Energy, Infrastructure and Communications

11 CHAPTER

The Eleventh Five Year Plan emphasized the need for removing infrastructure bottlenecks for sustained growth. It, therefore, proposed an investment of US $500 billion in infrastructure sectors through a mix of public and private sectors to reduce deficits in identified infrastructure sectors. As a percentage of the gross domestic product (GDP), investment in infrastructure was expected to increase to around 9 per cent. For the first time the contribution of the private sector in total investment in infrastructure was targeted to exceed 30 per cent. Total investment in infrastructure during the Eleventh Plan is estimated to increase to more than 8 per cent of GDP in the terminal year of the Plan --higher by 2.47 percentage points as compared to the Tenth Plan. The private sector is expected to be contributing nearly 36 per cent of this investment.

11.2 An analysis of the creation of infrastructure in physical terms indicates that while the achievements in some sectors have been remarkable during the Eleventh Plan as compared to the previous FiveYear Plans, there have been slippages in some sectors. The success in garnering private-sector investment in infrastructure through the public-private partnership (PPP) route during the Plan has laid solid foundation for a substantial step up in private-sector funding in coming years. PPPs are expected to augment resource availability as well as improve the efficiency of infrastructure service delivery. During the Plan, administrative ministries and other government agencies have adopted the standardized model concession agreements and bid documents to streamline and accelerate the decision making in a fair, transparent, and competitive manner. Several state governments and local bodies have also rolled out PPP projects.

11.3 The Planning Commission, in its aproach paper has projected an investment of over ₹ 45 lakh crore (for about US $1 trilion) during the Twelfth Plan (2012-17). It is projected that at least 50 per cent of this investment will come from the private sector as against the 36 per cent anticipated in the Eleventh Plan and public sector investment will need to increase to over ₹ 22.5 lakh crore as against an expenditure of ₹ 13.1 lakh crore during the Eleventh Plan. Financing infrastructure will, therefore, be a big challenge in the coming years and will require some innovative ideas and new models of financing.

Overview of Performance

11.4 Performance of broad sectors and sub-sectors in key infrastructure areas in the current year presents a mixed picture. There was an improvement in growth in power, petroleum refinery, cement, railway freight traffic, passengers handled at domestic terminals, and upgradation of highways by the National Highways Authority of India (NHAI). Coal, natural gas, fertilizers, handling of export cargo at airports, and the number of cell phone connections showed negative growth. Steel sector witnessed moderation in growth. Growth for core industries and infrastructure services during April-December 2011-12 is given in Table 11.1.

11.5 The performance in core and infrastructure sectors is still to a large extent dependent on public sector projects. Ministry of Statistics and

Table 11.1 : Growth in core industries and infrastructure services (in per cent)

Sl. No.	Sector	2007-08	2008-09	2009-10	2010-11	2011-12 (April-Dec.)
1	**Power**	**6.3**	**2.5**	**6.8**	**5.7**	**9.3**
2	**Coal**	**6.0**	**8.2**	**8.0**	**0.0**	**-2.7**
3	**Finished steel**	**6.8**	**13.2**	**3.2**	**9.6**	**5.7**
4	**Fertilizers**	**-8.6**	**-2.6**	**13.2**	**1.0**	**-0.5**
5	**Cement**	**7.8**	**7.6**	**10.1**	**4.3**	**5.1**
6	**Petroleum:**					
	a) Crude oil	0.4	-1.8	0.5	11.9	1.9
	b) Refinery	6.5	3.0	-0.4	3.0	4.1
	c) Natural gas	2.1	1.4	44.8	9.9	-8.8
7	**Railway revenue-earning freight traffic**	**9.0**	**4.9**	**6.6**	**3.8**	**4.7**
8	**Cargo handled at major ports**	**12.0**	**2.2**	**5.7**	**1.6**	**0.4**
9	**Civil aviation:**					
	a) Export cargo handled	7.5	3.4	10.4	13.4	-1.1
	b) Import cargo handled	19.7	-5.7	7.9	20.6	1.4
	c) Passengers handled at international terminals	11.9	3.8	5.7	11.5	7.2
	d) Passengers handled at domestic terminals	20.6	-12.1	14.5	16.1	17.5
10	**Telecommunications: Cell phone connections**	**38.3**	**80.9**	**47.3**	**18.0**	**-51.0**
11	**Roads: Upgradation of highways***					
	i) NHAI	164.6	30.9	21.4	-33.3	8.9
	ii) NH(O) & BRDB	12.5	17.3	4.0	-6.8	-36.5

Source **: Ministry of Statistics and Programme Implementation (MOSPI).**
*** Includes Widening to four lanes & two lanes and Strengthening of existing weak pavement only.**
 # provisional
Notes **: NH(O) stands for National Highways Organization and BRDB for the Border Roads Development Board(BRDB).**

Programme Implementation (MOSPI) has been monitoring the progress of all central-sector projects costing ₹ 150 crore and above. The flash report for the month of October 2011 tracks the progress of 583 projects in different sectors. Out of these 583 projects, only seven are ahead of schedule, 166 are on schedule, 235 are delayed and remaining 175 projects have been sanctioned without specifying any commissioning schedule. The original cost of the 583 projects when sanctioned was ₹ 7,12,812 crore but this was subsequently revised to ₹ 8,21,665 crore, implying a cost overrun of 15.3 per cent. The expenditure incurred on these projects till October 2011 was ₹ 3,44,361 crore, which is 41.9 per cent of the revised cost.

11.6 Maximum number of projects delayed relate to road transport and highways (90), followed by power (45), petroleum (29), railways (26), and coal (17). In the railways sector, out of the total of 132 projects costing more than ₹ 150 crore, in 101 the anticipated cost is 181 per cent higher than the original estimated cost. Likewise cost overruns of 17 projects in the petroleum sector are expected to be 32 per cent. 12 projects in coal and 13 projects in road transport are expected to have cost overruns of 29 per cent and 61 per cent respectively. The delay in railways ranges from 2 to 213 months and in road transport and highways from 4 to 106 months. Analysis based on the flash report highlights sub-optimal project implementation across all the major sectors. While some of the

project delays are due to exogenous factors beyond the control of the implementing agencies, in the majority of cases the delays are mainly due to a dismal record of project implementation starting from project identification and designing to undue delays in procurement (both tendering and contracting) and ineffective project monitoring. Such delays increase project risks and costs and could be minimized.

Power

Generation

11.7 Electricity generation by power utilities during 2011-12 was targeted to increase by 5.4 per cent to reach 855 billion units. Growth in power generation during April-December 2011 was 9.2 per cent as compared to 4.6 per cent during April-December 2010. Nuclear, hydro, and thermal generation registered a growth of 33.2 per cent, 19.2 per cent, and 6.7 per cent respectively (Table 11.2). In the first nine months 76 per cent of the generation target has been achieved.

11.8 In the thermal category, growth in generation from coal, lignite, and gas-based stations in the current fiscal (April-December) was of the order of 9.2 per cent, 3.8 per cent, and - 4.0 per cent respectively. The overall plant load factor (PLF), a measure of efficiency of thermal power stations, at 72.1 per cent during April-December 2011 was marginally lower than the PLF of 72.9 per cent achieved during April-December 2010. PLF in the current year, however, exceeded the target of 68.2 per cent for the first three quarters (Table 11.3 and Figure 11.1).

Table 11.3 : Thermal power generation during April-December 2011

Components	Generation (Billion KWh)	Growth (%)	PLF (in per cent) Apr.-Dec. 2010	Apr.-Dec. 2011
Coal	423.554	9.17	73.24	72.32
Lignite	19.567	3.82	70.82	68.55
Gas turbine	72.198	- 4.0	66.03	61.91
Diesel	1.797	-13.07	-	-
Thermal total	517.1	166.65	72.88	72.10

Source : Ministry of Power.

11.9 The sector-wise and region-wise break-up of the PLF from 2008-9 to 2011-12 (April to December 2011) shows wide variation across regions and sectors (Table 11.4). In the current year, while the PLF of the central-sector utilities moderated, private-

Table 11.2 : Power Generation by Utilities (Billion KWh)

Category	2009-10	2009-10	April-December 2010-11	April-December 2011-12	Growth (per cent)
Power generation	771.551	811.143	598.244	653.446	9.23
Hydroelectric #	106.680	114.257	90.169	107.513	19.23
Thermal	640.876	665.008	484.860	517.116	6.65
Nuclear	18.636	26.266	17.854	23.790	33.24
Bhutan import	5.358	5.610	5.360	5.028	-6.19

Source : Ministry of Power;

Note: # Excludes generation from hydro stations up to 25 Mega Watt (MW).

Figure 11.1 Trend of the national average of PLF of thermal plants

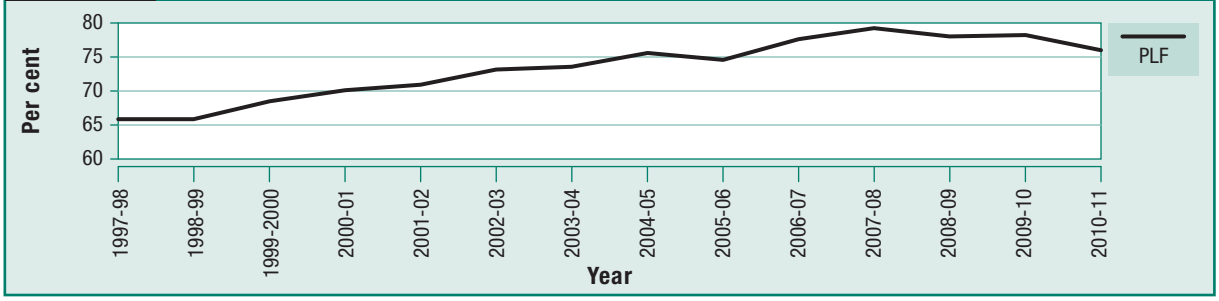


Table 11.4 : PLF of Thermal Power Stations

(per cent)

Category	2008-09	2009-10	2010-11 (Apr.-Dec.)	2011-12 (Apr.-Dec.)
i) State sector	71.20	71.13	66.72	66.11
ii) Central sector	84.30	85.64	85.12	80.15
iii) Private sector (Utilities)	91.04	82.41	76.70	78.09
REGIONS				
i) Northern region	81.79	82.99	78.68	76.98
ii) Western region	79.45	79.20	75.26	70.80
iii) Southern region	83.30	84.39	80.43	80.25
iv) Eastern region	64.66	64.71	66.58	62.10
v) North-eastern region	47.62	49.97	-	-
All India	**77.27**	**77.53**	**75.08**	**72.10**

Source **: Ministry of Power.**

sector utilities witnessed an improvement. The PLF of utilities in the state sector remained lower than that of private- and central-sector utilities. In terms of regional spread, moderation in PLF in the current year was across all the regions. Utilities in the eastern and north-eastern region continued to have a lower PLF.

Power deficit

11.10 The deficit in power supply in terms of peak availability and total energy availability declined during the Eleventh Five Year Plan. While the energy deficit decreased from 9.6 per cent in the terminal year of the Tenth Plan (2006-7) to 7.9 per cent during April-December 2011, peak deficit declined from 13.8 per cent in 2006-7 to 10.6 per cent during the current financial year (up to December 2011).

Capacity addition

11.11 The Eleventh Five Year Plan initially envisaged a capacity addition of 78,700 MW, of which 19.9 per cent was hydro, 75.8 per cent thermal, and the rest nuclear. At the time of the Mid Term Appraisal (MTA) of the Eleventh Plan, the target was revised to 62,374 MW with thermal, hydro, and nuclear segments contributing 50,757 MW, 8,237 MW and 3,380 MW respectively. A capacity addition of 46,669.7 MW has so far been achieved until 15 January 2012. Projects with a capacity of 7,645 MW are under construction for commissioning during the remaining period. Capacity addition during the Eleventh Plan is, therefore, expected to be about 50,000 to 52,000 MW.

11.12 In the thermal sector, capacity addition continued to keep its momentum throughout the Plan period, except in the second year. During 2007-8, the first year of the Eleventh Five Year Plan, 9,263 MW thermal capacity was added. In 2008-9, as against a target of 7,530 MW, a capacity of only 3,454 MW could be added. Capacity addition during 2009-10 and 2010-11 was 9,585 MW and 12,160 MW respectively. In the current fiscal year, i.e. 2011-12, capacity addition of 17,601 MW has been planned and until 15 January 2012, 12,207.7 MW has already been added. This is the highest capacity addition ever achieved in a single year. The fuel-wise and sector-wise break up of capacity addition, targets, and achievements is given in Table 11.5:

Ultra Mega Power Projects (UMPPs) Initiative

11.13 The Ministry of Power launched an initiative for development of coal-based super critical UMPPs, each of about 4000 MW capacity, under Case II bidding route. Four UMPPs at Sasan in Madhya Pradesh, Mundra in Gujarat, Krishnapatnam in Andhra Pradesh, and Tilaiya in Jharkhand have already been transferred to the identified developers and are at different stages of implementation. One unit of 800 MW of the Mundra UMPP is expected to be commissioned in the Eleventh Plan. The

Table 11.5 : Capacity Addition (Target and Achievement) during April 2011 – 15 January 2012

(MW)

Sector	Thermal		Hydro		Nuclear		Total		Per cent to target
	Target	Actual	Target	Actual	Target	Actual	Target	Actual	
Central	3070.0	2820.0	655.0	0.0	2000.0	0.0	5725.0	2820.0	49.3
State	4101.0	1537.2	165.0	81.0	0.0	0.0	4266.0	1618.2	37.9
Private	6440.0	6669.5	1170.0	1100.0	0.0	0.0	7610.0	7769.5	102.1
Total	**13611.0**	**11026.7**	**1990.0**	**1181.0**	**2000.0**	**0.0**	**17601.0**	**12207.7**	**69.4**

Source **: Ministry of Power.**

remaining units of Mundra and other awarded UMPPs, except for the last unit of Tilaiya UMPP, are expected to be commissioned in the Twelfth Plan.

Development of hydro-power

11.14 As per a reassessment study carried out by the Central Electricity Authority (CEA), the identified hydroelectric potential of the country (having installed capacity above 25 MW) is 1,45,320 MW. As of now, 434 projects/schemes as detailed in Table 11.6 are at different stages of operation/ approval/investigation.

11.15 During the Eleventh Five Year Plan, initially hydro capacity addition of 15,627 MW was planned which at the time of MTA of the plan was revised to 8,237 MW. Of this, 5,302 MW has been added till 31 December 2011. The main reasons for slow development of hydro-power include difficult and inaccessible potential sites, difficulties in land acquisition, rehabilitation, environmental and forest-related issues, inter-state issues, geological surprises, and contractual issues. A multi-pronged strategy has been adopted to harness the hydro-potential resources in the country. Some of the policy measures and initiatives taken by the government are finalization of an investor-friendly New Hydro Policy 2008, a liberal National Rehabilitation and Resettlement Policy, and a 50,000 MW Hydroelectric Initiative and Mega Power Project Policy. All the provisions of Hydro Policy 2008 including merchant sale up to a maximum of 40 per cent of the saleable energy is now applicable to all developers, i.e. private as well as public. Further cost plus tariff regime has been extended for public- as well as private-sector hydro-power projects up to December 2015.

Table 11.6 : Exploitation of Hydroelectric Potential

	No of projects/ schemes	Capacity (MW)
Under operation	177	38748
Under construction	50	15065
Approved by CEA	57	29443
DPR under examination	48	15009
Survey & investigation	102	30193
Total	**434**	**128458**

Source **: Ministry of Power**
Notes **: DPR stands for detailed project report.**

Transmission, Trading, Access, and Exchange

National Grid

11.16 An integrated power transmission grid helps to even out supply-demand mismatches. The existing inter-regional transmission capacity of 23,800 MW connects the northern, western, eastern, and north-eastern regions in a synchronous mode operating at the same frequency and the southern region asynchronously operating in the same mode. This has enabled inter-regional energy exchanges of about 39,275 million units (MUs) during April-November 2011, thus contributing to better utilization of generation capacity and an improved power supply position. Proposals are under way for synchronous integration of the southern region with other regions.

Open access

11.17 Competition in the electricity sector has been augmented by having an open access system allowing a buyer to choose his supplier and a seller to choose his buyer. Open access at inter-state transmission level is now fully functional. The facilitative framework created by the Central Electricity Regulatory Commission (CERC) in this regard has provided the desired regulatory certainty for developers in terms of market access, and also payment security against default. The CERC has issued the Central Electricity Regulatory Commission (Open Access in Inter-state Transmission) Regulations 2008 for short-term open access in inter-state transmission. During 2010-11, 19,883 inter-state short term open access transactions (including bilateral and collective) were approved for 55,232 MUs. During the year 2011-12 (up to 11 December, 2011) transaction of 52,290 MUs energy has been approved through 17,340 inter-state short-term bilateral and collective open access transactions. The Commission has also notified the Central Electricity Regulatory Commission (Grant of Connectivity, Long-term Access and Medium-term Open Access in Inter-state Transmission and Related Matters) Regulations 2009 for connectivity, long-term access, and medium-term open access. These regulations provide a facilitative framework for development of a transmission network based on connectivity and long-term access sought by long-term access customers.

11.18 The Central Transmission Utility (CTU), which is responsible for granting connectivity, medium-term open access, and long-term access,

has received 141 applications for connectivity involving generation capacity of 1,52,850 MW, out of which 58 applications have been approved for the connectivity of 55,940 MW. The CTU has approved 23 applications for 1,095 MW for medium-term open access against the total of 27 applications for 3,160 MW. The CTU has also approved 138 applications for 83,900 MW for long-term access against the total of 185 applications received for 1,59,600 MW.

Trading of Electricity

11.19 Trading in power is enabled through electricity traders and power exchanges. Power trading helps generation resource optimization by facilitating trade and flow of power across the country with varied geography, climatic conditions, and natural resource endowments. It has helped in sale of surplus power available with distributing utilities and captive power plants on one hand and purchase of power by deficit utilities to meet sudden surges in demand. Short-term markets also provide generators with an alternative to sell power other than through long-term power purchase agreements (PPAs). The CERC grants inter-state trading licences. It has so far granted 55, of which 43 are in existence as on 31 December 2011. There is a cap on trading margins which can be charged by traders. For short-term contracts, with power price less than ₹ 3/ kWh, the trading margin is ₹ 0.04 per unit and for power price above ₹ 3 /kWh, the margin is capped at ₹ 0.07 per unit.

Aggregate Technical and Commercial (AT&C) losses and Restructured APDRP

11.20 The focus of the Restructured Accelerated Power Development Reforms Programme (R-APDRP) is on actual, demonstrable performance in terms of reduction in AT&C loss. Projects under the scheme are taken up in two parts in urban areas-towns and cities with population of more than 30,000 (10,000 in case of special category states). Part A of the scheme includes projects for establishment of baseline data and information technology (IT) applications for energy accounting/auditing and IT-based consumer service centers. Part B of the scheme includes regular distribution strengthening projects. These include renovation, modernization, and strengthening of 11 kV-level substations, transformers/transformer centres, re-conductoring of lines at 11kV level and below, load bifurcation, load balancing, and high voltage distribution systems (HVDS) and installation of capacitor banks and mobile service centres, etc. In exceptional cases, where the sub-transmission system is weak, strengthening at 33 kV or 66 kV levels may also be considered. So far (as on 01-01-2012) under Part A (IT), projects worth ` 5,196.50 crore covering all the eligible towns (1,402) in 29 states/union territories (UTs), under Part A (SCADA) projects worth ` 1,385.87 crore covering all the eligible towns (60) in 13 states and under Part B, 1,039 projects worth ` 23,658.18 crore in 19 states have been sanctioned.

National Electricity Fund

11.21 The Cabinet Committee on Economic Affairs (CCEA) approved the National Electricity Fund (Interest Subsidy Scheme) to provide interest subsidy aggregating to ` 8,466 crore on loan disbursement amounting to ` 25,000 crore to the state power utilities - both in the public and private sectors--to improve the distribution network. The preconditions for eligibility to avail of interest subsidy are linked to the reforms in the power sector and the amount of interest subsidy is linked to the progress achieved in reforms.

Rural Electrification

11.22 Under the Rajiv Gandhi Gramin Vidyutikaran Yojana (RGGVY), 1,00,917 villages have been electrified and free electricity connections released to 179.41 lakh below poverty line (BPL) households up to 31 December 2011. Under the Tenth Five Year Plan, 235 projects covering 68,763 villages and 83.10 lakh BPL connections were sanctioned at a cost of ` 9,733.35 crore. During the Eleventh Plan period, as on 31 December 2011, 343 projects have been sanctioned for implementation at a cost of ` 16,784.06 crore for electrification of 49,912 villages and release of connections to 164.31 lakh BPL households. Till 31 December 2011, 341 projects out of the 343 sanctioned under the Eleventh Plan have been awarded and franchisees are in place in 1, 45,950 villages in 17 states.

Petroleum

Oil and Gas Production

11.23 During the current financial year (2011-12), production of crude oil is estimated at 38.19 million metric tonnes (MMT), which is about 1.33 per cent higher than the 37.70 MMT produced during 2010-11. Domestic crude oil production during April-December 2011-12 was 28.70 MMT showing a growth of 1.9 per cent over the same period of the previous year. Crude oil production by Rajasthan

Cairn Energy India Pvt. Ltd. had started with effect from 29 August 2009. The crude oil production from Rajasthan block during April-December 2011 was 4.80 MMT against total production of 5.148 MMT during 2010-11.

11.24 Natural Gas production during April-December 2011-12 was 36.19 billion cubic metre (BCM) as compared to 39.68 BCM during the same period of the previous year. The projected production for natural gas, including coal bed methane (CBM) for 2011-12 is 51.67 (BCM), which is 1.05 per cent lower than the actual production of 52.22 BCM in 2010-11. The current gas production during April-December 2011-12 from KG-D6 field is about 12.36 BCM against the actual production of 15.82 BCM during the same period in 2010-11. The gas production has reportedly decreased due to drop in pressure in the wells and increased water ingress leading to lower output of gas per well.

Exploration of Domestic Oil and Gas

11.25 The New Exploration Licensing Policy (NELP) was adopted in 1999. Under NELP 103 oil and gas discoveries have been made by private/joint venture (JV) companies in 34 blocks and more than 600 MMT of oil equivalent hydrocarbon reserves have been added. As on 1 April 2011, investment made by Indian and foreign companies was of the order of US $15.88 billion, out of which, US $8.51 billion was on hydrocarbon exploration and US $7.37 billion on development of discoveries. At present, after conclusion of eight rounds of NELP, 235 production-sharing contracts have been signed. With a view to further accelerating the pace of exploration, in the ninth round of NELP (NELP-IX), 34 exploration blocks were offered. These 34 exploration blocks include 8 deepwater blocks, 7 shallow water blocks, 11 on-land blocks, and 8 Type-S on-land blocks. On-land blocks are spread over six states, namely Assam (2), Gujarat (11), Madhya Pradesh (2), Rajasthan (2), Tripura (1) and Uttar Pradesh (1). Bids for 33 blocks are under evaluation and blocks are likely to be awarded during 2011-12.

Domestic Exploration of Other Gaseous Fuel

CBM

11.26 India has the fourth largest proven coal reserves in the world and holds significant prospects for exploration and exploitation of CBM. Under the CBM policy, 33 exploration blocks have been awarded in the states of Andhra Pradesh, Assam, Chhattisgarh, Gujarat, Jharkhand, Madhya Pradesh, Maharashtra, Orissa, Rajasthan, Tamil Nadu, and West Bengal. Out of the total available coal-bearing area of 26,000 sq. km for CBM exploration in the country, exploration has been initiated in about 17,000 sq. km. The prognosticated CBM resources in the country are about 92 trillion cubic feet (TCF), out of which only 8.92 TCF has so far been established. Commercial production of CBM in India has now become a reality with current CBM gas production of about 0.23 million metric standard cubic metre per day (MMSCMD). The CBM gas produced in the country is being utilized by the nearby industries in and around Raniganj block in West Bengal. Efforts are also being made in Sohagpur block in Madhya Pradesh, Raniganj (south) in West Bengal, and Jharia in Jharkhand for commencement of commercial production at the earliest.

Shale Gas

11.27 Shale gas can emerge as an important new source of energy in the country. India has several shale formations which seem to hold shale gas. These formations are spread over several sedimentary basins such as Cambay, Gondwana, Krishna-Godawari, and Cauvery. The Directorate General of Hydrocarbons (DGH) has initiated steps to identify prospective areas for shale gas exploration. A multi-organizational team (MOT) of DGH, Oil and Natural Gas Corporation (ONGC), Oil India Limited (OIL), and Gas Authority of India Limited (GAIL) has been formed by the government for analysing the existing data set and suggesting the methodology for shale gas development in India. Further, the Ministry of Petroleum and Natural Gas has signed a memorandum of understanding (MoU) with the USA on 6 October 2010 for assessment of shale gas resources in India, imparting training to Indian geo-scientists and engineers, and providing assistance in formulation of regulatory frameworks.

Equity Oil and Gas from abroad

11.28 In view of an unfavourable demand-supply balance of hydrocarbons in India, acquiring equity oil and gas assets overseas is one of the important components of enhancing energy security. The government is encouraging national oil companies to aggressively pursue equity oil and gas opportunities overseas. Total availability of oil and gas through these overseas contracts is eqvivalent

to around 10.5 per cent of domestic production. The acquisition of overseas oil and gas has been primarily spearheaded by ONGC Videsh Limited (OVL), the wholly owned subsidiary of the ONGC. Apart from OVL (40 Projects in 15 Countries), the other oil public-sector units (PSUs), namely Indian Oil Corporation Limited (IOCL) (9 Projects in 6 Countries), Oil India Limited (OIL) (12 Projects in 8 Countries), Bharat Petroleum Corporation Limited (BPCL) (12 Projects in 7 Countries), GAIL India Limited (4 Projects in 2 Countries), and Hindustan Petroleum Corporation Limited (HPCL) (2 Projects in 2 Countries), have acquired overseas exploration acreages. Among other government companies, the Gujarat State Petroleum Corporation (GSPC), a Government of Gujarat enterprise, has also acquired overseas hydrocarbon-bearing assets.

11.29 The total investment by oil PSUs (OVL, OIL, GAIL, IOCL, BPCL & HPCL) overseas is more than ₹ 64,832 crore, which includes two pipeline projects in Sudan and Myanmar. OVL's total oil and gas production from its overseas assets in Sudan, Vietnam, Venezuela, Russia, Syria, Colombia, and Brazil during 2010-11was about 9.45 million metric tonnes of oil equivalent (MMTOE) . In 2011, the consortium of OVL (OVL-25per cent) and KazMunaiGas (KMG- 75per cent) has acquired stake in Satpayev block, Kazakhstan. The production from the OVL assets abroad in Sudan, Sudan south, Vietnam, Venezuela, Russia, Syria, Colombia, and Brazil was about 6.76 MMTOE during April-December 2011 as against 7.06 MMTOE in the corresponding period of the previous year. The reason for the shortfall is mainly geopolitical upheavals in Sudan and Syria.

Import of Liquefied Natural Gas (LNG)

11.30 To cater to the country's growing gas demand, Petronet LNG Limited (PLL) is constantly engaged with various LNG producers/suppliers as well as upcoming conventional and non-conventional LNG projects especially in Western Australia. During 2010-11, PLL imported 8.64 million metric tonnes (MMT) of LNG at its Dahej Terminal. Total LNG imports during April-December 2011 were to the tune of 8.17 MMT against the total import of 8.95 MMT during 2010-11.

11.31 In 2011, PLL has also entered into an MoU with Gazprom Marketing and Trading Singapore Pte. Ltd. (affiliate of OAO Gazprom, Russia) for sourcing up to 2.5 million metric tonnes per annum (MMTPA) of LNG on long-term basis and pursuing discussions on a sale and purchase agreement. Possibilities are also being explored for availability of any diversion of gas available in the US market on account of shale gas finds. PLL is developing another greenfield project of 5.0 MMTPA capacity at Kochi in the State of Kerala. The construction is going on full swing and the terminal is scheduled to be commissioned by the last quarter of 2012. PLL is planning to expand its Dahej terminal capacity from 10 MMTPA to 15 MMTPA. In addition to this, it is exploring the possibility of setting up an LNG terminal on the east coast of India and has shortlisted certain ports. A preliminary market demand assessment study has been carried out and preparation of a Detailed Feasibility Report has been initiated.

Refining Capacity

11.32 The total refining capacity in the country as on 1 January 2012 is 193.39 MMTPA, of which 116.89 MMT is in the public sector, 6.00 MMT in joint ventures, and the balance 70.50 MMTPA in the private sector. Out of the 21 refineries operating in the country, 17 are in public sector, 3 in private sector, and 1 is a joint venture of BPCL and Oman Oil Company. The refinery capacity is further expected to increase to 214.07 MMTPA by the end of 2011-12. Refinery production (crude throughput) during 2010-11 had reached 206.15 MMT (including Jamnagar Refinery under a special economic zone [SEZ] by Reliance Industry Ltd.), showing an increase of 6.9 per cent compared to 192.77 MMT in 2009-10. During the current financial year (April-December 2011-12), refinery production was 158.26 MMT. The country is not only self-sufficient in refining capacity for its domestic consumption but also substantially exports petroleum products. During 2010-11, the country exported 59.13 MMT of petroleum products worth ₹ 1,96,112 crore.

Pipeline Network and City Gas Distribution (CGD) Network

11.33 There has been substantial increase in the pipelines network in the country with 31 product pipelines of a length of 11,274 km and capacity of 69.19 MMT at present. The additional network of pipelines in crude, LPG, and gas distribution is shown in Table 11.7.

11.34 With increased availability of gas in the country, the network of city gas distribution (CGD) has been enlarged to cover various cities supplying gas for domestic consumers, public transport, and

Table 11.7 : Pipeline Networks

Pipelines	Area (km)	Capacity
16 crude pipelines	8558	106.45 MMT
LPG pipelines	2313	3.94 MMT
Gas pipelines	13508	334 MMSCMD
Gas pipelines—capacity addition	9300	264 MMSCMD
Gas pipelines Authorized by Petroleum and Natural Gas Regulatory Board	4300	184 MMSCMD

Source **: Ministry of Petroleum and Natural Gas.**

commercial/ industrial entities. At present, there are a total of 588 CNG stations spread across the country. The current consumption of gas in the CGD network, operating in 43 geographic areas (GAs), is around 14 MMSCMD of which 6.63 MMSCMD is from regasified liquefied natural gas (RLNG). In Vision 2015, it is envisaged to provide piped natural gas (PNG) to more than 200 cities across the country. The Petroleum and Natural Gas Regulatory Board (PNGRB) has recently invited bids for authorization of CGD in these cities. The PNGRB has envisaged a roll-out plan of CGD network development through competitive bidding in more than 300 possible GAs on the basis of expressions of interest (EOI) submitted to the Board and on suo moto basis. During the Twelfth and Thirteenth Plans, the PNGRB has targeted a roll-out of CGD projects in 121 and 150 cities respectively.

Rajiv Gandhi Gramin LPG Vitaran Yojana (RGGLVY)

11.35 Vision 2015 adopted for the LPG sector inter alia focuses on raising the population coverage of LPG in rural areas and areas where LPG coverage is low. The RGGLVY for small size LPG distribution agencies has been launched on 16 October 2009. Under this scheme 5.5 crore new LPG connections are to be released to cover 75 per cent population as LPG users by 2015. Public-sector oil marketing companies (OMCs) are assessing/ identifying locations in a phased manner under the RGGLVY. Advertisements inviting applications for distributorships under the scheme have been released by OMCs in 26 states. Letters of intent (LOI) has been issued for 1,377 locations out of which 782 distributors have already been commissioned. Selection for the rest of the locations is in progress.

Free LPG Connections to BPL Rural Households

11.36 A proposal for release of one-time grant of ₹ 1400 to each BPL household for a new LPG connection up to a limit of 35 lakh families per year has been formulated by the Ministry of Petroleum and Natural Gas. One-half of this expenditure is to be borne out of gross budgetary support (GBS) and the remaining 50 per cent is to be borne partly from the corporate social responsibility (CSR) funds of the six major oil companies, i.e. ONGC, IOCL, BPCL, HPCL, OIL, and GAIL, and partly by the three oil marketing companies IOCL, BPCL, and HPCL in the ratio of LPG connections released to BPL families by each company. During 2011-12, a total of 8 lakh connections will be released. The financial implication for these 8 lakh connections is estimated at ₹ 112 crore.

Coal

11.37 More than 90 per cent of the coal production in India is of non-coking coal. The production of raw coal during April-November 2011 was 307 million tonnes (MT), as against 320 MT in the same period of the previous year. Coking coal production during this period was 28.3 MT against a production of 28.7 MT during the same period last year. Both coking and non-coking coal registered a negative growth in production in the current year compared to a growth of 8.0 per cent in 2009-10. The lower growth in production during the current year and last year is primarily due to environmental restrictions, application of the comprehensive environmental pollution index (CEPI), non-availability of forestry clearance against some of the projects, poor law and order situation in some states and excessive rainfall in the coal-mining areas. Lower domestic production increased dependency on imports and in 2010-11, 68.9 MT of coal was imported.

11.38 The government had earlier approved formation of a special purpose vehicle (SPV), namely International Coal Ventures Limited (ICVL), with the participation of PSUs for acquisition of coal resources abroad. ICVL is also actively pursuing acquisition of coal assets in Australia and Indonesia. Proposals received from several countries are being reviewed and due diligence is being practised. ICVL is also participating in the bidding process for acquisition of equity in some undeveloped coal assets. However, no acquisition has so far been

made. For increasing the output of washed coking and non-coking coal, Coal India Limited (CIL) has envisaged setting up of 20 new coal washeries for an ultimate raw coal throughput capacity of 111.10 MT per annum with an estimated capital investment of about Rs. 2,500 crore. These include seven coking coal washeries and 13 non-coking coal washeries.

11.39 Coal is largely sold through a notified price. An e-auction scheme has, however, been launched. Under e-auction, during 2010-11, CIL and Singareni Collieries Company Limited (SCCL) sold 45.6 MT and 2.6 MT of coal respectively. During April-December 2011, CIL offered 39.0 MT and sold 33.5 MT of coal through e-auction. The average price was 74 per cent above the notified price. Similarly during April-December 2011, SCCL offered and sold 4.1 MT of coal through e-auction, with average sale price being 113 per cent more than the notified price during the same period.

Allocation of coal blocks

11.40 So far 218 coal blocks with geological reserves of about 50,000 MT have been allocated to eligible public and private companies under the Coal Mines (Nationalization) Act 1973. Out of these, 25 coal blocks were de-allocated. Of the de-allocated blocks, two were re-allocated to eligible companies under the said Act. Thus there are 195 net allocated blocks with geological reserves of about 44,230 MT. Sector-wise, the power sector has been allocated 81 coal blocks, iron and steel 63 blocks, commercial mining 40 blocks, and cement 6 blocks.

Railways

11.41 The Ministry of Railways Vision 2020 document envisages the railway sector's share in the GDP to increase from the existing level of 1 per cent to about 3 per cent and its revenues to grow by 10 per cent annually over the next ten years. Some of the major goals set for 2020 in the document include (a) laying of 25,000 km of new lines; (b) quadrupling of the 6,000 km network with segregation of passenger and freight lines; (c) electrification of 14,000 km; (d) completion of gauge conversion; (e) upgradation of speed to 160-200 kmph for passenger trains; and (f) construction of 2,000 km of high-speed rail lines.

Freight Performance of the Indian Railways

11.42 Freight loading on Indian Railways during April-November 2011 was 618.0 MT as compared to 593.4 MT in April-November 2010, an increase of 4.14 per cent (Table 11.8). This was short of the proportionate target of 644.6 MT by 26.6 MT. The low growth was primarily on account of relatively slow growth in core sectors of the economy. This was further compounded by negative growth in iron ore after the imposition of a ban on export of iron ore in Karnataka and the procedural problems in obtaining clearance from state governments.

Rationalization of Railway Freight and Passenger Fare

11.43 There was no structural change in passenger fares and freight tariff during 2011-12. However, the rates of busy season charges and development surcharge were marginally enhanced with effect from 15 October 2011. While the busy season charge in the case of coal and coke was revised from 5 per cent to 10 per cent, in the case of other commodities it was increased from 7 per cent to 10 per cent. The rate of levy of development surcharge was revised from 2 per cent to 5 per cent in the case of all traffic.

Rail Safety

11.44 Safety is the prime concern of Indian Railways and all possible steps are undertaken on a continual basis to prevent accidents and enhance safety. As a result, the number of consequential train accidents including cases of trespassing at unmanned level crossings came down from 415 in 2001-2 to 141 in 2010-11. A High Level Safety Review Committee was constituted on 16 September 2011 under the chairmanship of Dr Anil Kakodkar, former Chairman, Atomic Energy Commission and Secretary, Department of Atomic Energy, to look into all technical and technology-related aspects in connection with safe running of train services in the country.

11.45 In order to increase efficiency and enhance safety in train operations, electrical/electronic interlocking along with the multi-aspect colour light signalling system in replacement of the outdated mechanical/ multi cabin system was provided at 154 stations during April-November, 2011. To improve reliability and visibility of signals, outdated filament-type signals were replaced with durable light emitting diode (LED) signals at 245 stations during April-November, 2011. In addition 329 stations were provided with data loggers during this period. Automatic clearance of block sections was also provided at 275 sections through axle counters during April-November, 2011. These initiatives are

Table 11.8 : Performance of Indian Railways.

Particulars	2009-10*	2010-11*	(April – November) 2010-11*	2011-12*(prov.)	Change (per cent) 2010-11	2011-12
1. Total revenue earning freight traffic (MT)	887.8	921.7	593.4	618.0	3.8	4.1
i) Coal	396.2	420.4	270.4	288.5	6.1	6.7
ii) Raw materials for steel plants (except iron ore)	11.6	13.3	8.3	9.4	14.7	12.4
iii) Pig iron & finished steel						
i) from steel plants	24.2	24.1	16.0	17.0	-0.5	6.4
ii) from other points	7.7	8.8	4.6	4.8	14.1	4.6
iii) Total	31.9	32.8	20.6	21.8	3.0	6.0
iv) Iron ore						
i) for export	43.6	25.7	17.2	8.8	-41.2	-48.9
ii) for steel plants	44.3	44.7	28.7	34.0	0.8	18.2
iii) for other domestic users	44.8	48.1	30.6	27.0	7.4	-11.7
iv) Total	132.7	118.5	76.5	69.8	-10.8	-8.9
v) Cement	93.2	99.1	63.1	68.4	6.4	8.4
vi) Foodgrains	38.7	43.5	26.2	28.8	12.3	9.7
vii) Fertilizers	43.7	48.2	33.2	33.1	10.4	-0.3
viii) POL	38.9	39.3	26.4	27.2	1.1	2.9
ix) Container service						
i) Domestic containers	9.6	11.0	6.7	5.9	14.3	-11.1
ii) EXIM containers	25.3	26.6	17.7	18.8	5.0	6.4
iii) Total	35.0	37.6	24.4	24.8	7.6	1.6
x) Balance (other goods)	66.1	69.2	44.4	46.4	4.6	4.6
2. Net tonne km (billion)	600.6	625.7	393.1	410.4	4.2	4.4
3. Net tonne km/wagon/day (BG)@	9022.0	9247.0	8844.0	9081.0	2.5	2.7
4. Passenger traffic org. (million)	7245.8e	7651.1e	5243.9$	5518.6$	5.6	5.2
5. Passenger km (billion)	903.5	978.5	668.0	711.0	8.3	6.4

Source **: Ministry of Railways.**

Notes : POL stands for petroleum, oil and lubricants; EXIM is export-import;

***- Excluding Konkan Railway loading; e - Excluding Metro Kolkata;**

@- Calculated in terms of 8 wheelers;

$- Including Metro Kolkata, BG- Broad Gauge

expected to reduce dependence on the human element and enhance safety. Six anti-collision devices (ACD) works have been sanctioned on Eastern, East Central, East Coast, South Eastern, Southern, and South Central Railways covering 6,750 route km.

Upgradation of passenger amenities

11.46 In order to upgrade passenger amenities, 845 stations have so far been selected for development as Adarsh stations. Till December 2011 450 Adarsh stations had been completed with basic facilities such as drinking water, adequate toilets, catering services, waiting rooms and dormitories especially for lady passengers. The computerized passenger reservation system (PRS) of Indian Railways is the largest passenger reservation network in the world, available at 2,829 locations. On an average 4.44 crore passengers per month are booked through PRS

network with an average earning of ₹ 1,823.75 crore per month. Indian Railways has tied up with India Post for providing the PRS facility through post offices and it is currently functional at 149 such post offices.

11.47 The Computerized unreserved ticketing system (UTS) is available at 5,121 locations with over 9,000 counters provided until end November 2011. Automatic ticket vending machines have also been installed at 630 locations. The freight operations information system (FOIS) implemented at 263 locations, covers all major yards/lobbies and control offices at divisions and zones. Further, as a major passenger-friendly move, Indian Railways opened the first phase of the real train information system (RTIS) in October 2011 to public for accurate train tracking, thus heralding a new era of application of advanced communication and information technologies in various Railway-related activities.

Development of Multifunctional Complex (MFC)

11.48 A new concept of development of MFCs with budget hotels was introduced in the Rail Budget 2009-10, so that important facilities may be available to rail users in a separate complex in the vicinity of the circulating area on station premises. A total of 198 stations have been identified since 2009-10 (67 in 2009-10, 93 in 2010-11, and 38 in 2011-12) for development of MFCs. The task of development has been assigned to zonal Railways and various executing agencies under the Ministry of Railways. So far 22 MFCs have been completed. The process of leasing/ licensing of these MFCs is presently under way.

Modernization of Indian Railways

11.49 In a major move to give further impetus to Railways' modernization plans, an Expert Group has been constituted under the Chairmanship of Shri Sam Pitroda to recommend ways and means of meeting the challenges of economic growth, the aspirations of the common man, the needs of changing technology, and the expanding market, while at the same time ensuring adequate focus on addressing the social and strategic requirements of the country consistent with Indian Railways' national aspirations. The terms of reference of the Group involve outlining strategies for modernization of Railways with focus on track, signalling, rolling stock, stations and terminals upgradation; using ICT for improving efficiency and safety; augmenting existing capacities of Railways through indigenous development; reviewing projects; and addressing PPP issues. The Expert Group is expected to submit its report by 31 March 2012.

Dedicated Freight Corridor (DFC) Project

11.50 The DFC Project envisaging a Western DFC (1,499 km) from Mumbai to Rewari/Dadri to cater largely to the container transport requirement and an Eastern DFC (1,839 km) from Dankuni to Ludhiana, largely to serve coal and steel traffic is being implemented by the Dedicated Freight Corridor Corporation of India Ltd. (DFCCIL), a PSU under the Ministry of Railways. The project is being implemented through a mix of bilateral/ multilateral debt, budgetary support, and PPP, with a debt equity ratio of 2:1. Major portions of Western Corridor are being funded with Japanese assistance and Eastern Corridor with World Bank assistance. Construction work has commenced in both the corridors. The corridors are targeted for completion in the terminal year of the Twelfth Plan. With the commissioning of the Eastern and Western DFCs, capacity on existing Eastern and Western Indian Railways routes would be released for smoother flow of passenger traffic.

11.51 It is planned to upgrade the speed of passenger trains to 160-200 kmph on these existing routes. A pre-feasibility study for upgradation of speed of passenger trains to 160-200 kmph on the existing Delhi-Mumbai route is being undertaken by the Government of Japan in 2011-12. The Government of Japan will undertake the feasibility study of this route in 2012-13. Further, preliminary engineering-cum-traffic survey work has been awarded for the four future DFCs, namely North-South Corridor (Delhi-Chennai), East-West Corridor (Kolkata-Mumbai), East Coast Corridor (Kharagpur-Vijayawada), and Southern Corridor (Chennai-Goa).

Railway Electrification

11.52 The target for electrification during the Eleventh Five Year Plan was revised in the Mid Term Review from 3,500 to 4,500 route kilometres (RKM). In the first four years of the Plan, 3,391 RKM has been electrified with an expenditure of ₹ 2,621 crore. During 2011-12, a target of 1,110 RKM with an outlay of ₹ 978 crore has been

kept. During April-November 2011, 288 RKM has been electrified. To optimize the operational expenditure by obtaining electricity at economical tariffs, Indian Railways plans to set up its own captive thermal power plants. Railways, in partnership with the National Thermal Power Corporation (NTPC), is setting up 1000 MW and 1320 MW thermal power plants at Nabinagar in Bihar and at Adra in Purulia district of West Bengal respecively. Another captive power plant of 700 MW capacity at Thakurli, Maharashtra, has also been planned.

Policy Initiatives for attracting private capital

11.53 In order to attract private capital for accelerated construction of fixed rail infrastructure, the Ministry of Railways has formulated PPP investment models for its existing shelf of projects and new projects. The Ministry is in the process of finalizing a comprehensive draft policy containing six models for specific categories of projects. Once finalized, the policy would replace the existing Railways Infrastructure for Industry Initiative (R3i) and Railways Policy for Connectivity to Coal and Iron Ore Mines (R2CI) policies for private investments in rail connectivity projects.

Roads

National Highways Development Project (NHDP)

11.54 About 22 per cent of the total length of National Highways (NHs) is single lane/ intermediate lane, about 53 per cent is two lane standard, and the balance 25 per cent is four lane standard or more. In 2011-12, the achievement under various phases of the NHDP up to December, 2011 has been about 1,250 km and projects have been awarded for a total length of about 4,374.9 km. The status of the NHDP as on December 2011 is given in Table 11.9.

Financing of the NHDP

11.55 A part of the fuel cess imposed on petrol and diesel is allocated to the NHAI for funding the implementation of the NHDP. The NHAI leverages the cess flow to borrow additional funds from the debt market. Till date, such borrowings have been limited to funds raised through 54 EC (capital gains tax exemption) bonds and the short-term overdraft facility. Government has also taken loans for financing projects under the NHDP from the World bank (US$ 1,965 million), Asian Development Bank (US$,1605 million) and Japan Bank for International Cooperation (32,060 million yen) which are passed

Table 11.9 : NHDP Projects as on December 2011

Sl. No.	NHDP components	Total Length km)	Completed 4/6 Lane (km)	Under implementation		Balance for Award of Civil Work (km)
				Length (km)	No. of Contracts	
1	GQ	5846	5831	15	8	-
2	NS-EW	7142	5914	803	76	420
3	Port connectivity	380	341	39	4	-
4	Other NHs	1390	946	424	5	20
5	SARDP-NE	388	5	107	2	276
6	NHDP Phase III	12,109	3024	6514	90	2572
7	NHDP Phase IV	20,000	-	2549	18	17,451
8	NHDP Phase V	6500	709	2768	22	3023
9	NHDP Phase VI	1000	-	-	-	1000
10	NHDP Phase VII	700	7	41	2	659
	Total	**55,455**	**16777**	**13265**	**227**	**25,421**

Source **: Ministry of Road Transport and Highways (MoRT&H).**

Notes: GQ—Golden Quadrilateral connecting Delhi, Mumbai, Chennai, and Kolkata; NS-EW—North-South and East-West corridor; SARDP-NE—Special Accelerated Road Development Programme in the North-Eastern Region.

Table 11.10 : Financial Structure of the NHAI

(₹ crore)

Year	Cess Fund	External Assistance		Borrow-ings 54-EC Bonds	Budge tary Support
		Grant	Loan		
2005-6	3269.70	2350.00	600.00	1289.00	802.00
2006-7	6407.45	1582.50	395.50	1500.00	570.67
2007-8	6541.06	1776.00	444.00	305.18	559.00
2008-09	6972.47	1515.00	378.80	1630.74	159.00
2009-10	7404.70	272.00	68.00	1153.63	200.00
2010-11	8440.94	320.00	80.00	2138.10	843.00
2011-12*	6187.00	-	-	1531.35	570.01

***Source*: MoRTH. Note: * up to December 2011.**

on to the NHAI partly in the form of grants and partly as loan. The NHAI has also availed a direct loan of US$ 149.78 million from the ADB for the Manor Expressway Project (Table 11.10).

Special Accelerated Road Development Programme for North-East region (SARDP-NE)

11.56 The SARDP-NE aims at improving road connectivity to state capitals, district headquarters, and remote places of the north-east region. It envisages two /four laning of about 4,798 km of NHs and two laning/ improvement of about 5,343 km of state roads. This will ensure connectivity of 88 district headquarters in the north-eastern states through two-lane NHs / two-lane state roads. The programme has been divided into Phase A and Phase B and the Arunachal Pradesh package of Roads & Highways.

11.57 With the approval of the Cabinet Committee on Infrastructure (CCI) on 8 April 2010 for transfer/ addition of 1,503 km roads to Phase A of the SARDP-NE, Phase A now consists of improvement of 4,099 km of roads consisting of 2,041 km of NHs and 2,058 km of state roads at an estimated cost of ₹ 21,769 crore. Out of the 4,099 km, the Border Roads Organisation (BRO) and state PWDs have been assigned the development of 3,213 km. The remaining length of 886 km will be built by the NHAI, Ministry / Arunachal Pradesh PWD, and BRO after investment approval is received from the CCI. Out of the 3,213 km, projects covering a length of 2,271 km have been approved till December 2011. All these works are in different stages of progress. Phase B has now been modified to cover two laning of 1,285 km of NHs. Further approval for preparation of detailed project reports (DPR) for two laning / improvement of 2,438 km of state roads has also been given. Till December 2011, a DPR was prepared for 450 km road length.

11.58 The Arunachal Package covering 2,319 km stretch of road was approved by the government as part of the SARDP-NE on 9 January 2009. Of this, 776 km has been approved for execution on build operate transfer (BOT) (annuity) basis and the remaining for tendering on engineering procurement construction (EPC) basis. Three projects under BOT (annuity) for 369 km length have been awarded and the award for the remaining two projects covering 407 km is under process. For other stretches to be taken up on EPC basis, estimates have been sanctioned / DPR is under process.

Initiatives for development of the entire NH network to minimum acceptable two-lane standards

11.59 The Eleventh Plan had envisaged accelerated efforts to bring the NH network up to a minimum two-lane standard by the end of the Twelfth Plan and for removing existing deficiencies. The MoRTH has proposed a World Bank loan and budgetary allocations to reach this goal by December 2014. Consultants have been engaged for preparation of a DPR for about 3,800 km road length proposed to be developed under World Bank assistance. The MoRTH has also initiated action for improvement of the remaining 2,500 km of single- intermediate-lane NHs through budgetary resources. In order to make a visible impact, the work would be taken up for upgradation on a corridor concept. These corridors would include strengthening (in adjoining reaches) in addition to widening to two-lane/two-lane with paved shoulder standards in order to have better facility over long continuous stretches.

11.60 In general, the larger stretches costing more than ₹ 150 crore have been taken up with loan assistance from the World Bank under the National Highways Interconnectivity Improvement Programme (NHIIP). The smaller stretches costing less than ₹ 150 crore have been taken up through budgetary support. In this category, a 2,200 km length (50 projects) with an estimated cost of ₹ 6,000 crore has been taken up. DPRs are prepared by state PWDs and the estimates are directly submitted by them to the MoRTH for sanction. 34 projects with a length of 1,564 km costing ₹ 4,196.14 crore has been sanctioned under the NH(O). Projects with a

length of 1,516 km amounting to ₹ 4,071.64 crore have already been awarded. The remaining projects are at tender stage.

Development of roads in Left Wing Extremism (LWE)-affected areas

11.61 The government on 26 February 2009 approved the Road Requirement Plan (RRP) for development of 1,126 km NHs and 4,351 km state roads (total 5,477 km) to two-lane at a cost of ₹ 7,300 crore in 34 LWE-affected districts in the states of Andhra Pradesh, Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Maharashtra, Odisha, and Uttar Pradesh. The MoRT&H has been entrusted with the responsibility of developing roads in LWE-affected areas of the country. Implementation of the programme has been taken up through respective state public works departments (PWDs). As of now detailed estimates for 5,339 km length have been sanctioned at an estimated cost of ₹ 7,273 crore, out of which works on 4,288 km length costing ₹ 5,390 crore have been awarded. Development in 848 km length has been completed up to December 2011 and cumulative expenditure incurred so far is ₹ 1,363 crore.

11.62 For strengthening, RRP II consisting of 370 works covering a length of 8,014 km costing ₹ 10,700 crore has also been finalized by the Ministry of Home Affairs. The process for approval of RRP II has been initiated by this Ministry. On 4 November 2010, government approved 600 km of state roads in Odisha out of the 1,632 km long LWE-affected Vijayawada-Ranchi route, at a cost of ₹ 1200 crore. This road is not covered under any central or state scheme. The total length has been divided into seven packages based on the location of stretches, status of land acquisition, and preparation of the DPRs. So far detailed estimates for 451 km length have been sanctioned at an estimated cost of ₹ 828 crore, out of which, works on 199 km length costing ₹ 337 crore have been awarded. Cumulative expenditure incurred up to December 2011 is ₹ 42 crore.

Prime Minister's Reconstruction Plan (PMRP) for Jammu and Kashmir

11.63 The Prime Minister announced a Reconstruction Plan (PMRP) for Jammu and Kashmir during his visit to the state on 17 and 18 November 2004. The Plan incorporates a total seven works amounting to approximately ₹ 3300 crore, namely construction of Mughal Road, widening of Domel-Katra road (NH1C), double laning of Batote-Kishtwar-Sinthanpass-Anantnag Road (NH1B), upgrading of Srinagar-Uri Road (NH1A), construction of Khanabal-Pahalgam Road, construction of Narbal-Tangmarg Road and double laning of Srinagar-Kargil-Leh Road (NH1D). Till now, an expenditure of around ₹ 2,300 crore has been incurred on the PMRP. Further, ₹ 243 crore has been allocated for Jammu and Kashmir for the works being executed on national highways through the BRO. For the works on the state and other district roads (ODR) under Central Road Fund (CRF) and Inter State Connectivity /Economic importance (ISC/EI) ₹ 121 crore has been allocated.

Construction of rural roads under the Pradhan Mantri Gram Sadak Yojna (PMGSY)

11.64 The PMGSY was launched to provide single all-weather road connectivity to eligible unconnected habitations having population of 500 persons and above in plain areas and 250 persons and above in hill states, tribal (Schedule V) areas, desert (as identified in the Desert Development Programme) areas, and LWE-affected districts as identified by the Ministry of Home Affairs. Under the programme, up to January 2012, about 4.41 lakh km roads to benefit 1,14,433 habitations have been cleared with an estimated cost of ₹ 1, 26,937 crore . A sum of ₹ 96,952 crore has been released to the states/ union territories (UTs) and about ₹ 88,931 crore has been spent. So far 3,41,257 km road length has been completed and new connectivity has been provided to over 82,019 habitations. Work on a road length of about 98,399 km is on full swing.

11.65 Rural roads has also been identified as one of the six components of Bharat Nirman which has the goal of providing all-weather road connectivity to all villages with a population of 1,000 (500 in the case of hilly or tribal areas). Bharat Nirman proposes to provide new connectivity to a total of 54,648 habitations, involving construction of 1, 46,184 km of rural roads. In addition to new connectivity, Bharat Nirman envisages upgradation/renewal of 1, 94,130 km of existing rural roads. Under the rural roads component of Bharat Nirman, 42,531 habitations have been provided all-weather road connectivity up to January 2012 and projects for connecting 15,856 habitations are at different stages. During 2011-12 (Apr.-Jan.), over 15,566 km all-weather road has been completed under the programme. This has provided connectivity to 2,579 habitations at an expenditure of ₹ 8,380 crore.

Civil Aviation

Air passenger and cargo traffic

11.66 Air traffic in India continues to register significantly higher rates of growth averaging 18.5 per cent in the last seven years. Domestic passenger traffic handled at Indian airports reached 108.1 million during January-November 2011 from a level of 90.5 million in the corresponding period in the previous year registering a growth of 19.4 per cent. International passenger traffic and cargo handled at Indian airports grew by 7.7 per cent during January-November 2011 and was placed at 33.6 million passengers and 1.4 MMT of cargo. Domestic cargo throughput during January-November 2011 stood at 0.75 MMT, the same level as in the previous year.

Airport Infrastructure

11.67 In 2011, airport infrastructure development continued at a significant pace. Upgradation of Kolkata and Chennai airports, including construction of new terminals, is at an advanced stage of completion. In another 18 non-metro airports, various upgradation works like expansion of terminal buildings, aprons, taxiways, and aerobridges have been taken up. For improving air navigation services, the Airport Authority of India (AAI) installed the new ATS automation system at Chennai. The Government approved a one-time grant-in-aid of ₹ 378.0 crore to the AAI for the Final Operation Phase of GPS Aided GEO Augmented Navigation (GAGAN) project. At IGI Airport, Delhi, upgradation of the existing cargo terminal and construction of a Greenfield cargo terminal have been undertaken. At Mumbai Airport, apart from the airport development project under way, upgradation of runway 09/27 was completed. In order to meet the requirements of increasing traffic, work relating to expansion of the terminal building and apron was undertaken at Bangalore International airport. Government also gave 'in-principle' approval for setting up of a greenfield airport at Karaikal in Puducherry and Shirdi in Maharashtra.

New Initiatives

11.68 In order to address issues concerning viability of the civil aviation sector, particularly the airline industry, a Working Group was constituted on 12 December 2011 under the chairmanship of the Secretary civil aviation. This Group has recommended that state governments rationalize the value added tax (VAT) on aviation turbine fuel (ATF), foreign airlines be permitted to invest in domestic airlines undertakings, and direct import of ATF by airlines for their own consumption be allowed. The Working Group also decided that airlines should be asked to prepare their turnaround plans, which would be examined by the concerned departments of the government separately for each airline. Another recommendation was that fare structure should be reviewed by airlines so as to cover the cost of their operations. The Working Group also decided that an economic regulatory framework may be formulated with regard to excessive/predatory pricing by 31 May 2012.

Telecommunications

11.69 The Indian telecom sector has witnessed tremendous growth over the past decade. Today, the Indian telecom network is the second largest in the world after China. A liberal policy regime and involvement of the private sector have played an important role in transforming this sector. The total number of telephones has increased from 429.73 million on 31st March 2009 to 926.55 million on 31st December 2011(Table 11.11).

11.70 The growth of wireless connections has been phenomenal, reaching 893.86 million connections at the end of December 2011. As a result, the share of wireless telephones has increased from 80.3 per cent in March 2007 to 96.4 per cent in December 2011. However, the growth of wire line connections has been decreasing every year. Improved affordability of wireless phones has made the universal access objective more feasible. The liberalization efforts of the government are evident in the growing share of the private sector in total telephone connections. As against a meagre 5 per cent in 1999, the share of private operators has increased to 86 per cent in December 2011. A competitive stimulus provided by a liberal policy

Table 11. 11 : Telephone connections

(in millions)

	March 2009	March 2010	March 2011	Dec. 2011
Wireline	37.96	39.96	34.73	32.69
Wireless	391.76	584.32	811.60	893.86
Gross total	429.73	621.28	846.33	926.55
Annual growth (%)	43.0	44.6	36.2	9.48

***Source*: Department of Telecommunications.**

regime has increased telecom penetration together with a substantial reduction in tariffs.

11.71 Teledensity is an important indicator of telecom penetration in the country. Teledensity has increased from 18.2 per cent in March 2007 to 76.86 per cent in December 2011. Teledensity varies across circles and there is significant urban-rural divide. While urban teledensity reached 167.4 per cent at the end of December 2011, rural teledensity was only 37.5 per cent. At circle levels also, while some circles such as Delhi (235.6 per cent), Mumbai (188.95 per cent), Kolkata (168.45 per cent), Chennai (170.18 per cent), and Himachal Pradesh (118.63 per cent) have high teledensity, in some circles such as Bihar (47.17 per cent) and Assam (45.85 per cent), it is very low. Steps have been undertaken to improve teledensity, particularly in rural areas.

11.72 Recognizing the potential of broadband services in growth of GDP and in creation of an enabling environment for promoting a knowledge-based society, government had announced a broadband policy in 2004. Several measures have since been taken to promote broadband usage in the country. As a result, there were 13.30 million broadband subscribers as on 31 December 2011 and 20.99 million internet subscribers at the end of March 2011. However, broadband has lagged behind the growth of telephones in India. Special efforts are being made to increase its penetration, especially in rural and remote areas.

11.73 The Universal Service Obligation Fund (USOF) was established with the fundamental objective of providing people in rural and remote areas access to 'basic' telephony services at affordable prices. Subsequently its scope was widened to provide subsidy support for enabling access to all types of telephony services including mobile services and broadband connectivity and for creation of infrastructure like optical fibre cables (OFC) in rural and remote areas. Various schemes under implementation for taking communication facilities to rural and remote areas with the support of the USO fund are as follows:

- In all 5,79,889 villages, i.e. about 97.69 per cent of the Census 2001 inhabited revenue villages, have been covered with village public telephone (VPT) facility as on 31st December 2011. VPT facility is likely to be provided in the remaining inhabited revenue villages by August 2012.
- Setting up and managing of 7,353 infrastructure towers in 500 districts spread over 27 states for provision of mobile services in specified rural and remote areas is being done. Till December 2011, 7,296 of them (99 per cent) had been set up.
- In order to provide broadband connectivity to rural areas, the USOF signed an agreement with Bharat Sanchar Nigam Limited (BSNL) on 20 January 2009 to provide 8,88,832 wire-line broadband connections to individual users and government institutions and set up 28,672 kiosks over a period of five years. As on 31st December 2011, 3,38,617 broadband connections and 6426 kiosks had been provided under this scheme in rural and remote areas.
- Another scheme has been launched under the USOF to provide sufficient back-haul capacity to integrate voice and data traffic from the access network in rural areas to their core network by strengthening the OFC network. This scheme considers OFC network augmentation between the block headquarters and District headquarters to begin with. The USOF, through this scheme, shall provide subsidy support for augmentation, creation, and management of intra-district OFC network on the condition that it will be shared with other telecom operators at the rates prescribed in the agreement. Assam has been taken up first for implementation.
- Recognizing the vital role that information communication technology (ICT) can play in the empowerment of rural women, a scheme called Sanchar Shakti has been launched in March 2011 for pilot projects aimed at facilitating access of self-help groups (SHGs) to ICT-enabled services. Financial support from the USO Fund is to be provided towards value added services (VAS) subscriptions for SHGs in accordance with the provisions of underlying subsidy agreements. At present memorandums of understanding (MoUs) have been signed for proof of concept (PoC) for nine mobile VAS projects in the states of Tamil Nadu, Kerala, Maharashtra, Uttar Pradesh, Uttarakhand, Andhra Pradesh, Rajasthan, and the Union Territory of Puducherry.

Other Major Initiatives

11.74 Government has approved a project for a national optical fibre network in October 2011 for providing broadband connectivity to all 2.5 lakh gram panchayats at a cost of ₹ 20,000 crore. The network

will provide connectivity to various public institutions like gram panchayats, primary health centres (PHCs), and schools in rural areas. It will also result in investment from the private sector both for providing different services and for manufacturing of broadband-related telecom equipment. The project will be funded by the USOF. The third-generation (3G) and broadband wireless access (BWA) auctions that took place last year are expected to act as catalysts for enabling internet access to even the remotest parts of India and further boost the use of mobile broadband and mobile data as well as applications. The upcoming decade will usher in an information era through mobile value added services (MVAS) and 'broadband for all'.

Manufacturing of Telecom Equipment

11.75 The government is supporting the domestic equipment manufacturing industry and growth of indigenous technology. In partnership with industry, it is building a conducive ecosystem to boost the equipment-manufacturing sector that can compete with the best in the world. With the above initiatives India is expected to be a manufacturing hub for telecom equipment. To promote indigenous research and development (R&D) and manufacturing to become self-reliant in the telecom/ICT equipment manufacturing sector, various strategies have been proposed in the Draft National Telecom Policy (see Box 11.1). In order to ensure focused indigenous development in the telecom sector, efforts would be concentrated in a definite policy direction by creating a suitable roadmap for aligning technology, demand, standards, and regulations after considered evaluation of candidate technologies and emerging trends. It is proposed to set up a fund for promoting indigenous R&D, intellectual property rights (IPR) creation, manufacturing and deployment of state-of-the-art telecom products. Emphasis will be given to creation of Indian IPRs which go into international standards as well as to product manufacturing in implementation of major programmes and projects as a vehicle for developing Brand India.

Ports

Cargo Traffic at Indian Ports

11.76 During April-September 2011, major and non-major ports in India handled a total cargo throughput of 446.1 MT reflecting an increase of 4.6 per cent over the same period last year. The rate of growth of cargo handled at 12 major ports improved from

Box 11.1 : Draft National Telecom Policy (NTP)

The Government is in the process of finalizing the new National Telecom Policy. Draft of the policy was circulated in 2011 for consultation with various stake holders. Views/Comments from these stake holders have been received and the same are under consideration. NTP is likely to be in place by June 2012. The Draft NTP proposes to provide a stable, rational, and objective policy regime over the next decade or so and contains the following salient features:

- To make available secure, reliable and affordable voice telephony and high speed broadband services to every citizen in India with special focus on rural and remote areas.
- To improve the broadband experience by enhancing the speed of delivery.
- To make India a global hub of manufacturing for all electronic products including telecom equipment with substantial value addition with in the country and safeguard security concerns of the nation.
- For simplification and rationalisation of licensing regime, transparent system for allocation of spectrum and enable efficient usage of spectrum.
- For discovery of price of spectrum through market related processes.
- To achieve One Nation- Full Mobile Number Portability.
- To enable free roaming throughout the country.
- To harness full potential of mobile phones for enabling provision of citizen centric services related to education, health, employment, agriculture, entertainment, banking & insurance services, skil upgradation, vocational training etc.
- To encourage indigenous manufacture of cost effective mobile devices.
- The faster roll out of high speed and reliable broadband in rural and urban areas will enable decentralised governance, participative democracy and delivery of basic services such as health and education to every citizen of the country. The thrust on manufacturing will promote entrepreneurship, create more job opportunities, reduce imports and improve security. Efficient usage of scarce resources like spectrum will result in better quality of service to the customers at affordable cost.
- The new policy regime will be beneficial to end consumers/citizens, Telecom Service Providers, Value Added Service Providers, Government and Manufacturers.

1.2 per cent in April-September 2010 to 3.1 per cent in April-September 2011. There was, however, a deceleration in growth of cargo handled at non-major ports, from 22.2 per cent in April-September 2010 to 7.2 per cent in April-September 2011. Out of 12 major ports, growth in cargo throughput at Ennore port was the highest at 39.5 per cent, followed by Tuticorin (13.7 per cent) and Visakhapatnam (10.9 per cent). Other major ports that clocked positive growth in the 5-10 per cent range were Cochin, Paradip, and New Mangalore. In contrast, three major ports, Chennai (-8.2 per cent) on the East coast and Mormugao (-7.8 per cent) and Mumbai (-2.6 per cent) on the West Coast showed contraction in cargo throughput.

Commodity-wise Cargo Traffic at Major Ports

11.77 Energy imports consisting of POL and coal constituted 47 per cent of the total cargo traffic at major ports during the first half of 2011-12. In terms of commodity-wise traffic at 12 major ports, growth in cargo at major ports during the first half of 2011-12 was driven by increase in four broad categories, namely 18.5 per cent in thermal coal, 11.4 per cent in fertilizer raw material, 8.4 per cent in containers, and 7.3 per cent in other cargo. Iron ore and finished fertilizers witnessed a contraction by 4.4 MT and 2.9 MT respectively. During April-September 2011, total Container traffic at major ports increased both in terms of tonnage and twenty foot equivalent units [TEUs] by 8.4 per cent and 5.2 per cent respectively. Jawahar Lal Nehru Port (JNPT) continued to be the leading container-handling port in the country with a share of about 48 per cent in terms of tonnage and more than 55 per cent in terms of TEUs in the total container traffic at major ports

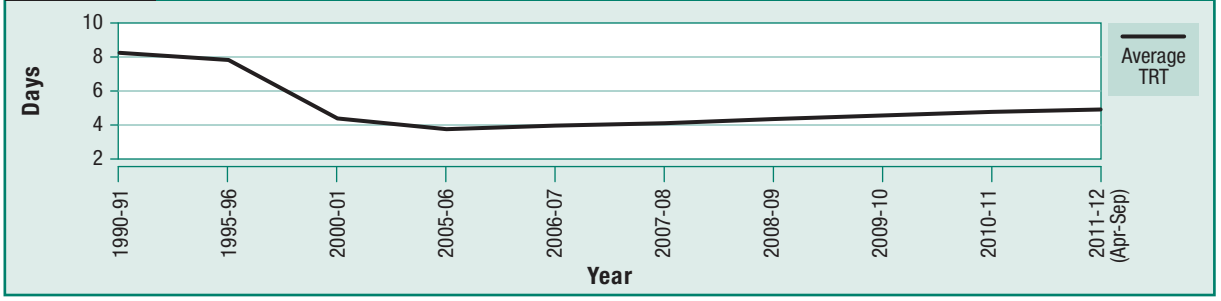
Cargo Traffic at Non - major Ports

11.78 During the first four years (2007-11) of the Eleventh Five Year Plan, traffic at non-major ports increased at an annual average rate of close to 14.5 per cent. The growth, however, moderated to 7.2 per cent in the first half of 2011-12 but it remained significantly above the growth of major ports. Non-major ports handled more than 37 per cent of total maritime freight traffic of the country during April-September 2011. The growth in cargo handled at non-major ports has been facilitated by sustained growth in non-major ports located in Maharashtra and Gujarat aided by substantial increase in the cargo traffic of coal, building material, and fertilizers. The growing importance of non-major ports in handling cargo traffic has helped alleviate the congestion at major ports. Gujarat accounted for more than three-fourths of the total traffic handled by non-major ports followed by Andhra Pradesh (13 per cent), Maharashtra (5 per cent), and Goa (3 per cent). Four maritime states, namely Gujarat, Maharashtra, Goa, and Andhra Pradesh together accounted for close to 97 per cent of the total cargo traffic handled by the non-major ports in the current year.

Port Efficiency

11.79 Efficiency at ports has an important bearing on the transaction cost of shipping lines. Major ports have improved their efficiency of operations, particularly in terms of turnaround time (TRT). TRT is the total time spent by a ship at the port from its entry until its departure. Average TRT for all major ports improved from 8.10 days in 1990-1 to 4.63 days in 2009-10. During 2010-11, the TRT ranged between 2.20 days at Cochin port to 7.73 at Paradip. Amongst the 12 major ports, improvement in TRT during 2010-11 in comparison to 2009-10 was discernible in the cases of Kolkata Dock System and Haldia Dock Complex at Kolkata port, Paradip, and New Mangalore. Improvement in average TRT at major ports for select years since 1990-1 to 2010-11 is presented in the Figure 11.2 .

Figure 11.2 Major ports: Average TRT



Eleventh Five Year Plan target

11.80 The Eleventh Five Year Plan envisaged an increase in capacity of major port to 1,016.55 MT by the end of 2011-12 from the pre-Plan base level of 504.75 MT. Average annual growth in capacity addition was envisaged at 15 per cent. Actual capacity addition in first three years of the Plan, however, was moderate and showed a growth of 7.3 per cent per annum. Cargo-handling capacity at major ports at the end of March 2011, therefore, increased to 670.1 MT.

Maritime Agenda 2010-2020

11.81 In the Maritime Agenda 2010-20, a target of 3,130 MT port capacity has been set for the year 2020. More than 50 per cent of this capacity is to be created in the non-major ports as the traffic handled by these ports is expected to increase to 1,280 MT. The objective of the Maritime Agenda is not only creating more capacity but setting up ports on a par with the best international ports in terms of performance. This enlarged scale of operation is expected to reduce transaction costs considerably and make Indian ports globally competitive. The total proposed investment in major and non-major ports by 2020 is expected to be around ₹ 2,96,000 crore (including 72 ongoing projects worth around ₹ 18,000 crore). Most of this investment has to come from the private sector including foreign direct investment (FDI). FDI up to 100 per cent under the automatic route is permitted for construction and maintenance of ports. Private-sector participation will not only increase investment in the ports infrastructure, it is expected to improve operations of the ports through the induction of the latest technology and better management practices. Public funds will be mainly deployed for common use infrastructure facilities like deepening of port channels, rail and road connectivity from ports to hinterland, etc.

Private-sector Participation

11.82 Maritime Agenda 2010-20 has estimated that investment required in new projects of major ports will be Rs1,09,449.4 crore, of which Rs72,878.2 crore is expected to come from private-sector participation and the balance ₹ 36,571.2 crore to be funded through internal and extra budgetary resources (IEBR) and government budgetary support. States have also identified projects for development of non-major ports at an estimated cost of ₹ 1,67,930.8 crore for creation of additional capacity of 1293.6 MT. The private sector is envisaged to fund most of the projects through PPP or on BOT or build operate own transfer (BOOT) basis. It is envisaged that private sector will meet 96.1 per cent of the cost of development amounting to ₹ 1,61,332.9 crore. The remaining requirement of funds is to be contributed through gross budgetary support and IEBR.

Urban Infrastructure

Urban Infrastructure and Governance

11.83 The Jawaharlal Nehru National Urban Renewal Mission (JNNURM) has been launched by the Ministry of Urban Development for a seven-year period (i.e. up to March 2012) to encourage cities to initiate steps to bring about improvements in a phased manner in existing civic service levels. The components under the sub-mission Urban Infrastructure and Governance (UIG) include urban renewal, water supply (including desalination plants), sanitation, sewerage and solid waste management, urban transport, development of heritage areas, and preservation of water bodies. Revised allocation for the UIG for the mission period is ₹ 31,500 crore. An amount of ₹ 6,423 crore (Budget Estimates--BE) has been provided for the year 2011-12. The JNNURM has also emphasized the implementation of the following three mandatory pro-poor key reforms to enhance the capacity of urban local bodies (ULBs):

- Internal earmarking within local body budgets for basic services to the urban poor
- Earmarking of at least 20-25 per cent of developed land in all housing projects (both public and private agencies) for the economically weaker sections (EWS)/ low income groups (LIG) category
- Implementation of a seven-point charter: Provision of seven basic entitlements/services

11.84 All the selected 65 cities under the UIG component of the JNNURM have prepared comprehensive city development plans (CDPs), charting out their long-term vision and goals in urban governance and development. These plans also include investment plans, with a focus on provision of city-wide urban infrastructure services such as water supply, sanitation, drainage, and provision of basic services to the urban poor. During the Mission period, highest priority has been accorded to sectors that directly benefit the common man and the urban poor, namely water supply, sanitation, and storm

water drainage. As on February 2012, more than 98 per cent of seven-years additional central assistance (ACA) allocation of ₹ 31,500 crore has been committed.

11.85 A total of 548 projects (as on 28th February 2012) has been sanctioned at an approved cost totalling ₹ 66,520.88 crore for the listed 65 mission cities across 31 states/ UTs. The ACA committed for these projects including assistance for the buses sanctioned under the second stimulus package is ₹ 30,612.10 crore. As on 28th February 2012, an amount of ₹ 17,410.88 crore has been released as ACA to various states and UTs for the projects, financing of buses, community participation funds, reimbursement of cost of CDP and DPR preparation, and e-Governance projects approved under the JNNURM. During April, 2011-February 2012, 16 projects have been approved with a project cost of ₹ 1,313.06 crore. The ACA admissible for these projects is ₹ 594.87 crore. Further, during the same period an amount of ₹ 2,969.56 crore has been released as ACA for the projects sanctioned under the JNNURM.

11.86 The JNNURM has put the reform process of ULBs on fast track. Twenty-three reforms included in the Mission envisage institutional, financial, and structural changes in the governance structure of the local bodies (LBs) to make them efficient, accountable, and transparent. The memorandum of agreement (MOA) in respect of the reforms agenda to be undertaken by states and cities has been negotiated and signed with 65 Mission cities. Further, states and ULBs have started adhering to the timelines committed for implementation of the reforms as per the MOA. As against the Sixth-year commitments, about 79 per cent of the state-level reforms and 95 per cent of the optional reforms committed have been completed. In ULB-level reforms, achievement is 67 per cent despite the complexities involved in reforms relating to property tax and user charges for basic services. Acknowledging this challenge, the government is providing support for implementing e-governance in municipalities through a separate scheme.

11.87 The JNNURM has undertaken an exercise for assessment of finances and credit-worthiness of the Mission ULBs through a process of credit rating. This is intended to trigger the process of leveraging debt for JNNURM projects and provide a platform for the ULBs and financial institutions to engage on issues related to project financing. Presently 65 ULBs in the Mission cities have been assigned final ratings that have been made public. As a follow up, surveillance rating has been initiated to affirm the rating and assess improvements undertaken. So far, 60 ULBs have undergone surveillance rating.

Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSMT)

11.88 The UIDSSMT is a sub-component of the JNNURM for development of infrastructure facilities in all towns and cities other than the 65 Mission cities covered under UIG Sub-mission of the JNNURM. For obtaining assistance under the UIDSSMT, states and ULBs need to sign MOAs committing to implementation of the reforms. Revised allocation for the JNNURM (UIDSSMT) is ₹ 11,400 crore (compared to ₹ 6,400 crore in February 2009). From its inception in December 2005 till December 2011, as many as 788 projects across 661 towns and cities at a cost of Rs13,567.55 crore have been sanctioned under the UIDSSMT. Committed ACA for the approved projects is Rs10,946.72 crore, against which ₹ 7808.13 crore has been released till 31 December 2011.

Other Urban Infrastructure Schemes and initiatives in Urban Governance

11.89 Under the pilot scheme Urban Infrastructure Development in Satellite Towns around Seven Mega-Cities, a total of eleven projects worth ₹ 422.45 crore were sanctioned for Pilkhuwa, Vasai-Vihar, Vikarabad, Sonepat, and Sanand up to December 2011. These projects will contribute towards amelioration of basic services in these towns. Further, for the north-eastern region, the North Eastern Region Urban Development Program was launched in November, 2009 with Asian Development Bank (ADB) assistance. The project aims to assist the states of Tripura, Mizoram, Sikkim, Meghalaya, and Nagaland to address challenges of urban development in their capital cities.

Urban Transport

11.90 Urban Transport is one of the key elements of urban infrastructure. As compared to private modes of transport, public transport is energy efficient and less polluting. The public transport system helps improve urban-rural linkages and access of rural /semi-urban population in the periphery to city centres for the purposes of work without proliferation of slums within and around cities. A National Urban Transport Policy (NUTP)

was laid down in 2006, with the objectives of ensuring accessible, safe, affordable, quick, comfortable, reliable, and sustainable mobility for all.

11.91 In order to provide better transport, proposals for bus rapid transit system (BRTS) were approved for Ahmedabad, Bhopal, Indore, Jaipur, Pune-Pimpri-Chinchwad, Rajkot, Surat, Vijayawada, Vishakhapatnam, and Kolkata cities under the JNNURM, covering a total length of 467.44 km at a total estimated cost of ₹ 5,211.60 crore. Admissible central financial assistance is around ₹ 2,373.26 crore. Purchase of 15,260 buses at a total cost of ₹ 4,723.97 crore has been approved under the scheme, out of which ACA admissible is ₹ 2,088.80 crore. Till December 2011, more than 12,309 modern intelligent transport system (ITS)-enabled, low-floor and semi-low-floor buses have been delivered to states/cities.

Metro Rail Projects

11.92 In order to give proper legal cover to metro projects, the Metro Railways Amendment Act 2009 was brought into effect in September 2009, providing an umbrella 'statutory' safety cover for metro rail work in all the metro cities of India. The Act has been extended to the National Capital Region, Bengaluru, Mumbai, Chennai, Hyderabad, and Jaipur metropolitan areas.

11.93 The government had approved the implementation of the Bangalore Metro Rail Project of 42.3 km length by Bangalore Metro Rail Corporation Ltd. (BMRCL). The project commenced on 20 January 2007 and is targeted for completion by 31March 2013. Government had earlier approved the implementation of the east-west metro corridor of 14.67 km length in Kolkata by Kolkata Metro Rail Corporation Ltd (KMRCL). The project is targeted for completion by 31January 2015. The Chennai Metro Rail Project of 46.5 km length by Chennai Metro Rail Ltd. (CMRL) has also been approved. The project is targeted for completion by 31 March 2015. Recently Phase III of Delhi Metro for 103.5 km at a total cost of ₹ 35,242 crore has also been approved and is targeted for completion by 2016. The metro extension to Faridabad has also been sanctioned and is targeted for completion by March 2014. In addition, metro rail projects have been taken up on PPP basis in Mumbai for Versova-Andheri-Ghatkopar (11.07 km) and Charkop to Mankhurd via Bandra (31.87 km) and in Hyderabad (71.16 km) with viability gap funding (VGF) from the Government of India.

Financing Infrastructure

Debt financing

11.94 Net bank credit to infrastructure had a healthy growth of 48.4 per cent per annum during 2006- 11, increasing from ₹ 30,286 crore during 2006-7 to ₹ 146,767 crore during 2010-11. Credit growth turned negative in the current year and at ₹ 70,155 crore, net credit to the infrastructure sector during April-December 2011 was nearly 61 per cent of the credit to this sector advanced during April-December 2010 (Table 11.12). A significant reduction in credit flow was observed for the power and telecom sectors.

11.95 The total FDI inflows into major infrastructure sectors during April-December 2011, however registered a growth of 23.6 per cent as compared to the FDI inflows during April-December 2010. Power (43.6 per cent), non-conventional energy (338 per cent) and telecommunications (49.9 per cent) were the preferred sectors for foreign investors. Other sectors, however, failed to share the buoyancy in FDI inflows (Table 11.13).

Challenges And Outlook

11.96 The key to global competitiveness of the Indian economy lies in building world class infrastructure and service delivery at competitive rates. The realization of investment targets for infrastructure during the Eleventh Plan gives hope that the financing of an even more ambitious Twelfth Plan target may be possible. Private-sector

Table 11.12 : Increment Flow of Bank Credit to Infrastructure

(₹ crore)

Period	Infra-struc-ture	Power	Tele-com	Roads	Other Infra-struc-ture
2006-7	30286	12994	1164	5352	10776
2007-8	62220	21947	18663	9429	12179
2008-9	64636	29372	12044	12584	10658
2009-10	109916	63394	9036	26509	10956
2010-11	146767	81355	41106	19000	5307
2010 (Apr.-Dec.)	115291	66500	35200	11430	2153
2011 (Apr.-Dec.)	70155	46241	9460	16513	16860

Source : Reserve Bank of India (RBI).

Table 11.13 : FDI flows to infrastructure (US$ million)

Sector	2008-09	2009-10	2010-11	April-Dec.-2010	April-Dec.-2011
Power	984.8	1,437.3	1271.77	1007.60	1447.39
Non-conventional energy	85.3	497.9	214.40	64.38	281.97
Petroleum & natural gas	412.3	272.1	556.43	541.69	196.07
Telecommunications	2558.4	2554.0	1664.50	1326.65	1988.72
Air transport *	35.2	22.6	136.00	132.60	27.50
Sea transport	50.2	284.9	300.51	298.63	100.17
Ports	493.2	65.4	10.92	10.92	0.00
Railway-related components	18.0	34.2	70.66	47.91	35.25
Total (of above)	**4637.4**	**5168.4**	**4225.19**	**3297.86**	**4077.07**

Source **: Department of Industrial Policy and Promotion.**

Notes: * Air transport including air freight. Variation in data is due to reclassification of some sectors.

participation in financing of infrastructure has also generated optimism that public funding need not necessarily be the exclusive route for infrastructure investment. A conducive environment for private-sector participation with a transparent and credible regulatory mechanism, therefore, could reduce the pressure on public-sector funding. Sectoral analysis of private-sector participation in infrastructure during the Eleventh Plan also indicates that sectors such as irrigation, railways, water supply and sanitation, ports, and power distribution have not generated the desired enthusiasm and attracted the desired level of private investment. It is, therefore, imperative to identify hurdles and weaknesses in regulatory, financing, and incentive structure (both taxation and debt) and project implementation-related issues that may be inhibiting private investment into these sectors.

11.97 There is a limited scope for large increase in domestic savings rate. There is also a mismatch between the long term fund requirements of the infrastructure sector and the bulk of savings and their intermediation with a shorter maturity span. As a result, there is a need for introducing more innovative schemes to attract large-scale investment into infrastructure. In view of the massive requirement of funds, all efforts need to be made to attract big ticket long-term investors such as strategic investors, private equity funds, pension funds, and sovereign funds. Strengthening domestic financial institutions and development of a long-term bonds market may be critical. Government has already enhanced the limit for foreign institutional investors (FIIs) to invest in corporate bonds issued by companies in the infrastructure sector, notified guidelines for infrastructure debt funds, and allowed tax benefits for investment in long-term infrastructure bonds. Besides financing, the infrastructure sector has also suffered due to a time lag in physical capacity creation and time over-runs. These not only delay availability, but through cost overruns raise pricing and affordability issues. Infrastructure costs, as these are often non-tradeables may also affect the competitiveness of economy in long run. A harmonised list of main sectors and sub-sectors of infrastructure approved by government to serve as a guide for all agencies responsible for supporting infrastructure is a welcome move.

11.98 Energy sector: One of the foremost challenges in the coming years is to meet the energy requirement. The Twelfth Plan projections made by the Planning Commission indicate that for a GDP growth rate of 9 per cent per year, energy supply has to grow at around 6.5 per cent per year. The ability to meet the energy requirement would depend upon our ability to expand domestic production in the critical sub-sectors such as petroleum, natural gas, and coal, and meeting the balance requirement through imports. Energy requirements and import dependency in critical components are expected to be as given in Table 11.14.

11.99 Reforms are necessary in the energy-pricing policy. While the overall energy prices, as reflected by the wholesale price index (2004-5=100), seem to have increased faster than the prices for all commodities, relative prices within the energy components indicate a varying trend. Prices, particularly of electricity and petroleum products,

Table 11.14 : Projected Primary Commercial Energy Requirement (MToE)

	2010-11*	2016-17@
Oil	164.32	204.80
of which imports	125.5 (76.4%)	164.8 (80.5%)
Natural Gas & LNG	57.99	87.22
Of which imports	10.99 (19%)	24.8 (28.4%)
Coal	272.86	406.78
Of which imports	54 (19.8%)	90 (22.1%)
Lignite	9.52	14.00
Hydro	10.31	14.85
Nuclear	6.86	9.14
Renewables	0.95	1.29
Total Energy	**522.81**	**738.07**
Total Imports	**190.97 (36.53%)**	**280.12 (37.95%)**

Source : Approach to the Twelfth Five Year Plan, Planning Commission.

Notes: * Provisional data;

@ On the assumption that annual demand /growth would be 6.5 per cent up to 2016-17.The figures include use of oil and gas feed stock for fertilizer and other non-energy use. MToE is million tonnes of oil equivalent.

under the administered price mechanism have recorded much lower relative growth as can be seen from Table 11.15.

11.100 Power generation: The demand for grid power is estimated to grow by 6 per cent per annum by the end of the Twelfth Plan. Capacity addition in the power sector would be about 50,000 to 52,000 MW during the Eleventh Plan. In order to achieve the projected capacity addition of 1,03,300 MW and build commensurate transmission and distribution capacity, investment to the tune of ₹ 11,18,375 crore would be needed. Apart from the financing issue, the power sector would be constrained by shortage of fuel and environmental issues. Mismatch in coal supply and shortage of gas for the power sector have been impacting the output presently. Delay in forest and environmental clearance in particular for hydro- based power projects has delayed capacity addition. There are financial health and viability issues across the entire spectrum of power sector--generation, transmission, and distribution. Viability of the players in power sector would require either the adjustments of the user charges in line with the cost of providing access to these services or an adjustment in the subsidy levels.

11.101 Coal Sector: Coal is a primary energy input for thermal power generation, steel, and cement sectors. The gap between demand for coal and

Table 11.15 : Wholesale Price Index for Fuel Group of Commodities (2004-05=100)

	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12# Apr.-Dec.(P)
	Financial-year averages						
Allcommodities	104.5	111.4	116.6	126.0	130.8	143.3	154.9
Crude petroleum	109.8	127.0	136.6	149.7	181.4	202.8	284.3
Coal	117.6	117.7	121.7	151.3	156.5	165.3	184.6
Electricity	102.6	105.3	106.2	106.4	107.4	113.2	114.4
Administered petroleum products*	115.2	123.5	119.7	128.9	125.1	144.8	161.1
Other petroleum products	122.7	142.2	151.2	191.2	176.3	205.5	258.1
Overall fuel index	113.4	121.3	121.9	135.8	134.9	151.4	173.0
Relative index							
Crude	96.7	104.6	112.0	109.8	134.3	133.9	164.3
Coal	103.9	97.1	99.8	111.8	116.0	109.2	106.8
Administered petroleum products	101.6	101.8	98.2	95.0	92.7	95.6	93.1
Other petroleum products	108.1	117.2	124.0	139.5	130.4	135.6	149.1
Electricity	90.6	86.9	87.2	78.6	79.7	74.8	66.1
Overall Fuel	108.5	108.9	104.5	107.7	103.1	105.6	111.7

Source : Economic Divsion, Department of Economic Affairs based on WPI data.

* Covers LPG, Kerosene, Diesel and Petrol. # Data for 2011-12 are provisional.

domestic availability is widening at a faster pace. The production projections for the coal sector during the Eleventh Plan had to be revised downward due to delays in obtaining forest and environment clearances, land acquisition and related resettlement and rehabilitation issues, and law and order problems. Such revisions affect the long-term supply arrangements. Coal India Limited (CIL) dominates the domestic coal scenario. Its near monopolistic position has often resulted in supply bottlenecks, delays in development of new coal fields and, inadequate emphasis on cost reductions at operational levels. Coal pricing is also a crucial issue. CIL being the dominant producer of coal in the country has to adopt pricing policy which is transparent, credible, and based on global norms. There is perhaps need to introduce competition in this sector.

11.102 Railways sector: Capacity addition in the railways sector remains the key challenge for coming years. The sector has huge opportunity to grow and the rail share in cargo and passenger services can increase significantly. Its current share of freight traffic in India is only about 36 per cent as compared to about 50 per cent in the US and China. Due to capacity constraints, Indian Railways is unable to offer value-added services. There is need for a paradigm shift in building rail infrastructure and running rail services. The Vision 2020 document of the Ministry of Railways projects investment need of ₹ 7,20,000 crore for the sector. During the Twelfth Plan the railways' focus would be on construction of six dedicated freight corridors, segregation of freight and passenger lines, providing improved connectivity to industry clusters and ports, etc. Railways has been generating about 35 per cent of resources internally, about 27 per cent is raised through EBR, and the remaining 37 per cent is provided through budgetary support. Given the limitation of internal and budgetary sources, bulk investment has to be done by the private sector through PPP. Railways has initiated PPP projects during the Eleventh Plan in some areas such as port connectivity projects, container operations, wagon investment schemes, and private freight terminals but the scope of PPP needs to be widened further. In order to promote PPP in the rail sector, there is need to set up special units to handle and monitor PPP projects and give special thrust on capacity building.

11.103 Road transport: The targets for the road transport sector during the Twelfth Plan are indeed massive. There is need to upgrade the National Highways to two lane, build expressways in high and dense traffic segments, and urgently improve the riding quality of the road network in general. As against the estimated public and private-sector investment of about ₹ 1,52,201 crore during the Eleventh Plan, the total investment requirement during the Twelfth Plan in the central sector for roads would be about ₹ 6,11,344 crore. The share of the private sector is projected to be about 38 per cent. The sector is yet to achieve the target of 20 km roads a day due to delays in land acquisition and environmental and forest clearances, poor performance of contractors, shortage of qualified highway engineers and skilled/semi-skilled labour, delays in release of loan instalment to contractors by banks, and local law and order problems. Several initiatives have been taken for resolving these issues and it is expected that during the Twelfth Plan road construction work will pick up.

11.104 Ports sector: Presently 12 Major ports are handling about 64 per cent of the seaborne traffic. Though the share of non-major ports has increased from 7 per cent in 1990-1 to about 36 per cent in 2010-11, the congestion at major ports is costing in terms of time and money. Cargo handling is projected to increase significantly at all ports during the Twelfth Plan. The challenge for the sector is to build vibrant, efficient, and safe ports and shipping services and a strong base for the shipbuilding industry. Capacity augmentation and efficiency improvement would require increased investment from the private sector, particularly for mechanization of cargo handling, improvements of drafts at the ports, strengthening port connectivity by building road and rail links, and technology upgradation and automation. Investment required for ports sector development during the 12th Plan would be about ₹ 1,55,455 crore. Capacity expansion of ports in the Twelfth Plan is proposed largely through private-sector investment and internal accruals. It would indeed be a challenge to garner about 80 per cent (₹1,23,982 crore) of the required investment through PPP. The government proposes to develop two new major ports, one each on east and west coasts and build facilities for full mechanization of cargo handling and movement and plans to develop of two hub ports each on the west and east coasts--Mumbai (JNPT), Kochi, Chennai, and Visakhapatnam. The proposed policy measure also targets corporatization, formulation of a new land policy for major ports, and establishing of a port regulator for all ports for setting, monitoring, and regulating service levels and technical and performance standards.

11.105 Urban infrastructure: Urban population is projected to increase to 598 million in the year 2031 and the share of urban population is projected to increase from 31.2 per cent in 2011 to about 40 per cent in 2030. Continued demographic shift from rural to urban areas and rapid urbanization are posing a huge challenge in terms of creation and maintenance of minimum level of infrastructure and services. There is need to upgrade urban infrastructure such as water supply, sewerage, solid waste management, urban roads, storm water drains, urban transport, traffic support infrastructure, and street lighting. At present only about 74 per cent of urban population is supplied piped water, less than two-thirds of urban population in Class I and Class II towns is connected to the sewer system, scientific treatment and disposal of solid waste is practically non-existent, and public transport accounts for only 22 per cent of urban transport in the country. Urban India is deficient in service delivery and the quality of service leaves much to be desired. ULBs are under financial stress and also suffer on account of poor governance. In order to achieve the services norms for eight infrastructure sectors adopted by the Ministry of Urban Development, investment from the base year (2011-12) of about ₹ 51,000 core would need to be stepped up at the rate of 15 per cent per annum during the Twelfth Plan tapering off to 12 per cent per annum during Thirteenth Plan and 8 per cent per annum thereafter. The ULBs need to be able to mobilize internal resources, apart from the devolution from states' revenue share and central and state funds made available for various schemes. The ULBs also need to take recourse to new forms of financing through PPP.

11.106 Civil Aviation sector: As per the findings of the study on Socio-Economic Impact of Civil Aviation in India commissioned by the International Air Transport Association (IATA), the contribution of the civil aviation sector to India's GDP is estimated to be 0.5 per cent. This sector generates 1.48 million jobs (including indirect jobs). High growth rates for the past few years in the aviation sector, particularly in the passenger segment, are not getting reflected in the financial health of the carriers in India. To manage the next growth phase safely and efficiently, significant and continuous investment will be required. One of the major challenges of the air traffic industry in India is the high and growing debt burden of the carriers. The airline industry in India suffers from huge debt burden - close to US $ 20 billion (estimated for 2011-12). Half of this debt is aircraft related and the rest is for working capital loans/ payments to airport operators and fuel companies. FDI policy currently does not permit foreign airlines investment that denies them access to potential sources of capital and expertise. Air carriers so far have also been affected by the high ATF prices because of high incidence of taxes. The recent decision to allow them import of ATF will hopefully improve their operational economics, but in the long run airlines will need to improve their internal accruals, access to domestic and international capital, and their overall operations to remain vibrant and viable.