power project needs clearance from environment and forest angles by Ministry of Environment & Forest (MoEF); that is a statutory requirement before implementing the project. MoEF has issued suitable directions to thermal stations to use beneficiated coal with ash content not exceeding 34% from 1st June, 2001 to curb pollution dangers. The restriction applies to thermal plants located 1000 kms from pithead and those located in urban areas/sensitive areas/critically polluted areas, whatever their distance be from pithead; pithead-thermal plant itself is an exception, though. It looks unlikely that the stipulation would be met by the due date, going by the slow progress in this direction..

Energy Conservation

42. Energy Conservation has an important role to play particularly in reducing demand-supply gap in electricity.. International initiatives to reduce Green House Gas emissions stress the need for energy-efficient options. Studies have brought out the enormous potential there is to improving efficiency in energy production, energy transmission and distribution and end use of energy. On the end-use side, most industrial activities in India consume at least 20% to 50% more energy per unit of output as compared to consumption in the developed world and in some of the dynamically developing countries in Asia. Some energy-intensive Indian industries which were decontrolled such as iron and steel, cement, paper & pulp have reduced the share of energy substantially in their cost of production. A comprehensive legislation on Energy Conservation Bill has been approved by the Central Government and is awaiting enactment by Parliament. The Bill envisages three main provisions targeted at :-

i Fixing minimum energy efficiency standards for equipment and appliances, labeling programme for appliances.

ii Preparation of energy conservation building codes, and

iii A set of initiatives for regulation of norms for processes for designated consumers including appointment of energy managers, conduct of energy audits and preparation of schemes for energy conservation. .

Rural Electrification Programme

43. Out of 5.87 lakh inhabited villages (as per 1991 census), nearly 5.05 lakh villages are electrified up to the end of 31.3.99; this accounts for 86% of average all-India level of village electrification. Similarly, out of a potential of 195 lakhs pumpsets in the country, 122 lakhs pumpsets have been energised till March, 1999. The progress of village electrification against the set targets during the first three years and the likely total achievement at the end of the Ninth Plan are is given in Table 9 below:-

TA BLE - 9

Progress of Village Electrification during Ninth Plan

Year	Target	Achievement	% Achievement
1997-98	3,000	3,207	105
		(3,045)	(102)
1998-99	2,000	2,780	138
		(2,615)	(131)
1999-2000	2,000	1,486	74.3
	(provisional)	(Likely)	
9th Plan	30,000	13,000	43.3
		(Likely)	

(The figures in the brackets indicate the REC's achievement out of the total targets)

44. A performance review for three years of the Plan shows slow progress in village electrification in States of Arunachal Pradesh, Assam, Bihar, Meghalaya and West Bengal. The reasons for this range from the difficult locations of villages that remain unelectrified to the difficult financial position of SEBs/Electricity Departments of those States and their reluctance to take up what they consider to be an unremunerative programme. These SEBs are in heavy default in payment of dues to Rural Electrification Corporation (REC) and have failed to furnish a satisfactory repayment schedule.

45. Of about 80,000 villages to be electrified, around 18,000 are in remote and difficult areas which need to be covered through decentralised non-conventional energy sources like solar, small hydro and biomass power.

46. A component of rural electrification project Minimum Needs Programme (MNP) will be implemented directly by State Governments through respective State Electricity Boards from 2000-01 onwards. This decision by the Centre would help in effectively implementing electrification scheme in the remaining villages, most of them in the MNP States.

47. Pumpset Energisation, another major component of Rural Electrification Programme, has the following target/ achievement during the Plan period (Table 10):

Table - 10
Progress of Pumpset Energisation during 9th Plan

Year	Target	Achievement	% Achievement
1997-98	2,40,000	2,84,064	108
		(2,42,173)	(101)
1998-99	2,50,000	3,62,244	138
		(2,81,831)	(113)
1999-2000	2,50,000	1,94,501	77.8
	(Provisional)	(Likely)	

(The figures in the brackets indicate the REC's achievement out of the total targets)

Mid-Term Approach for Power Sector

48. Some of the important issues emerging from the Mid-term Appraisal of the Power Sector are given below:-

(i) The dismal financial position of the SEBs amounts to a crisis situation. Unless urgent steps are taken to restore financial viability it will neither be possible to achieve public investment targets or attract private investment in this sector.

(ii) Although a few States like Orissa, Haryana and Andhra Pradesh have initiated the reform process through unbundling of SEBs, the progress in other States has been very slow. Even in the States where reforms have commenced, implementation of tariff increases is proving to be difficult. The reform process needs to be expedited so that this could be completed by the end of Ninth Plan.

(iii) The success of reforms and the overall higher efficiency in the power sector -- such as higher PLF, reduction in T&D losses as well as fuel consumption and improvement in revenue realisation -- would depend on appropriate management capability which needs to be strengthened through training of the managerial staff and better managerial procedures.

(iv) The present level of T&D losses is a matter of serious concern. It is well known that the officially reported level of losses is an under-estimate. More careful computation of actual losses in the context of unbundling of SEBs has shown a much higher level of losses of up to 40%. Much of this is theft with the connivance of distribution staff. There is a need to focus further reforms in the Distribution Sector and form a number of composite distribution zones in each State as separate entities. Privatisation of distribution will help introduce new efficiency benchmarks. In fact reforms in Distribution Sector are critical to the success of reforms in generation and transmission and are directly linked to consumer satisfaction and return on investments in generation and transmission as well as distribution.

(v) Captive power generation has an important role to play in an environment where there is an overall shortage. However, the present policy regarding captive generation is not very clear. Policy guidelines have been issued by the Ministry of Power for the sale of excess power by captive stations to the Grid on payment of wheeling charges and third party sales. However, most State Governments are yet to formulate clear and transparent policy for purchase of captive power in a manner which would provide fair return to captive/cogeneration power plant owners. There is a need to have appropriate policies and institutional arrangements by which power generated by such captive plants could be optimally utilised.

(vi) The tax concessions as are available to generating entities should also be extended to transmission and distribution entities; otherwise States will be discouraged from initiating reforms.

(vii) Pumped storage schemes, though costly, provide a means for obtaining additional peaking power leading to better management of the system. Certain

financial incentives would facilitate development of such schemes. There is need to initiate advance action during remaining period of the Ninth Plan.

(viii) Investment in R&M has distinct cost advantage over new generation capacity. Efforts need to be made to expedite R&M works and life-extension programme.

(ix) In order to expedite the Rural Electrification Programme, participation by the local bodies like village panchayats, village co-operatives, Non Governmental Organisations (NGOs) and other people's organisations needs to be encouraged.

(x) A Task Force may be set up to analyse/examine issues related to the performance of power sector during Ninth Plan and suggest advance action for the Tenth Plan.

(xi) Under the mega power policy, if a particular SEB defaults in making payment to the PTC, recourse will be taken to make deduction from the State share of Central Plan Assistance (CPA) and other devolution for making payment to the PTC. However, certain implications such as impact of adjusting those dues on priority schemes under the social sector need to be resolved.

(xii) As per the present definition, a village will be deemed `` electrified'' if electricity is used in an inhabited locality within the revenue boundary of the village for any purpose whatsoever. Some other criteria may be applied for this purpose, it is suggested, like a minimum percentage of households being electrified and generation of gainful economic activities in the area.

(xiii) Involvement of local bodies like village panchayats, village co-operatives, NGOs and other people's organisations would go a long way in effectively implementing Rural Electrification Programme and industrialisation and allied activities in rural areas.

(xiv) Pursuant to the 73rd Amendment of the Constitution, the Panchayats would be entrusted with the responsibility for programmes like rural electrification and promotion of non-conventional energy. Rural electrification would, however, require technical expertise for installation, operation and maintenance which is not always available with the Panchayats. With some training, the Panchayats can be a very effective institution in making rural electrification a success.

Coal & Lignite

49. The Ninth Plan envisaged augmenting domestic coal production with a long-term perspective keeping in view a sharply increasing demand by the power sector vis-a-vis long-gestation periods of coal projects. An important area of the Plan concerns restructuring the coal sector and facilitating private sector participation in commercial coal mining by means of necessary legislative amendments. The Plan continues to lay emphasis on clean coal technologies,

Science & Technology (S&T), development of Coal Bed Methane resources, augmentation of port and rail infrastructure facilities for improved coal movement and development of lignite resources in a big way.

Mid-Term Review

50 Table- 11 and 12 (below) show physical and financial performance in respect of coal demand, production and regional/promotional exploration during first two years of the Ninth Plan and target for the year 1999-2000 and the terminal year of the Plan.

Table - 11 - Physical Performance

Sl. No	Parameter	Ninth Plan Target 2001-02	1997-98 Actual	1998-99 Provl.	1999-2000 Target	Revised Target 2001-02	Growth Rate (%) Ninth Plan Original	Revised
1.	Coal Demand (mt)	412.20 (7.70)	306.41 (5.80)	291.11 (3.01)	311.83 (3.00)	370.80 (7.70)	6.85	4.6
2.	Coal Production (mt)	370.60	295.80	292.16	301.80	328.86	5.34	2.86
3.	Lignite Production (mt)							
	Central - Neyveli (NLC)	22.00	18.11	18.17	17.50	22.00	4.9	4.9
	State - Gujarat, GMDC	10.00	4.94	4.90	NA			
	Rajasthan	13.00	0.18	0.25	NA			
	Total Lignite:	45.00	23.05	23.07	17.50			
4.	Promotional .Expl.(m)	775000	96118	146800	190000	720000		

Table – 12 - Financial performance

(Rs.crore)

Sl. No	Head	Ninth Plan Approved Outlay 1997-02	1997-98 Actual	1998-99 Provl.	1999-2000 RE	Cumulative 1997-2000	Balance (+/-)	Revised Outlay Ninth Plan 1997-2002
(i)	Coal & Lignite	17575.23	2212.67	2469.52	3605.85	8288.04	9287.19	17430.74
(ii)	NLC (Power)	1866.36	37.00	123.94	296.64	457.58	1408.78	1713.00
	Total MOC:	19441.59	2249.67	2593.46	3902.49	8745.62	10695.97	19143.74*

Note: * the revised Ninth Plan Outlay includes Rs.459.19 crore for implementing VRS in CIL.

Coal Demand

51 Coal consumption in first two years of the Plan registered a negative growth of 0.8% against the proposed average annual compounded growth of 6.85%. Main reasons for shortfall have been sluggishness in the industrial sector, slippage in materialisation of new coal-based thermal power stations, lesser coal offtake by the power sector due to resource constraints and consequently consumption from their coal stocks by SEB's and non-compliance with the norm of 30 days consumption level. Also, there have been a lower offtake by steel sector due to slump in demand and by cement sector because of duty-free imports of coal against cement exports, some imports by the consumers including the cement sector in the coastal areas, coal movement constraints and unaccounted

flow of certain quantity of cheaper coal through private sector producers/suppliers. A downward revision of sectoral targets for major coal consumers like Power and Steel has necessitated revision of the Plan target of coal demand, which is now fixed at 370.80 mt excluding 7.7 mt of washery middlings in the terminal year 2001-02 implying an average annual compounded growth of 4.6%. Sectoral details are given in Table-13 below.

Table - 13 - Sectorwise coal demand/offtake

(in million tonnes)

Sl.No.	Sector	1997-98 Actual	1998-99 Provl.	1999-2000 Target	IX Plan Demand	
					Original 2001-02	Revised 2001-02
	Coking Coal					
1	Steel !	33.06	33.24	36.02	49.60	44.60
2	Coke Ovens !			0.81	2.00	2.00
	Sub-Total Coking:	33.06	33.24	36.83	51.60	46.60
	Non-Coking					
3	Power Utilities	212.92	202.51	214.00	262.00	235.00
		(3.62)	(3.01)	(3.00)	(5.00)	(5.00)
4	Cement	10.13	8.66	10.00	21.40	21.40
5	Steel DR	2.62 !		3.58	6.10	4.20
6	Railways	0.05 !		-	-	-
7	Fertiliser	4.64		4.30	3.80	3.80
8	LTC/Soft Coke	0.04 !		0.04	3.00	3.00
9	Export	0.06 !		0.07	1.00	1.00
10	Captive Power	16.19 !	46.70	16.42	25.80	25.80
		(1.58) !		(-)	(2.70)	(2.70)
11	BRK & Others	23.64 !		23.34	33.50	26.00
		(0.60) !		(-)	(-)	(-)
12	Colly. Consumpt.	3.06 !		3.25	4.00	4.00
	Sub-Total NonCoking:	273.35	257.87	275.00	360.60	324.20
		(5.80)	(3.01)	(3.00)	(7.70)	(7.70)
	Grand Total:	306.41	291.11	311.83	412.20	370.80
		(5.80)	(3.01)	(3.00)	(7.70)	(7.70)

Note: Figures in brackets are washery middlings and are not included in totals.

Coal Production

52 Coal production in first two years of the Plan suffered due to a slump in offtake necessitating coal companies to regulate output to avoid piling of pithead stocks. The production has grown at a rate of 0.78% against the envisaged growth of 5.3%. The slump in demand necessitated downward revision of the targeted coal production in the terminal year (2001-02) of the Plan from 370.60 mt projected earlier to 328.86 mt. This implies an average annual compounded growth of 2.86% against the initially envisaged growth of 5.3%. The company-wise production details are given in Table-14, below.

Table – 14 Coal Production (million tonnes)

Sl. No	Company	IX Plan Target 2001-02	1997-98 Actual	1998-99 Provl.	1999-2000 Target	IX Plan Rev. Target 2001-02	IX Plan Growth (%) Original	Revised
1.	Coal India Ltd. (CIL)	314.00	260.55	256.49	262.00	285.00	4.60	2.60
2.	Singareni Coll. Co. Ltd.	36.00	28.94	27.33	31.00	34.00	4.61	3.43
3.	TISCO/IISCO/DVC	7.60	6.31	6.34	6.80	7.60	3.89	3.89
4.	CAPTIVE BLOCKS	13.00	-	2.00	2.00	2.26	-	-
	TOTAL:	370.60	295.80	292.16	301.80	328.86	5.34	2.86

53. The incremental coal production envisaged in the Plan was 84.94 mt over 56.37 mt achieved in the Eighth Plan. Out of this 60.04 mt of production was to come from new projects (Coal India Ltd, CIL, 55.71 mt; Singareni Coal Co. Ltd, SCCL, 4.33 mt) and 13 mt from new captive blocks. As against this, the new projects sanctioned by CIL and SCCL have a capacity of 13.33 mt only; and only one captive block has started producition, of about 2 mt. The main reasons for shortfall have been disturbed industrial relations in SCCL in 1997-98 and regulation of coal production by the coal companies following lower offtake by power, steel and cement sectors in 1998-99 in order to avoid accretion to pit-head stocks.

54 Further, the availability of **washed coking coal** from CIL sources is declining mainly due to deteriorating raw coal feed, which is adversely affecting the performance of coking coal washeries. The average yield of the washeries has come down to around 44%. The actual production of washed coking coal from CIL sources in 1997-98 and 1998-99 was 6.99 mt and 7.81 mt against the target of 11.36 mt and 9.96 mt respectively. The target of production for 1999-2000 is 8.04 mt. The revised washed coal production target for CIL in 2001-02 is 8.45 mt as against the original target of 12.26 mt.

Lignite

55 The envisaged demand for lignite in the terminal year of the Ninth Plan is 54.44 mt. The production from Neyveli Lignite Corporation (NLC) in first two years of the Plan has exceeded the targets by about 4%. The Ninth Plan target of 22 mt for NLC is likely to be achieved.

Demand- Supply Management

56 The gap between the original targets of coal demand and production was 41.6 mt in 2001-02. This was to be met through import of 19 mt of coking coal and 2.3 mt of non-coking coal and the balance 20.3 mt was to be met through augmentation of domestic coal production by CIL. As against this, the now envisaged gap in the revised demand and production estimates in 2001-02 is 41.94 mt. Of this, the import requirement of coking coal would be 14.5 mt which would still leave a gap of 27.44 mt. Any additional requirement during the Ninth Plan would be met by increasing the domestic production or drawing from the pithead stocks of CIL. However, it would affect the domestic coal supply in the Tenth Plan period and beyond unless additional production capacities are created.

Coal Sector Growth at a glance

- Coal consumption and production suffered in first two years of the Plan necessitating downward revision of Ninth Plan targets. This was mainly due to slower than expected economic growth and non-materialisation of envisaged new coal based thermal power generating capacity.
- According to the revised demand and production targets, the net gap in the terminal year of the Plan would be 41.94 mt of which the import requirement of coking coal is 14.5 mt leaving a gap of 27.44 mt of non coking coal. This gap can be met by increasing production beyond the Ninth Plan target or drawing from pithead stocks of CIL.
- Initially it was envisaged that 60.04 mt of production would come from new projects of national coal companies (CIL-55.71 mt; SCCL- 4.33 mt) and 13 mt from new captive blocks awarded. As against this, in first two years of the plan new projects for a capacity of 13.33 mt only (CIL- 12.85 mt; SCCL- 0.48 mt) have been sanctioned and only one captive block has started producing 2 mt. This rate of capacity addition will lead to a large gap between demand and supply for coal in the Tenth Plan and beyond. Unless projects in the pipeline are implemented, this gap cannot be reduced.

Coal Exploration

57 The anticipated achievement of promotional drilling in first three years of the Plan is 4,32,9178 metres. This leaves a balance drilling of 2.87 lakh metres for the remaining two years.

58 The Ninth Plan envisaged 18.8 lakh metres of detailed drilling in coal and 3.85 lakh metres in lignite with an objective to upgrade 24 billion tonnes of coal reserves and 5.9 billion tonnes of lignite to 'proved' category. The achievement in 1997-98 and 1998-99 had been 3,35,936 metres and 3,24,000 metres respectively. The target for 1999-2000 is 3,46,000 metres. The anticipated achievement in first three years of the Plan is 10,05,936 metres. If this trend continues, there will be a shortfall of about 1.3 lakh metres at the end of the Plan. Therefore, concerted efforts are required to step up drilling operations so as to achieve the Plan target of detailed exploration. An outlay of Rs.91.18 crore has been provided for undertaking detailed exploratory drilling of 3.64 lakh metres in 41 non-CIL blocks in 13 coalfields outside CIL's command area during the Ninth Plan. However, in view of the resource constraints, the possibilities for joint ventures would need to be explored between public sector undertakings and private partners to undertake detailed drilling outside CIL blocks.

Project Implementation

59 Ninth Plan targeted a coal production of 350 mt from the public sector coal companies, out of which 60.04 mt was to come from new projects (CIL-55.71 mt; SCCL- 4.33mt) and the balance from existing mines and ongoing projects. As against this, in first two years of the Plan, only a capacity of 13.33 mt in new projects has been sanctioned in CIL and SCCL. Only one captive block began producing 2 mt against a target of 13 mt. As against this, the revised capacity addition target in the Plan is only around 50 mt. This rate of capacity addition would affect coal availability in the Tenth Plan period and beyond. Besides, the delays continue resulting in both time and cost overrun. Problems of land acquisition, forestry clearance, rehabilitation, equipment supply, funds constraints, inadequate geological studies etc. continue to cause delays in the

implementation of the coal projects. It is, therefore, necessary that effective steps are taken to eliminate/minimise the time and cost overruns in implementation of mining projects. Prioritisation of potential projects and weeding out of unviable and languishing projects would be necessary.

Coal Imports

60 Coal is on OGL (Open General Licence for imports). Steel sector has been importing coking coal on qualitative and quantitative considerations. The basic import duty on coking coal is 5% and on no-coking coal 15%. In recent past, imports of non-coking coal have been stepped up mainly by consumers in coastal regions particularly cement and some thermal stations. This is because of the cheaper imports compared to a high landed cost for domestic coal on account of high rail freight charges.

Infrastructure for Coal Movement

61 With a view to augmenting rail movement capacity, it was proposed to take up certain critical rail links in potential coalfields viz. Korba, Talcher, Ib and North Karanpura. Ministry of Railways has taken up these works in some of the areas.

62 Coal handling capacity at ports – which stood at about 8.5 mt at end of the Eighth Plan – is proposed to be raised to 37 mt by the Ninth Plan end. This includes capacity addition of 20 mt at Paradip and 8 mt at Chennai. This capacity addition is likely to be achieved.

Beneficiation of Non-Coking Coal and Clean Coal Technologies (CCT)

63 Ministry of Environment & Forests (MOEF) has made it mandatory to utilise coal with not more than 34% ash content in power stations from 1.6.2001 onwards. However, compliance of this requirement may not be feasible within the prescribed time period as there is no matching coal washing capacities. Besides, blending of domestic coal with imported coal may not be feasible since enormous quantities of coal would need to be imported with both physical and financial implications. This needs to be reviewed by MOEF/Ministry of Coal (MOC).

64 Coal Bed Methane exploration and exploitation is a thrust area of the Ninth Plan under Clean Coal Technologies (CCT). The work is being coordinated between Ministry of Coal (MOC) and Ministry of Petroleum & Natural Gas. Similarly, power generation through Integrated Gas Combined Cycle (IGCC) and Fluidised Bed Combustion (FBC) is also a thrust area under CCT for the Ninth Plan. This needs to be given some fillip by Ministry of Power.

Environmental Measures

65 Mitigation of problems of mine fires and land subsidence in Jharia and Raniganj coalfields continues to be an important thrust area in the Ninth Plan. Under a Master Plan, MOC has formulated a scheme "Rehabilitation, Control of Fire & Subsidence in Jharia & Raniganj Coalfields". This scheme is based on recommendations of a High Level Committee and it is is being implemented in phases.

Science & Technology

66 Although the Plan has laid a special thrust on Research & Development (R&D)/Science & Technology (S&T) activities in the coal sector, the progress has not been as desired. As a result, the outlays have not been fully utilised. One important project, namely, coal bed methane extraction in collaboration with United Nations Development Programme (UNDP) and Global Environment Fund (GEF) is proposed to be taken up in the Plan.

Outlays

67 The expenditure in the first two years has been only 25% of the Ninth Plan approved outlay and including the Revised Estimates (RE) for 1999-2000 the cumulative expenditure is 45% (Table-15). This would leave a balance amount of Rs.10,695.97 crore (55%) available for the remaining period of the Plan. In view of the lower offtake of coal by consuming sectors during the first two years and the current year of the Plan, the Ninth Plan outlay of Ministry of Coal has been revised from Rs.19,441.59 crore to Rs.19,143.74 crore which includes an outlay of Rs.459.19 crore to implement a Voluntary Retirement Scheme (VRS) in CIL.

Table - 15 - Outlay & Expenditure

(Rs. Crores)

Sl. No.	PSU	IX Plan Outlay 1997-02	1997-98 Actual	1998-99 Provnl.	1999-2000 BE	1999-2000 RE	Cumul. 1997-2000	Balance (+/-)	Revised Outlay 1997-2002
1	CIL	12401.00	1824.55	1753.73	2556.00	2676.19	6306.91	6094.09	12000.00
2	SCCL	2235.00	208.48	200.49	227.19	217.20	626.17	1608.83	1665.32
3	NLC (Mines)	2581.80	149.34	470.50	575.98	561.30	1195.82	1385.98	2857.00
4	S&T	80.00	8.50	5.00	20.71	7.57	34.21	45.79	80.00
5	Regl.Expl.	130.00	20.95	24.58	32.56	32.56	78.09	51.91	140.00
6	EMSC	79.00	0.85	10.00	20.00	11.63	30.85	48.15	79.00
7	Det.Drilling (Non-CIL)	9.38	0.00	4.00	5.38	5.38	9.38	0.00	91.18
8	Reg.Fr. Work	8.05	0.00	1.22	3.89	6.00	5.11	2.94	8.05
9	Rehab.Proj. Jharia/Rangnj.	50.00	0.00	0.00	0.00	0.00	1.50	48.50	50.00
10	R&D Centre	1.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00
12	VRS	400.00*	75.33*	151.03*	160.00*	165.00*	391.36*		459.19**
	Coal&Lignite	17575.23	2212.67	2469.52	3441.71	3522.83	8288.04	9287.19	17430.74
13	NLC (Power)	1866.36	37.00	123.94	296.64	260.56	457.58	1408.78	1713.00
	Total MOC:	19441.59	2249.67	2593.46	3738.35	3783.39	8745.62	10695.97	19143.74

Note:- * Outlay for VRS of Rs.400 crore is from NRF initially & not included in totals. In 1999-2000 (RE), out of Rs.165 crore, Rs.5 crore is from DBS & added in total.

**Revised Ninth Plan Outlay for VRS at Rs.459.19 crore is from DBS available to DOC in the IX Plan and added to the totals of revised outlay.

Externally Aided Projects (EAP)

68 Various coal projects under CIL, SCCL and NLC and Regulatory Framework Review Project had an external aid component of Rs.349.66 crore in the Ninth Plan.. The actual expenditure in 1997-98 was Rs.51.27 crore while the anticipated expenditure in 1998-99 was Rs.75.74 crore. An outlay of Rs.112.56 crore has been provided in the Budget Estimates (BE) for 1999-2000. The cumulative anticipated expenditure in the first three years is 68.5%. The balance available for the remaining two years of the plan is Rs.110.09 crore (31.5%).

69 A loan assistance of US $ 1060 million has been obtained by CIL from the World Bank (WB) for implementation of "Coal Sector Rehabilitation Project (CSRP)" to expand coal production from 24 identified projects in five of its subsidiary companies. They comprise some expansion schemes and replacement of heavy earth moving equipment. This amount, in turn, consists of US $ 530 million from the WB and a similar amount from Japan Export Import (JEXIM) bank. CIL will contribute US $ 581.6 million. The total investment envisaged is US $ 1697.6 million in the Ninth Plan. The loan amount will be a direct component. The utilisation of funds commenced in 1998-99, and against the BE provision of Rs.676.63 crore, the RE has been Rs.455.35 crore.

Coal Sector Reforms

70. With deregulation of prices of remaining grades of coal with effect from 1.1.2000, the prices of all grades of coal stand decontrolled. At present private sector participation in coal mining is limited to mines for captive consumption only. A Bill to amend the Coal Mines (Nationalisation) Act, 1973 to permit non captive mining has been introduced in Parliament. It is necessary to expedite passage of this legislature to open up the sector for private investment. There is need to expedite setting up of regulatory authority for resolving any price disputes and allocation of coal blocks both for exploration and exploitation by framing separate rules under Mines and Minerals Development & Regulations (MMDR) Act, 1957 for grant of prospecting license/mining lease etc.

Reforms in the Coal Sector

- The Bill to amend Coal Mines (Nationalisation) Act, 1973, for allowing private sector in commercial coal mining needs to be expedited. Private coal mining for commercial supply is essential to supplement the efforts of national coal companies in making available required quantity of coal from domestic sources.
- Setting up of Regulatory Authority for resolving any price disputes etc., allocation of coal blocks both for exploration and exploitation by framing separate rules under MMDR Act, for grant of prospecting license/mining lease etc. needs to be expedited.

Problem Areas

The following are some of the problem areas which need to be addressed.

(a) **Rail freights** - Coal is being overcharged and made uncompetitive vis-a-vis imported coal**.** This is because of cross subsidy by Railways.

(b) **Productivity & capacity utilisation** – The Ninth Plan target for productivity in terms of output per man shift was set at 2.24 tonnes for CIL (OC -6.53 t; UG –0.69 t). The anticipated achievement in 1998-99 has been 1.95 tonnes (OC –5.29 t; UG –0.6 t). Similarly, for SCCL the target set was 1.3 tonnes (OC –4.50 t; UG –0.79 t). The anticipated achievement in 1998-99 was 1.36 tonnes (OC-3.58 t; UG –0.79 t). There is a need for improving the overall productivity in general and underground productivity in particular. For the productivity of Heavy Earth Moving Machinery (HEMM), MOC has formed a Committee to review the norms. The Committee is expected to submit its report shortly. There is also a need to improve the overall system capacity utilisation.

(c) **Cost control** - The price of indigenous coal is becoming uncompetitive due to higher cost of production, high State levies and high rail freight charges. It is reported that about 19% of the unit cost of production in CIL goes towards administrative and other factors. This indicates there is significant scope to reduce this type of expenditure in order to bring down unit cost of production and pass the benefits to consumers.

Mid-Term Approach for Coal Sector

71 Coal being a plentiful indigenous energy source it is necessary to ensure effective exploitation of our resources. There is a dire necessity for improvement of efficiency of operations in the sector with a professional, managerial approach. Over the past three years, though there has been a decline in the international prices of coal by over 30%, the price of indigenous coal has increased by over 25%. This brings in the necessity of looking into management deficiencies in order to make the domestic coal competitive in the market. There is pressing need for development of coal sector in a sustained manner as part of a long-term energy strategy. Concerted efforts would need to be made towards improvement in quality, technology, productivity, capacity utilisation etc. with proper managerial inputs. Besides, reforms would need be expedited to facilitate private sector investment which would generate competition in the sector.

72 Some important issues emerging from the Mid-Term Appraisal of the Coal & Lignite Sector are:

(i) Domestic coal demand and production have suffered in first two years of the Ninth Plan affecting generation of internal resources, mainly due to shortfall in the offtake by the major consuming sectors like power, cement, etc. New coal based generation capacity addition has also not materialised as envisaged. Efforts need to be made to stimulate the demand with proper marketing strategies both domestic as well as export markets so that available production capacities are fully utilised. It should be ensured that the present trend of the National Coal Companies (NCCs)

regulating coal production due to temporary sluggishness in offtake should not create a crisis when demand for coal picks up, especially in power sector when private power projects in the pipeline materialise.

(ii) Taking up of new projects is getting delayed for various reasons and this may result in shortfall in availability of coal in medium and long term. The gestation period for a coal mine is considerably long vis-a-vis power plants and this underscores the need for taking up development of Plan-identified projects to meet the requirements of power sector during the early Tenth Plan period.

(iii) There is an urgent need to upgrade proven coal reserves through detailed drilling especially in the coal bearing blocks outside CIL command area. While budgetary support for such detailed drilling would be necessary for the time being, the feasibility of joint ventures between public sector undertakings and private sector need to be explored.

(iv) The constraints of project implementation viz. land acquisition, rehabilitation, forestry & environmental clearances, resources, etc. are adversely affecting the progress of implementation of projects and need to be improved. There is an urgent need to finalise the National Rehabilitation Policy and the single-window system for environmental & forestry clearances to projects.

(v) Appropriate mechanism would need to be evolved for the recovery of the outstanding coal sale dues and power sale dues for improving financial health of the coal sector PSUs.

(vi) Revival of Eastern Coal Field Ltd.(ECL), Bharat Coking Coal Ltd.(BCCL) & Central Coal Field Ltd. (CCL) should be addressed urgently so as to improve their financial health. Rationalisation of manpower in coal companies in general and in loss-making companies in particular should also be attended to urgently. Among others, VRS could be one of the options in this regard.

(vii) Construction of critical rail links in potential coalfields would need to be expedited. Also, the feasibility of coal slurry transportation would need examination.

(viii) Efficient utilisation of high ash Indian coals calls for adoption of clean coal technologies, fluidised bed combustion/pressurised fluidised bed combustion boilers for power generation with proper tie-ups with manufacturers by coal and power sectors.

(ix) Rail freight rates for coal movement would need to be rationalised.

(x) Legislative action needs to be expedited to facilitate private sector investments in coal sector as also to permit free sale of domestic coal.

(xi) Sources of funds for financing should be identified, finalised and tied up before sanctioning projects to avoid time and cost overruns in implementation.

(xii) There is need to institutionalise closer and regular monitoring of implementation of coal mining projects by coal companies as well as by an Inter-Ministerial Monitoring Group under MOC with a representative of the consuming Ministries and the Planning Commission.

(xiii) Proper demand management measures by consuming sectors particularly power and steel in reducing specific coal consumption levels would conserve scarce resources and help in making proper demand estimates.

Petroleum & Natural Gas Sector:

73. In view of the increasing demand of petroleum products and stagnant indigenous production of crude oil, the following areas were identified for special attention during Ninth plan:

- Acceleration of exploration efforts, especially in deep offshore areas
- Pursuing the possibility of acquisition acreage abroad for equity oil
- Special attention on improving reservoir management
- Formulation of an overseas oil and gas supply policy
- Deregulation/rationalisation of the Administered Pricing Mechanism (APM)
- Possibility of importing natural gas in the form of liquefied natural gas (LNG)
- Creation of adequate refining capacity (80%-90% of demand)
- Augmentation and upgradation of marketing and distribution facilities
- Improvement of product quality
- Removal of existing administrative bottlenecks
- Setting up of regulatory mechanism
- Setting up of strategic tankages for ensuring supplies

Mid-Term Review

74. Physical and financial performance during first two years of the Ninth Plan, what is anticipated for 1999-2000 and the likely Plan achievements are given in the table 16 below. It is evident that accretion to reserves has been significant below target whereas expansion in refining capacity exceeds target. In financial terms investment is likely to be only about 81% of the target.

Physical performance

Table - 16

Programmes	1996-97 Actual	2001-02 Target	Ninth Plan Target	1997-98 Actual	1998-99 Actual	1999-2000 Antic.	Anticipated achievement during 1997-2000	Likely Achievement 1997-02	% of Target
Demand/ consumption (MMT)	79.16	104.80	469.83 $	84.29	90.86	96.44	271.59	484.59	--
Reserve accretion (MMTOE)	27.06	--	246-343	22.69	33.14	43.80	99.63	195.63	79.5 *
Crude oil (MMT)	32.90	36.98	180.82	33.86	32.71	31.97	98.54	161.93 @	89.55
Gas production (BCM)	23.30	30.70	144.53	26.40	27.43	27.97	81.80	140.35	97.1
Refining Capacity(MMT)	61.55	113.95	113.95	61.55	68.45	103.15	112.54	129.04	113

$ Excludes liquid fuel for power generation
@ Considering projected production 31.99MMT & 31.40 MMT during 2000-01 & 2001-02 respectively.
# considering projected production of 28.81 BCM & 29.75 BCM during 2000-01 & 2001-02 respectively.
* at minimum level of 246MMTOE.

Outlays / Expenditure (Rs. Crore)

Table - 17

1996-97 Actual	**Ninth Plan** Approved Outlay	1997-98 Actual	1998-99 Actual	1999-2000 RE	Anticipated expenditure during 1997-2000	Likely Investment 1997-02	% of utilisation
8007.59	74014.18	9682.72	11213.62	12218.29	33114.63	60114.63	81.2
	(74014.18)	(9165.77)	(9938.50)	(10215.96)	(29320.23)	(56320.23)	(76)

* Considering the avg. expenditure of Rs. 13500 crore during remaining two years.
Figures in bracket are at constant prices of 1996-97

A perusal of the above Table reveals the following:

Demand/Consumption of Petroleum Products

75. The demand of petroleum products was estimated at 104.80 million metric tonnes (MMT) during 2001-02 excluding liquid fuel requirement for power generation. If this growth trend (6.8%) as achieved in the last three years continues, the consumption of petroleum products would be about 110 million tonnes during the year 2001-02, including liquid fuel requirement for power generation.

Exploration and Development

76. In order to boost domestic production of crude oil, the Ninth Plan has emphasised a change in exploration strategy, which includes (i) extensive exploration in all the basins, (ii) use of 3D technology for seismic survey; and (iii) exploration in deep waters in North Brahamputra and frontier areas.

77. The policy of exploration and exploitation of Coal Bed Methane (CBM) was approved by Government in July, 1997. The policy envisages (i) global bidding system, (ii) award of blocks to PSUs on nomination basis and (iii) joint exploration of CBM by Oil & Natural Gas Corporation Ltd. (ONGCL) and Gas Authority of India (GAIL).

78. ONGC Videsh Ltd. (OVL) is pursuing opportunities to acquire equity oil and gas abroad. Other national oil companies, such as Oil India Ltd (OIL), Indian Oil Corporation (IOC) and Hindustan Petroleum Corporation Ltd (HPCL, are also exploring possibilities of joint ventures in exploration and production of oil abroad.

Performance Highlights

Oil & Natural Gas Sector

- **Petroleum products demand target is likely to be met.**
- **Crude oil production may fall short of the target by about 10%.**
- **Natural gas production may marginally fall short of the target.**
- **Accretion to hydrocarbon reserves is significantly below targets.**
- **Refining capacity target is likely to be over achieved.**
- **Imports of oil may surpass the target of 85-90 million tonnes in 2001-02.**
- **Dismantling of APM and duty rationalisation slower than envisaged.**
- **Private participation in exploration and production is below expectation.**
- **Ninth Plan expenditure may be lower than the approved outlay.**

Hydrocarbon Reserves Accretion

79. The Ninth Plan targets for recoverable reserves accretion is between 246 million tonnes and 343 million tonnes of oil and oil equivalent of gas (MMTOE) for ONGC and OIL but the target is not likely to be achieved. The anticipated addition is only 99.63 MMTOE during first three years of the Plan**.** Exploration programme of National Oil Companies (NOCs) was recast in August 1998 to achieve a enhanced Reserve Replacement Ratio (RRR) of more than or equal to unity. The recast plan is under implementation for three years of the plan i.e. 1999-2000 to 2001-02. However, no appreciable change in the reserve accretion scenario is likely to take place unless any significant discovery is made. As per the latest estimates, the reserve accretion is likely to be of the order of 195 MMTOE for the Plan.

80. The anticipated crude oil and natural gas production is likely to be short of target for the first three years and the Plan target as well.

Refining Capacity

81. The refining capacity was targeted to increase from 61.55 MMT (re-assessed at 62.24 MMT with Manglore Refinery and Petro-chemicals Limited (MRPL) scaling up its capacity from 3.00 MMT to 3.69 MMT) in 1997-98 to 113.95 MMT by terminal year of the Ninth Plan. As per the present estimates, the refining capacity may go up to 129.04 MMT by the end of the Plan, which includes 43.5 million tonnes capacity addition in private sector, 17.30 million tonnes in the public sector and 6.00 million tonnes in joint sector. With the materialisation of the projected refining capacity, the demand is expected to be met essentially from the domestic production. Imports / Exports of petroleum products will be there only to the extent of imbalance between the availability and demand. Further, imports of permitted products are expected to be made by private parties for marketing or own use.

Imports of Crude Oil and Petroleum Products

82. During 1998-99, 39.81 MMT of crude oil and 18.09 MMT of petroleum products were imported. It is estimated that 63.94 MMT of crude oil and 10.36 MMT of petroleum products would be imported during 1999-2000. In addition, 5.70 MMT of petroleum product would be imported by private sector. The import requirement of crude oil during 2001-02 would be in the range of 85 MMT to 90 MMT.

Price Reforms

83. **Deregulation**: As per approved programme on dismantling of APM, the consumer prices of all petroleum products, except MS, HSD (High Speed Diesel), ATF, Kerosene Oil for Public Distribution System (PDS) and Liquefied Petroleum Gas LPG (domestic) have been decontrolled. Further, the ex-storage price of HSD has also been linked to import price. However, subsidies for LPG and Kerosene were to be reduced in a phased manner and this has not been done. The policy of linking diesel prices with world prices has also not been implemented regularly as was envisaged. This has created uncertainty about policy in the area.

84. **Restructuring**: The Group on Hydrocarbon Vision-2025 has recommended that Oil PSUs may be restructured to have required strength to compete with multinational corporations (MNCs) and private sector. There is a need, however, for Government presence through PSUs in both upstream and downstream sectors at least for a period of five years after complete deregulation.

Environmental Management

85. Supply of MS with low lead content (0.15 gm/litre) was introduced throughout country from January 1997; effective 1.2.2000 only unleaded MS is being sold. As envisaged, diesel with 0.25% sulphur was to be supplied by April 1, 1999. For this purpose hydro-desulphurisation facilities were planned in nine refineries, most of these have already been commissioned. Diesel with 0.25% sulphur is being supplied throughout the country since 1.1.2000.

Petroleum Conservation

86. In view of the widening gap between demand and indigenous availability, high priority needs to be accorded to petroleum conservation. Efforts to promote conservation have been made by the Petroleum Conservation Research Association (PCRA), Refineries, Upstream oil Sector, Oil marketing companies, networking institutions like NPC, CII, FICCI, Institution of engineers, NGOs and similar organisations in the states and individual consumers. There have been mass awareness campaigns. Efforts by the Ministry of Non- Conventional Energy Sources (MNES) and organisations under them also result in conservation of energy including petroleum. Similarly, thanks to Government incentives and the process of liberalization, there have been efforts by industrialists and entrepreneurs to upgrade technology leading to conservation of petroleum. Technologies in the transport sector, which is the largest consumer of petroleum products, are being upgraded. However, it seems difficult to quantify the extent of saving of petroleum products as a result of all these various conservation measures. There is a need to evolve a mechanism to assess such benefits from conservation and from pollution reduction efforts as also to benchmark the various activities with the international practices so as to reduce energy consumption in producing and consuming sectors.

Plan Outlays

87. The Petroleum sector outlay for the Ninth Plan is Rs.74,014.18 crore. The anticipated expenditure up to 1999-2000 would be Rs. 33,114.63 crore and up to 2001-02 Rs. 60114.63 crore. The shortfall is expected mainly on account of delay in taking up of the joint venture refinery projects.

Mid-term Approach for Petroleum Sector

88. Some of the important issues that emerged from the mid-term appraisal in Petroleum and Natural Gas sector are:

(1) The addition to hydrocarbon reserves during first two years of the Plan is significantly below the target. The relatively low success rate is a matter of serious concern. There is a need to step up the exploration activity. This could be achieved by increasing the periodicity of offering exploration blocks under the NELP. In addition, it is also important to improve the quality of data available for better interpretation.

(2) Refining sector has been de-licensed and opened up to private investors. Projects to add adequate refining capacity, both through expansion and grassroot addition, have been approved to meet the Plan requirements. However, due to current low international refining margins, some of the joint venture partners in the sector are reluctant to go ahead with setting up of grassroot refineries. With the emergence of large private refineries, the Plan target of refining capacity is expected to be over-achieved. Therefore, some of the grass root refinery projects being processed for approval need to be rescheduled until the demand picks up.

(3) There have been some deviations with regard to rationalisation of duties in the dismantling of Administered Pricing Mechanism for the Petroleum sector. This has created uncertainty about future policy. The dismantling process of APM needs to be followed as envisaged so that prices are deregulated by April 1, 2002, as originally envisaged.

(4) In view of the strategic importance of oil sector in the economy, there is a need to restructure the PSUs to have the required strength to compete with MNCs. Following restructuring these companies should be privatised through a transparent process.

(5) For marketing and distribution of petroleum products, the existing mechanism envisages that these activities be taken up by an oil company if it invests either Rs. 2,000 crore in the domestic refining capacity or create facilities to produce 3 million tonnes of crude oil per annum. Such a dispensation has not been found attractive to potential investors who are interested in marketing as well. With a view to creating competition, it is suggested that investment in marketing and distribution of petroleum products may also be included for meeting the above criteria. The current policy on marketing rights requires a review. Marketing rights for transportation fuel to be made conditional to a company investing Rs.2000 crores in Exploration and production. Refining, Pipelines or Terminals. Such investment should be towards additionality of assests and in the form of equity, equity like instruments or debt with recourse to the company.

(6) The import dependence of oil is increasing and is expected to be about 70% by terminal year of the Ninth Plan. It needs to be viewed whether efforts be made to restrict consumption of petroleum products. Any arbitrary limit of restriction on imports of petroleum products may affect the economic growth of the country. The correct approach would be to allow scarcity to be reflected in prices. This will create an incentive for conservation and efficient use of petroleum products.

(7) Complete price deregulation and operation of efficient market in petroleum sector needs establishment of prudential rules and regulations by a statutory regulatory authority. Therefore, setting up of regulatory mechanisms needs to be expedited, so as to ensure smooth transition from APM to market-driven pricing mechanism.

DRIVERS FOR FUTURE

Oil & Natural Gas Sector

- Exploration activities need to be accelerated - both in NELP and non-NELP areas. The policy of offering exploration blocks under NELP may be continued. The frequency of bidding rounds under NELP needs to be increased.

- The development of new grass root refining capacity needs to be slowed down in view of the emergence of excess capacity.

- The dismantling of APM should be implemented according to the approved schedule so as to have a free market and healthy competition.

- The policy for new entrants to the marketing and distribution of petroleum products needs to be reviewed to encourage new entrants. Marketing rights for transportation fuel to be made conditional to a company investing Rs.2000 crores in Exploration and production. Refining, Pipelines or Terminals. Such investment should be towards additionality of assests and in the form of equity, equity like instruments or debt with recourse to the company.

- Pricing policy for hydrocarbons should be based on allowing scarcity to be reflected in prices. This will create an incentive for conservation and efficient use of petroleum products.

- Expeditious setting up of regulatory mechanism for downstream sector including pipelines and natural gas.

New and Renewable Sources of Energy

89. Major programmes under Non-Conventional Energy Sector include power generation through wind, small hydro, bio-mass and solar energy, socially oriented programmes to meet rural energy demand such as National Project on Biogas Development (NPBD), National Programme on Improved Chulhas (NPIC), Integrated Rural Energy Programme (IREP), solar energy programmes for applications like lighting, water heating, cooking and pumping water for irrigation. The other programmes relate to hydrogen energy fuel cells, alternate fuel for surface transport, ocean energy etc. in which R&D activities are taken up at present.

90. Ninth Plan outlay contains a Gross Budgetary Support (GBS) of Rs.2,122.14 crore and an IEBR (Internal and Extra Budgetary Resources) of Rs.1,678 crore. At the initiative of the Prime Minister, a Special Action Plan (SAP) has been prepared by the Planning Commission for the "Rapid Improvement of Physical Infrastructure" including inter-alia, non-conventional

energy sources. Under SAP a sum of Rs.200 crores was earmarked out of the total Gross Budgetary Support. The infrastructure related programmes included in the SAP are Small Hydro, Biomass, Cogeneration, Biomass Power, Biomass Gasifier and Solar Photovoltaic programmes. An amount of Rs.3,800.14 crores was approved as the outlay for the Ministry of Non-Conventional Energy Sources (MNES) for Ninth Plan.

Table – 18

Financial Progress

Financing of Central Sector investment during Ninth Plan

(Figures in brackets are at 1996-97 price level) (Rs. Crore)

Sl.No.	YEAR	GBS	IEBR	OUTLAY
1.	9th Plan (Approved)	(2122.14)	(1678.00)	(3800.14)
2.	1997-98 (Actual)	224.38 (212.40)	361.69 (342.38)	586.07 (554.78)
3.	1998-99 (Actual)	293.61 (260.22)	265.30 (235.13)	558.91 (495.35)
4.	1999-2000 (R.E.)	314.65 (263.09)	500.42 (418.41)	815.07 (681.50)
5.	First 3 Years(ant.)	(735.71)	(995.92)	(1731.63)
6.	Expected in last 2 yrs. *	(924.00)	(687.48)	(1611.48)
7.	Likely investment during 9th Plan	(1659.71)	(1683.40)	(3343.11)
8.	9th Plan likely utilisation in %	78.21	100.32	88.00

* Assumes @ 10% growth in nominal terms over the level of 1999-2000

91. It may be seen from the above that against the approved outlay of Rs.3,800.14 crore, Rs.1,731.63 crore is likely to be utilised in first three years of the Plan. This would be 45.56% of the Plan outlay on the basis of 1996-97 prices i.e. at constant prices. The balance 54.44% of the outlay is the investment required during remaining two years to achieve the Plan targets. However, going by the performance in the first three years it is most unlikely that the Plan outlay will be fully utilised.

Physical Progress :

92. The approved Plan targets were 1.26 million biogas plants, 19.6 million improved chulhas, 40 MW biomass gasifiers, 1200 MW of wind power (including private sector participation), 130 MW of small hydro (including private sector) and 314 MW of biomass power and cogeneration with the

participation of private sector. The other programmes were solar photovoltaic, solar thermal systems and R&D activities in respect of new technologies.

Table – 19

Progress in the Power Generation and Socially Oriented Programmes during Ninth Plan

S.No.Type	IX Plan Target	1997-99 Actual	1999-00 Likely Ach.	Likely in 1st 3 yrs	Likely in next 2 yrs	Likely achv. (%IX P)
1. Wind Power(MW)	1200.00	123.00	100.00	223.00	777.00	1000.00 (83.33)
2. Small Hydro(MW)	130.00	39.19	33.52	72.71	70.10	142.71 (109.77)
3. Biomass Power(MW)	314.00	85.00	40.00	125.00	80.00	205.00 (65.29)
4. Urban & Ind. Wastes(MW)	50.00	3.00	6.00	9.00	37.00	46.00 (92.00)
5. Biogas Plants(lakh nos.)	12.60	3.24	1.68	4.92	5.08	10.00 (79.36)
6. Imp. Chulhas (lakh nos.)	196.00	46.10	24.00	70.10	79.90	150.00 (76.53)

Mid-Term Approach for Non-Conventional Energy Programmes

93. Some of the important issues that emerged from the mid-term appraisal of new and renewable sources of energy sector are given below :

i) In order to assess total functionality of biogas plants already installed, evaluation studies by independent agencies or NGOs are to be initiated. Repair and maintenance works are needed in non-functioning plants. MNES has to initiate comprehensive evaluation studies for all their programmes and get their future programmes approved on the basis of the results of such studies.

ii) The present mode of implementing the Improved Chulha Programme is confined to the poorest of the poor in rural areas and on individual beneficiary basis. Unless it is taken up for an entire village including beneficiaries from

higher income groups in the village, the programme may not become successful. Attention is also required to other aspects like training the local people to construct chulhas of better quality and proper maintenance and make them available at prices affordable to the villagers.

iii) The Solar Energy Programmme is implemented through subsidies for solar devices/gadgets. MNES should take up the issue of providing subsidy with concerned Departments./Ministries and justify the solar programme and subsidies provided in comparison with other programmes like LPG, kerosene etc.

iv) There is great potential for meeting the energy requirement in rural and remote areas through non-conventional energy sources. At present the contribution from such energy sources including small hydro power upto 3 MW capacity is around 1.5% of the total installed power generation capacity. There is scope for substantially increasing the contribution from these sources.

v) Necessary publicity and awareness programmes have to be taken up in order to propagate benefits the programmes offer to the people.

vi) In the context of the national objective of providing electricity to all, the electrification of remote areas is of major concern to MNES, REC, SEBs and other agencies. .

It is necessary for REC/SEBs/State Governments to undertake a survey of the remote villages so as to identify the villages to be electrified through decentralised energy sources.

The approach to non-conventional energy programmes in remaining years of the Plan and beyond should be goal oriented so as to meet the energy requirement from different sources like biogas, solar, small hydro, wind, biomass etc. for villages located in remote and inaccessible areas. It is required to identify the remote villages and prepare schemes to meet basic energy needs like lighting, cooking and heating through decentralised energy sources. In this approach the village as a whole is to be taken into account as against the present method of targeting individual beneficiaries and providing systems on individual basis involving significant capital subsidies. Wherever feasible, community systems have to be put up to meet energy requirements in the villages**.**

vii) It is necessary to have uniform guidelines for SEBs to purchase power from non-conventional energy sources like wind, small hydro, biomass and co-generation operated by private entrepreneurs. Independent Renewable Power Producers (IRPP) should have the right to wheel power through existing transmission lines of the SEBs on payment of reasonable charge for selling the power to third party. All hurdles in this regard need to be resolved so as to encourage IRPPs to make their contribution to the promotion of power generation from non-conventional energy sources.

viii) Government has transferred all small hydro power projects above 3 MW capacity but up to 25 MW capacity to MNES, which were earlier within the purview of the Ministry of Power. Performance of MNES in the development of small hydro projects up to 3 MW capacity needs to be improved. Many of the hydro projects up to 25 MW capacity would have inter-state problems. It will cast enormous burden on Government if the financial benefits as are available to projects up to 3 MW capacity are to be extended up to 25 MW- capacity projects as well.. All these aspects need to be addressed urgently so that the policy announced by the Government can be given concrete shape.

ix) There is great potential to meet the basic energy requirement (cooking, heating etc.) of the rural people through non-conventional and renewable sources of energy. People's participation through Panchayats, other local bodies, co-operatives and NGOs would go a long way in realising objectives of such programmes. The achievement in Sagar island in Sundarban area, West Bengal, has shown what community participation can do through NGOs like Ramakrishna Mission and all India Women's Conference; these examples are worth emulating for meeting the energy requirement in rural areas.