Overview of performance

9.3 The capacity creation in infrastructure sectors presented a mixed picture in 2008-09 (Table 9.1). While telecom and petroleum sectors have done well in 2008-09, when compared to the recent years, the power sector exhibited considerable shortfall.

Table 9.1 : Indicators of infrastructure capacity creation

Item	2006-07	2007-08	2008-09
Power capacity addition (MW)	6853	9263	3454
Addition to refinery capacity- petroleum (MT)	7.34	11.72	29.00
Road length upgraded -NHAI - km.	636	1683	2203
Road works completed under PMGSY (km)	30710	41231	52405
RKMs electrified (railways)	361	502	797
Addition to port capacity (MTPA)		27.3	23.6
Addition to switch capacity- telecom (000 lines)	9602.7	7159.0	14392.6

Sources : 1. Ministry of Power, 2. Ministry of Petroleum and Natural Gas, 3. Ministry of Statistics and Programme Implementation, 4. Natinal Rural Roads Development Agency, 5. Ministry of Railways, 6. Department of Shipping.

9.4 The demand for infrastructure products and services is substantially a derived demand. As the economy slumped in activity, consequent to the commodity price and oil price shocks and then the global economic crisis, most infrastructure sectors too witnessed subdued growth in production/services during 2008-09 (Table 9.2). A comparison of the growth figures for H1 2008-09 with H2 2008-09 reveals that the production and services of most of the infrastructure sectors underwent a drastic slowdown in the second half of the year. The port and air cargo growth slowed down considerably, reflecting the sluggishness in import and export growth in the second half of 2008-09. The rail freight growth too slowed down, but to a lesser degree, because the coal sector, which accounts for a substantial chunk of the rail freight experienced robust production. Along with coal, the growth in tele-connectivity stood as exception amidst the general slowdown.

Power

9.5 The growth in electricity generation by power utilities during 2008-09 at 2.7 per cent fell much short of the targeted 9.1 per cent. Despite the sharp decline in hydro and nuclear generation in 2008-09, the growth in total electricity generation was positive due to the 5 per cent plus growth in thermal generation (Table 9.3). It is further seen that, despite being quantitatively smaller, it is the visibly higher growth in power generation in the private sector compared to the Central and state sectors that pushed the growth in total generation close to 3 per cent.

9.6 The negative growth in power generation from hydro stations during 2008-09 was mainly due to less inflow into reservoirs, resulting from low rainfall during the monsoon. Generation of power from nuclear power stations also registered negative growth, mainly due to fuel supply constraints. Other reasons for the lower growth in power generation during the year 2008-09 included: shortage of coal and gas, shortfall in capacity addition, delay in achieving commercial operation/ commencement of full generation from some newly commissioned units due to non-completion of balance of plant works and

Table 9.3 : Power generation (*) by utilities (billion kWh)

	Sector	2007-08	2008-09	Growth (per cent)
Thermal	Central	240.36	245.96	2.3
	State	261.78	280.48	7.1
	Private	56.67	63.66	12.1
	Total	**558.82**	**590.10**	**5.6**
Hydro	Central	41.81	43.36	3.7
	State	76.27	64.50	-15.3
	Private	5.49	5.22	-4.8
	Total	**123.57**	**113.08**	**-8.4**
Nuclear	Central/			
	Total	**16.78**	**14.71**	**-12.3**
Bhutan IMP		5.90	11.8	
All-India	Central	298.95	304.03	1.7
	State	338.05	344.97	2.1
	Private	62.16	68.89	10.6
	Total	**704.45**	**723.80**	**2.7**

Source : Central Electricity Authority

*** Excludes generation from captive and non-conventional plants and thermal plants below 20 MW units and hydro plants below 2 MW.**

Table 9.2 : Growth in infrastructure services/production (per cent)

Item	2006-07	2007-08	*H1 08-09**	*H2 08-09**	*2008-09**
Crude petroleum	5.6	0.4	-0.8	-2.9	-1.8
Petroleum refinery	12.6	6.5	4.5	1.5	3.0
Natural gas	-1.4	2.1	4.8	-1.6	1.4
Coal	5.9	6.0	7.9	8.3	8.1
Electricity generated	7.3	6.3	2.6	2.9	2.7
Railway freight	9.2	9.0	8.5	1.5	4.9
Port cargo	9.5	12.0	7.2	-3.3	2.1
Air export cargo	3.6	7.5	8.0	-1.8	3.4
Air import cargo	19.4	19.7	5.9	-16.6	-5.7
Air passenger traffic (inter)	12.1	11.9	7.2	0.8	3.8
Air passenger traffic (dom.)	34.0	20.6	-7.5	-16.5	-12.1
Cell phone connections-telecom	85.4	38.3			44.8

Source : Ministry of Statistics and Programme Implementation.

*** Figures are provisional.**

initial stabilization problems in some of the new thermal units.

Power deficit

9.7 All-India peak shortage declined in 2008-09 as compared to 2007-08, mainly due to the lower growth in peak demand (0.9 per cent) as compared to growth in peak demand met (6.6 per cent). In contrast, the energy shortage increased, because the growth in requirement (5.1 per cent) was greater than the availability (3.8 per cent) (Figure 9.1). While all regions experienced shortages, western and north-eastern regions experienced the maximum shortages.

Power supply position

9.8 Plant load factor (PLF), a measure of efficiency, has shown a steady improvement over the years. However, the PLF of thermal power stations declined during 2008-09 mainly due to: loss of generation because of shortage of coal, constraints in supply of lignite from the Neyveli plants and delay in attaining commercial operation/ commencement of full generation from some newly commissioned units on account of delay in competition of balance of plant works (Table 9.4).

Table 9.4 : Plants load factor of thermal power stations

(Figures in per cent)

Category	2006-07	2007-08	2008-09*
State Electricity Boards	70.6	71.9	71.2
Central Sector	84.8	86.7	84.3
Private Sector	86.3	90.8	91
REGIONS			
Northern	79.6	81.4	81.8
Western	79.3	80.3	79.5
Southern	83.9	84.9	83.3
Eastern	68.3	69.6	64.7
North-Eastern	16.8	20.4	47.6
All-India	76.8	78.6	77.2

Source : Central Electricity Authority
*** Provisional**

9.9 The power sector uses about 74 per cent of the country's coal production. Coal-fired thermal units account for 66 per cent of total power generation in the country. The dependence on imported coal went up from about 10.2 MT in 2007-08 to about 16.0 MT in 2008-09 (Table 9.5).

Table 9.5 : Coal consumption and imports by power stations (MT)

Year	Consumption	Imports
2005-06	281.3	10.4
2006-07	302.5	9.7
2007-08	329.6	10.2
2008-09	355.0	16.1

Source : Ministry of Power

9.10 Out of the total installed generating capacity in the country, about 10.0 per cent is based on gas or liquid fuel (excluding diesel). The supply of gas to power stations that use gas as the primary fuel remains inadequate (Table 9.6).

Table 9.6 : Gas availability for power

Year	Required at 90% PLF (MMSCMD)*	Shortfall (MMSCMD)	Generation Loss (BUs)**
2005-06	**53.4**	**18.0**	**23.9**
2006-07	61.2	26.1	26.3
2007-08	65.7	27.5	31.2
2008-09	66.6	29.2	33.7

Source : Ministry of Power
*** Based on Normative gas requirements.**
**** Generation loss due to shortage of gas estimated based on operation of power plant at 90 per cent PLF.**
Note: BU – Billion units; MMSCMD – Million Metric Standard Cubic Meter Per Day

Figure 9.1 : Power supply position

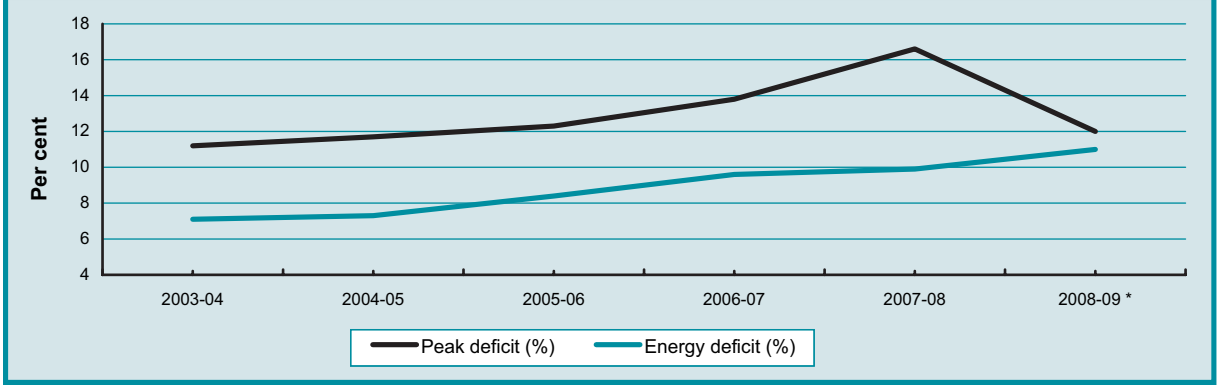

Table 9.7 : Capacity addition during the Eleventh Five Year Plan (MW)

Status	Central	State	Private	Total
Plan target	36874	26783	15043	78700
Commissioned (as on 26.3.2009)	3990	7094	1383	12467
Under construction	29540	18269	19734	67543

Source : Ministry of Power

Capacity addition

9.11 In keeping with the target set by the National Electricity Policy (NEP), 2005 to raise per capita availability from 704 units in 2007-08 to 1,000 units per annum by the end of 2012, a capacity addition of 78,700 MW has been set for the Eleventh Five Year Plan, of which 19.9 per cent is in the hydel sector, 75.8 per cent thermal and the rest nuclear.

9.12 A number of projects envisaged for the Eleventh Five Year Plan have made steady progress, with most of these are in a position to be commissioned well within the plan period. The status of placement of orders for the main plant (thermal projects) and main civil works (for hydro projects) is given as under (Table 9.7).

9.13 The target for 2007-08 was initially fixed at 16,335 MW which was subsequently reduced to 12,039 MW. Against this revised target, a capacity addition of 9,263 MW, comprising 2,423 MW hydro, 6,620 MW thermal and 220 MW nuclear was achieved during the year. A capacity addition target of 11,061 MW comprising of 9,304 MW thermal, 1,097 MW hydro and 660 MW nuclear was originally planned for 2008-09. On account of revision in definition of commissioning of thermal projects, the capacity addition target for the year 2008-09 has been revised as 7,530 MW comprising of 5,773 MW thermal, 1,097 MW hydro and 660 MW nuclear, against which a capacity of 3,454 MW has been added up to 31.03.2009 (Table 9.8). (As per the new definition, commissioning of the plant is "related to actual output in the form of generation that is emerging from plant for auxiliary consumption and input to the grid based on its designated fuel and completion of all plants and equipments required for fuel handling and safe operation of the plant.")

9.14 The main reasons for under achievement of capacity addition targets during 2007-08 and 2008-09 were delayed and non-sequential supply of material by suppliers, shortage of skilled manpower for construction and commissioning of the projects, contractual disputes between project authorities, contractors and their sub-vendors, delay in readiness of balance of plants (BOPs) by the executing agencies, shortage of fuel (gas and nuclear) and design problem in CFBC boiler (Giral Lignite TPP).

Table 9.8 : Capacity addition during 2008-09 (MW)

		Target*	Achievement	Achievement (per cent)
Thermal	Central	2910	750	25.8
	State	2957	852	28.8
	Pvt.	3437	883	25.7
	Total	**9304**	**2485**	**26.7**
Hydro	State	1097	969	88.3
	Total	**1097**	**969**	**88.3**
Nuclear	Central	660	Nil	Nil
	Total	**660**	**Nil**	**Nil**
All-India	Central	3570	750	21.0
	State	4054	1821	44.9
	Pvt.	3437	883	25.7
	Total	**11061**	**3454**	**31.2**

Source : Central Electricity Authority
*** Unrevised**

Monitoring of capacity addition

9.15 The Ministry of Power has adopted a monitoring system of capacity addition with three broad levels: the Central Electricity Authority (CEA), Ministry of Power (MoP) and Power Project Monitoring Panel (PPMP). CEA and Ministry of Power hold quarterly review meetings with developers and other stakeholders.

Ultra mega power projects

9.16 Under the coal-based Ultra Mega Power Projects (UMPPs), each with a capacity of 4,000 MW, nine sites were identified; one each in Chhattisgarh, Jharkhand, Madhya Pradesh, Orissa, Andhra Pradesh, Gujarat, Karnataka, Maharashtra and Tamil Nadu. Development work is being undertaken in the Mundra Project awarded to the Tata Power company and the Sasan and Krishnapatnam UMPPs awarded to the Reliance

Power Ltd. Financial bids in respect of Tilaiya UMPP were opened on 28.01.2009 wherein the Reliance Power Ltd. at a levelized tariff of Rs. 1.770 per kWh has emerged the successful bidder. Letter of Intent (LOI) was issued on 12.02.2009.

Development of hydro power

9.17 There are 40 hydro projects with an aggregate capacity of 13,085 MW under construction. The main reasons for the slow development include difficult and inaccessible potential sites, difficulties in land acquisition, rehabilitation, environmental and forest-related issues, inter-state issues, geological surprises and long gestation period. Private sector participation has been increasing; there are 11 schemes with an installed capacity of 4,111 MW under construction in private sector. 84 schemes with an installed capacity 22,383 MW have been allotted to private developers by states. Bulk of the potential which is in the Himalayan region is yet to be tapped. Out of the 162 projects for which preliminary feasibility reports were prepared under the 50,000 MW H.E. initiative, 77 schemes (33,951 MW) have been taken up for detailed survey & investigation and preparation of detailed project report/implementation. So far, DPRs for 18 schemes have been prepared.

9.18 Under the new hydro policy, the dispensation for project development allowed for PSUs would be available to the private sector for a period of five years. The affected families are expected to get a better relief and rehabilitation (R&R) package. For the developer, the risks associated with construction, operation and maintenance would be reduced and early financial closure would be facilitated. The task force, headed by the Minister of Power, shall resolve issues relating to allocation of sites, clearances, environment and wildlife issues, compensation to host states, land acquisition, rehabilitation and resettlement, sharing costs and benefits of power generation, water storage, navigation and flood moderation. A task force has been constituted for developing the model contract documents for the hydro power projects.

Merchant power plants

9.19 The concept of merchant sale of power is part of the new “Hydel Policy 2008”. To enable the project developer to recover costs incurred in obtaining the project site, he would be allowed a special incentive by way of merchant sales up to a maximum of 40 per cent of the saleable energy. In case of thermal plant, merchant sale up to 15 per cent can be allowed.