

CHAPTER-3

Hydro-Power Generation in HP

3.1 Power is a critical infrastructure for the socio-economic development of the country. This century would be dependent on the availability of adequate, reliable and quality power at competitive rates. Therefore, the basic responsibility of “Electricity Industry” is to provide adequate power at economical cost, while ensuring reliability and quality of supply.

3.2 Development of hydro power is essential for the sustainable development of the country and efforts for accelerating the pace of hydro power development shall give an impetus for the economic growth in the new globalised economy. Large untapped hydro-power potential exists in the Himalayas, which can make a substantial contribution to the total power generation in the country. The country has no other option but to tap hydel power in a big way, if it has to avoid energy crisis in the long run.

3.3 Himachal Pradesh is blessed with abundant water resources in its five major rivers i.e. Chenab, Ravi, Beas, Satluj and Yamuna, which emanate from the western Himalayas and flow through the State. These snow fed rivers and their tributaries carry copious discharge all the year round which can be exploited for power generation. All the river basins and its valleys are connected by roads and others.

3.4 Hydro power development process started even before the evolution of the State. A small project of 0.45 MW capacity was got executed by the erstwhile Raja of Chamba State in 1908 which was followed by a small project at Chaba with capacity of 1.75 MW near Shimla in 1912. Another hydro-power project of 48 MW capacity was constructed at Shanan near Jogindernagar in District Mandi during the mid twenties by the then British Government.

3.5 The hydro power potential in the State of Himachal Pradesh has been estimated at 23560 MW, which is one fourth of India’s total hydro power potential of about 112059 MW. To exploit this huge potential and to give utmost thrust to the development of hydro-power, State Govt. has framed a four pronged strategy under which projects are to be executed under various management modules i.e. in the State Sector, Joint Sector, Private Sector and the Central Sector agencies.

3.6 The major contribution in exploiting 6448 MW of power till date has been from the Central/Joint Sector Projects (5490.57 MW) followed by Private Sector Projects and Him-urja (491.05 MW) and State Sector Projects (466.95 MW).

The details are given as under :-

Table-1

1.	BBMB	2711.00 MW
2.	PSEB	110.00 MW
3.	NHPC	1038.00 MW
4.	UPSEB	131.57 MW
5.	SJVNL	1500.00 MW
6.	HPSEB	466.95 MW
7.	IPPs (Private Sector)	402.00 MW
8.	HIMURJA (Less than 5 MW)	89.05 MW
	Total	6448.57 MW

3.7 Further, the capacity addition of about 3507 MW, details of which are given below is expected to be made during 11th Plan in State, Central/Joint and Private Sectors. During 12th Plan 6397 MW of hydro power has been planned to be harnessed in the State, Central / Joint and Private Sector.

PROJECTS PLANNED FOR XI TH PLAN

Table-2

Sr. No.	Name of Project	District	Nallah/ River/Basin	Targeted installed capacity in MW	Likely year of Commissioning
1.	2.	3.	4.	5.	6.
A	PRIVATE SECTOR PROJECTS				
1.	Karcham- Wangtoo	Kinnaur	Satluj	1000.00	Nov., 2011
2.	Allain- Duhangan	Kullu	Beas	192.00	March, 2010
3.	Malana-II	Kullu	Beas	100.00	2010-11
4.	Budhil	Chanab	Ravi	70.00	2011-12
5.	Sorang	Kinnaur	Satluj	100.00	2011-12
			Total-A	1462.00	
B	CENTRAL/ JOINT PROJECTS				
1.	Parvati-II	Kullu	Parvati/ Beas	800.00	2010-11
2.	Chemera-III	Chamba	Ravi	231.00	2010-11
3.	Kol Dam	Bilaspur	Satluj	800.00	2011-12
			Total-B	1831.00	
C	STATE SECTOR PROJECTS				
1.	Uhl Stage-III	Mandi	Uhl/Beas	100.00	March, 2012
2.	Ghanvi-II	Shimla	Ghanvi/ Satluj	10.00	March, 2011
3.	Bhaba Aug Power House	Kinnaur	Kangti/ Satluj	4.50	March, 2011
4	HIMURJA PROJECTS			100.00	
			Total-C	214.50	
G.Total(A+B+C)				3507.50	

3.8 Himachal Pradesh has formulated a Hydro Power Policy, 2006 to develop Himachal Pradesh as a “Hydro-Power State” of the country and to provide an affordable, reliable and quality power to the consumers round the clock, through out the year, create avenues for employment to its residents and at the same time mitigate the social, economic and environmental impact. Salient features of the ‘Power Policy’ 2006 are given below:-

- To harness and commission hydro-power generating capacity by the end of 11th Plan thereby having an operational capacity of about 15,000 MW out of the identified power potential.
- Small Hydro Projects up to 2.00 MW capacities shall be exclusively reserved for the bonafide Himachalies and Co-operative Societies comprising of the bonafide Himachalies. While allotting such projects up to 5.00 MW, preference will be given to the bonafide Himachalies. Not more than 3 Projects shall be allotted for implementation to an IPP.
- To allot the Hydro-Electric Projects to the prospective Independent Power Producers (here in after referred to as IPP) for the implementation in private sector on Build, Own, Operate and Transfer (BOOT) basis by inviting Global bids, for the projects of capacity above 5 MW.
- The Bidders would be required to quote a fixed upfront of Rs. 20.00 lakh per Mega Watt capacity of the project and ‘Additional Free Power’ at a uniform rate in all three time bands of royalty charges during the operation period of the project to the Government of Himachal Pradesh over and above the royalty charges of 12% , 18% & 30% of the deliverable energy up to 12 years, next 18 years and balance agreement period beyond 30 years from scheduled commercial operation date / synchronization of first generating unit which ever is earlier, in lieu of surrender of the potential site.
- The Govt. of H.P./HPSEB shall have right of first refusal on sale of such power as remains after meeting commitments of royalty in the shape of Free Power, additional Free Power and Merchant Sale of Power (as may be determined under the National Hydro Power Policy), on tariff to be determined by the H.P. State Electricity Regulatory Commission.
- The Govt. of Himachal Pradesh reserves the right of equity participation up to 49 % on selective basis in the above projects.
- The operation period of the projects shall be forty (40) years from the scheduled commercial operation date (COD) of the project, where after, the project shall revert to the State Government free of cost and free from all encumbrances on ‘as is where is basis’.

- The Company shall have to provide employment to bonafide Himachalies, in respect of all the unskilled/skilled staff and other non-executives as may be required for execution, operation and maintenance of the project. If it is not possible to recruit 100% staff from Himachalies for justifiable reasons, only then the company shall maintain not less than 70% of the total employees / officers / executives from bonafide Himachali.
- The Developer shall make a provision of 1.5% of final cost of the project towards Local Area Development Committee (LACD). The activities of which shall be financed by the project itself.
- In order to protect the aquatic life and the water rights of local inhabitants as well as environment in general, the policy requires release of a minimum flow of 15% immediately downstream of the diversion structure of the project.
- The Govt. of Himachal Pradesh shall absorb the generated power from small Hydro-Electric Projects locally to the maximum possible extent. The Govt. shall also prepare a Transmission Plan for evacuation of power generated by the small Hydro-Electric Projects and other projects up to 25 MW capacity. The Transmission Plan shall be prepared to cater to evacuation of power up to the nearest points of full absorption of the total injected power from various projects and even beyond the inter-connection sub-stations of HPSEB and the cost thereof shall be borne by the Hydro Project Developers in proportion to the capacities of their projects.
- To meet out the evacuation of power from projects under construction, the Govt. of H.P. has set up a separate Transmission Corporation (HPTCL). The Corporation has prepared a Master Plan for evacuation of power from various river basins involving the expenditure of Rs. 4667 crores.

3.9 Of the identified hydel-power potential, only 6448.00 MW has so far been exploited by various agencies. Details of potential assessed and actualized are given on the table below:-

1. BASIN-WISE POWER EXPLOITED:

Basin-wise position of potential assessed and exploited is given in the Table – I.

Table-3

Potential Assessed and Actualised

Sr. No	Basin	Total Assessed Potential (MW)	Potential Installed (MW)				
			State Sector	Private Sector	Central / Joint Sector	Him-urja	Total
1.	2.	3.	4.	5.	6.	7.	8.
1.	Satluj	9866.55	150.25	300.00	2825.00	3.90	3279.15
2.	Beas	4626.90	226.50	102.00	1496.00	56.95	1881.45
3.	Ravi	2345.25	10.25	0.00	1038.00	16.20	1064.45
4.	Chenab	2251.00	0.00	0.00	0.00	0.00	0.00
5.	Yamuna	602.52	79.95	0.00	131.57	12.00	223.52
6.	Other small rivers/rivulets	723.40	0.00	0.00	0.00	0.00	0.00
	Total	20415.62	466.95	402.00	5490.57	89.05	6448.57

1. PROJECTS COMMISSIONED:

Executing agency wise details of the projects commissioned and potential harnessed is as under:-

Table-4

Projects Commissioned and Capacity Installed

Sr.No.	Executing Agency	Installed Capacity (MW)
1.	2.	3.
1.	BBMB	2711.00
2.	PSEB	110.00
3.	NHPC	1038.00
4.	UPSEB	131.57
5.	SJVNL	1500.00
6.	HPSEB	466.95
7.	IPPs	402.00
8.	HIMURJA	89.05
	Total	6448.57

2. SECTOR-WISE STATUS OF THE PROJECTS COMMISSIONED:

Sector wise status of the capacity installed is given as under:-

I. State Sector (HPSEB):

Table-5

Projects and Capacity Installed

Sr.No.	Name of the Project	Installed Capacity (MW)
1.	2.	3.
1.	Giri	60.00
2.	Bassi(Uhl-II)	60.00
3.	SVP Bhaba	120.00
4.	Andhara	16.95
5.	Thirot	4.50
6.	Binwa	6.00
7.	Baner	12.00
8.	Gaj	10.50
9.	Ghanvi	22.50
10.	Gumma	3.00
11.	Holi	3.00
12.	Larji	126.00
13.	Khauli	12.00
14.	Mini Micro (7 Nos)	10.50
	Total	466.95

II. Private Sector:

Table-6

Projects and Capacity Installed

Sr.No	Name of the Project/District/Basin	Executing Agency	Installed Capacity (MW)
1.	2.	3.	4.
1.	Baspa-II / Kinnaur / Satlulj	M/s Jai Prakash Hydro Power Ltd.	300.00
2.	Malana-I / Kullu / Beas	M/s Malana Power Company Ltd.	86.00
3.	Patkari / Kullu / Beas	M/s Patkari Power Pvt. Ltd.	16.00
		Total:	402.00

III. Central / Joint Sector:

Table-7

Projects and Capacity Installed

Sr.No.	Name of the Project	Executing Agency	Installed capacity (MW)
1.	2.	3.	4.
1.	Yamuna Projects (H.P. Share)	Uttrakhand	131.57
2.	Baira Suil	NHPC	198.00
3.	Chamera-I	NHPC	540.00
4.	Chamera-II	NHPC	300.00
5.	Shanan Project	PSEB	110.00
6.	Pong Dam	BBMB	396.00
7.	Dehar	BBMB	990.00
8.	Bhakra	BBMB	1325.00
9.	Nathpa Jhakri	SJVNL	1500.00
	Total:		5490.57

IV. Himurja:

1.	Himurja Projects	89.05MW
	Total:	89.05 MW

As mentioned above, State Govt. has adopted a multi-pronged strategy for the exploitation of hydel power in the State. Under this policy, power projects execution and management is done by different executing agencies under State Sector, Central/Joint Sector, Private Sector and Independent Power Producers. For the 11th Plan (2007-2012) it has been planned to add 3507.50 MW capacity to the already exploited potential. The sector-wise details of the projects under execution are given in the succeeding paragraphs.

A. State Sector: State Sector is comprised of three agencies viz (a) HPSEB (b) Himachal Power Corporation and (c) Himurja. The executing agency wise details are given below:-

(a) HPSEB: Himachal Pradesh State Electricity Board is responsible to add 466.95 MW Hydel Power Capacity by commissioning of 13 Major and 7 Mini-Hydro-Electric projects. During the course of 11th Plan, HPSEB will execute following projects:-

1. UHL Stage-III (100MW): Uhl Stage-III Hydro Electric Project (100MW) scheme envisages utilization of tail water of Bassi Power House, the discharge of Neri Khad and Rana Khad through two water channels viz. Rana intake to Khuddar reservoir and Neri collection chamber to Khuddar reservoir, one aqueduct, one head race tunnel 8,477 meters long and single penstock trifurcating near the power house to generate 100 MW of power by utilizing design discharge of 41.30 cumecs over a gross head of 299.40 meters through three generating units of 33.3 MW each. All the packages of main civil works, hydro-mechanical and electro-mechanical packages have been awarded. The project when completed will generate 391.19 MU in 90% dependable year. The Central Electricity Authority (CEA) has accorded the techno-economic clearance (TEC) to the project for Rs. 431.56 crore based on Sept. 2002 price level with loan and equity in the ratio of 70:30. The revised cost estimates amounting to Rs. 940.80 crore at March, 2008 price level has been framed which is under consideration of the Board. The cost of generation at Bus bar (a house of distribution of power) works out to Rs.2.35 per unit. This project is being executed through Beas Valley Power Corporation Ltd. on fast track basis with dedicated funds. The project is scheduled to be commissioned during March, 2012.

2. GHANVI HYDRO ELECTRIC PROJECT STAGE-II(10 MW): Ghanvi Hydro Electric Project Stage –II(10MW) is a run of the river scheme on Ghanvi rivulet, a tributary of Satluj river at an estimated cost of Rs. 49.49 crore. The project is located near Jeori township about 150 Km from Shimla. The power house site is near Ghanvi which is about 12 Km from Jeori. This scheme envisages construction of drop type trench weir near village Rungha to divert the water. This diverted water will be conveyed through 1.8 m size, D-shaped 1440 m long Head Race Tunnel and one penstock bifurcating near power house to feed two turbines in an underground power house to generate 10MW of power by utilizing a gross head of 165 m and designed discharge of 7 cumecs. The annual energy generation in a 75% dependable year is expected to be 41.63 MU.

This project is being executed by HPSEB. The funds have been arranged from M/s Rural Electrification Corporation who has sanctioned a loan amounting to Rs. 3415.32 lakh on 01.01.2004. The project is scheduled to be commissioned during March, 2011.

3. BHABA AUGMENTATION POWER HOUSE (4.50 MW): The scheme with enhanced capacity from 3.00 MW to 4.50 MW is located in District Kinnaur. It envisaged trench weir across Shango Khad a tributary of Bhaba Khad about 3.00 Km. upstream of confluence of Shango Khad with Bhaba Khad near village Curchoo, desilting tank 30x10x3 m size, 2.1 m D-shaped 4682 m long Head Race Tunnel, underground Forebay 26x6x6.2 m size, Penstock 800 mm internal dia 450 m long, Tail Race Tunnel 2.1x2.1 m size 90 m long and Surface Power House with installed capacity 4.50 MW near intake of Bhaba Hydro Electric Project (HEP) having 2 Nos. turbine pelton wheel horizontal axis, with 2.25 MW capacity each. This project on completion is expected to generate 26.63 MU in 75% dependable year. The funds required for

completing the balance works have been arranged from the Power Finance Corporation (PFC). A loan of Rs. 11.00 crore has been sanctioned by M/s PFC. The project is scheduled for commissioning in March, 2011.

4. KHAULI HYDRO ELECTRIC PROJECT STAGE-II (6.60MW) : Khauli Hydro-Electric Project Stage-II (6.60 MW) has been contemplated as a power generation development on Khauli Khad a tributary of Gaj Khad in Kangra district of Himachal Pradesh. It is an immediate downstream development of Khauli-I Hydro Electric Project (12MW) which has already been commissioned. It envisages utilization of tail water of Khauli-I Hydro Electric Project through a net head of 257 m for generation of 6.60 MW of power in Surface Power House on left bank of Khauli Khad near village Rihlu at a distance of about 6 Km from Shahpur.

This project is a very attractive scheme from all aspects and merits. The Detailed Project Report (DPR) of this scheme has been prepared by the HPSEB for a total cost of Rs. 52 crore at December, 2008 price level. This project will generate 29.95 MU of power in 75 % dependable year. The techno-economic clearance (TEC) of this project has already been issued by the HPSEB.

(b) HIMACHAL PRADESH POWER CORPORATION LTD. (HPPCL)

Himachal Pradesh Power Corporation Limited (HPPCL) was incorporated in December, 2006 under the Companies Act 1956, with the objective to plan, promote and organize the development of power generation on behalf of Government of Himachal Pradesh (GoHP). Himachal Power Corporation Ltd. became fully functional in 2008-09 and has earlier been assigned 7 Hydro Electric Power Projects for construction with a capacity of 1016 MW. The construction work has been started in 2 projects Sawra Kuddu HEP (111 MW) and Integrated Kashang HEP (243 MW). All statutory clearances except TEC of Sainj HEP have been accorded. The project is being executed on EPC basis and tenders have been invited and opened on 30.10.09 and are likely to be awarded by March, 2010. The statutory clearances for Shongtong Karcham HEP and Renuka Dam Project are in process & construction work will be started within 2010, whereas, Chirgaon Majhgaon HEP (60 MW) & Tidong- II HEP (60 MW) are under investigation stage.

The Govt. of Himachal Pradesh has allotted 12 new projects to Himachal Pradesh Power Corporation Ltd. on dated 22.09.2009. These projects are Gyspa (300 MW), Chhoti Saichu HEP (26 MW), Saichu Sach Khas (104 MW), Lujai HEP (45 MW), Saichu (43 MW), Surgani Sundla (42 MW), Deothal Chanju (38 MW), Chanju-III (42 MW), Tosh+Parvati-I (400 MW), Beri Nichali (78 MW), Thana Plaun (141 MW) and Khab (636 MW). As per allotment letter a presentation highlighting schedule for completion of projects has been made in the HPPCL Board & Infrastructure Development Board. Out of 12 new projects, 4 projects Gyspa (300 MW), Surgani Sundla (42 MW), Tosh+Parvati-I (400 MW), and Khab (636 MW) are

being taken up for survey and DPR preparation immediately. The remaining projects are being taken in a phased manner as per accessibility etc.

A loan of US \$ 800 million has been sanctioned by the Asian Development Bank for 4 projects i.e. Sawra Kuddu HEP (111 MW), Integrated Kashang HEP (195 MW), Sainj HEP (100 MW) and Shongtong Karcham HEP (402 MW). For the execution of these projects, State Govt. has provided a loan of Rs. 190.00 crore and Rs. 100.00 crore as equity contribution as 30% of the project cost will be met through equity contribution where as remaining 70% of the project cost will be financed through loan.

The Renuka Dam project is to be funded by Govt. of India to the extent of 90 % of the project cost and 10 % will be paid by the other beneficiary states. The H.P. Govt. will have to pay only for the power component.

Recently, HPPCL in a joint venture with EMTA Power Ltd. has registered a company in the name of HEPL to develop a 500 MW pithead thermal station in Raniganj, West Bangal to meet the winter power demands of the State. The coal mine has already been allotted by Ministry of Coal. The possibilities of Wind & Solar Power development in the hilly State are being explored to have a coherent roadmap to fully exploit the latent potential of renewable energy sources in the State and as per the policies of the Government.

Status of Projects (as on 30.11.09): -

1. Sawra Kuddu HEP (111 MW)

1. Land Acquisition:-

a) Private Land (46.7067ha)

- Out of 46.7067 ha land, 32.2805 ha land has been acquired and mutation completed. For balance 14.4262 ha land, proceedings under various sections are in progress.

b) Forest Land (53.9043ha)

- Out of 53.9043 ha land, 53.21 ha land diverted and case for balance 0.6943 ha final approval is awaited from MoEF.

2. Investigation and Site Selection:-

- All investigation and Site selection works are completed.

3. Statutory Clearance:-

- All statutory clearances obtained.
- Availing of carbon credits is in process.

4. Infrastructure Work:-

Roads:

- All approach roads to various project components completed.

Residential and Non Residential Buildings:

Hatkoti colony:

Permanent buildings: Residential:

- Work for type-II, III & V - 95 % works completed, balance works are progress.

Non Residential:

- Office building, Rest House etc. – 75 % works completed, balance works are in progress

Snail colony:

Permanent buildings: Residential:

- Type- I, II, III, IV & V – 85 % works completed, balance works in progress.

Non Residential:

- Officers, Staff club and Outhouses etc. - 95 % works completed, balance works are in progress.

5. Relief & Rehabilitation:-

- Approved R&R plan is being implemented.
- List of PAFs & PAAs prepared & sent to DC Shimla for verification.

- Social impact and baseline survey – Field Survey works completed and final report from Dr. Y. S. Parmar University is awaited.

6. Major Works:-

Package-I (Diversion structure, Intake & Desilting Chambers):

- The work has been awarded to M/s Patel Engineering Ltd. on 25.08.09.
- Diversion Barrage - Out of 158930 m³ of cutting, 30800 m³ cutting has been done & work is in progress.
- River Diversion – Out of 16000 m³ of cutting, 13350 m³ cutting has been done & work is in progress.
- Desanding arrangement - Out of 111420 m³ of cutting, 13300 m³ cutting has been done & work is in progress.

Package-II (HRT):

Adits – Total length of 4 No. Adits 934.854 m - Excavation of all adits completed.

HRT – Total length of HRT 11231.65 m - Excavation of 2936.43 m length of HRT completed from 7 faces and work is in progress.

Package-III (Power House Complex):

- The work has been awarded to M/s Patel Engineering Ltd. on 22.01.09.
- MAT – Total length 239 m - excavation completed.
- Cable tunnel cum Construction adit – Total length 356 m - excavation completed.
- Pilot hole to top of Power House (90 m) – excavation completed.
- Adit to Bottom of Pressure Shaft (330.776 m) – excavation of 147 m completed and work is in progress.
- Power House cavern – Out of 36302 m³ underground excavation, 2042.361 m³ has been done and work is in progress.
- Transformer hall Cavern – Out of 27740 m³ underground excavation 2491.53 m³ has been done and work is in progress.
- Surge Shaft – Out of 13600 m³ of open excavation **10925 m³** have been done and work is in progress.
- Construction off Pilot Hole 4 m dia - out of 77 m, 10 m has been done and work is in progress.

Package-IV (E&M Equipment):

- The work has been awarded to M/s ANDRITZ Hydro (earlier VA Tech.) Bhopal on 05.02.09.
- Equipment layout and other drawings have been received and are being checked.

2. RENUKA DAM PROJECT (40 MW)

1. Land Acquisition:

a. Private Land (1319 ha):

(i) Through Land acquisition process (1061 ha).

- Notification under section IV issued for : 881.00 ha
- Report received for 860 ha and awaited for 21 ha.
- Pending with H.P. Govt. for Section-IV notification : 180.00 ha

(ii) On lease basis (258 ha) for quarry & dumping site.

- Land identified. Case to purchase 21.1 Bigha Pvt. Land for dumping at first instance is in process.

b. Forest Land 640 ha (410 ha perm. + 230 ha temp.):

- Complete case for diversion of land (410 ha Perm. + 230 ha Temp.) i/c 111 ha Govt. land (deemed Forest) has been resubmitted to MoEF and final approval is awaited.

c. Govt. land (111 ha + 15 ha):

- Case for transfer of remaining 15 ha land is under process with D.C., Sirmaur.

d. Additional Land for Res. buildings & Colony roads

- 35 bighas & 16 biswas: - Case submitted to GoHP for section IV.
- 13 bighas 19 biswas: - Notification under Section VI & VII issued. Proceedings under section-VIII are underway.
- Alternate land 32 bighas identified and revenue papers are being collected.

e. Land for rehabilitation colony & allotment to PAF

- Land at 3 different locations near Dhaulakaun measuring 120 bighas, 57 bighas & 32 bighas identified, shown to PAFs. Demarcation of land is in process.
- Case for transfer of Govt. land (828 bighas):- DC Sirmour informed that Bio-Technology park is to be constructed on this land & cannot be transferred to HPPCL.
- Land 300 bighas identified at Paonta Sahib & is being shown to PAF shortly.

2. Investigation and site selection:

- Major investigation works and site selection for components has been completed.
- Geological report of drill hole DH-21, 22, 23, 24, 25 & 26 received from GSI on 30.11.09.
- Quarry sites are identified. Material testing report received from CSRMS is under scrutiny.
- Explosive Magazines – Site identified revenue papers collected land acquisition under process and case for issue of license sent to Chief Explosive Controller, Nagpur.

3. Statutory Clearances:

a) Environment Clearance:

- Environment clearance accorded by MoEF on 23.10.09.

b) TEC:

- The revised cost part (Civil & Electrical Chapter) submitted in CWC on 04.08.09 and final DPR submitted in CWC on 13.11.09.

4. Infrastructure Works:

- All project roads planned. Estimate prepared and tendering works are in process.
- For supply of construction power revised demand note of Rs. 186.42 Lac received from HPSEB. Requisite amount deposited to HPSEB.

5. R&R:

- Approved R&R plan is being implemented.
- LADA committee reconstituted by DC Sirmour, Dy. General Manager, Renukaji Dam Project also nominated as a member.
- 13 Nos. candidates sponsored for admission in ITIs. 9 candidates joined have joined the course.
- 69 Nos. candidates selected for scholarship scheme of HPPCL and conveyed to awardees.
- Major PAFs have been identified, list prepared and updating of list under process.
- Till date 7 Nos. camps have been organized and balance will be organized shortly.
- Work for carrying out SIA & Baseline Survey has been completed for PAA and for PAZ will be taken up shortly.
- Work worth Rs. 25 Lac above LADA as per recommendation of Panchayat Pradhans awarded to PAFs.

6. Major works:

a. Diversion Tunnels:

- The layout marked at site for the visit of GSI Geologists.
- Based on updated Hydrology and Geology the size of tunnel has been revised to 10.5 m.
- Geotechnical Instrumentation: - Scope finalized & short listings of firms are under process.
- Bidding documents are under preparation.

b. Main Dam:

- The preparation of bidding documents for execution of project on EPC mode is under preparation. Work is likely to be awarded by June, 2010.

3. INTEGRATED KASHANG HEP (195 MW) (Stage-I, II & III)

(Stage-I)- 65 MW

1. Land Acquisition:

a) Private Land (15.4863 ha):

- Land acquired & mutation completed.

b) Forest Land (18.7412 ha):

- Forest land diverted.
- Transferring of SJVNL surplus land (1.8048 ha) at Jeori is in process.

2. Investigation & Site Selection:

- Major investigation and site selection works are completed.
- Mining Lease agreement signed and the registration is in progress.
- For installation of crusher at Akpa NoC of Pangi panchayat awaited.

3. Statutory Clearances:

- Environment & Forest clearances accorded by MoEF for Kashang stage-I.
- For availing Carbon Credits agreement signed with Asia Pacific Carbon Fund of ADB.
- Rs. **303 Lac** deposited in Forest Department for implementation of CAT plan.
- **TEC** for stage – I accorded by HPSEB on 31.07.2008.

4. Infrastructure Works:

- Approach road to power House completed.
- Approach road from Pangi to intake site made vehicular & handed over to executing agency i.e. HCC.
- Work for Residential colony at Pangi has been awarded on 27.10.09. The works of development of Benches are in progress.
- Pre-fabricated structures at intake site - 90% works completed, work is in progress.
- Field hostel at Intake site – Bench developed, tender work under process.

5. Relief & Rehabilitation:

- Approved R&R plan is being implemented.
- R&R cum Public Information Office opened and made functional at Pangi.
- 3 Nos camps organized and balance will be organized shortly.

- Social Impact & Base Line Survey Work – Work has been awarded to Integrated Institute of Himalayan study from HPU. Field work carried out and report awaited.
- 6 person from PAF's sponsored to ITI's& joined the course.
- people from PAFs nominated for self employment scheme.
- Rs. 50 Lac allotted to Pangi Panchayat for development work other than LADA and are being executed.

6. Major Works:

Package –I (*Civil and hydro mechanical works*): for stage – I

- Awarded to M/S HCC on **27.02.09.**
- **Adit to bottom of P/Shaft & top of PH/ crown –**
Total length 414.90 m – 170.5 m completed.
- **Adit to T/Hall cum cable tunnel –**
Total length 190.32 m – 119 m completed.
- **Adit to Tail Race Tunnel –**
Total Length 193.66 m - 73 m completed.
- **Adit to intermediate Adit to HRT –**
Total Length 182 m – 72 m completed.
- **Intermediate Adit to middle horizontal Pressure Shaft –**
Total Length - 372 m – 3.5 m completed.
- **Adit to balancing reservoir –**
Total Length - 410.12 m – 51.50 m completed.
- **Conveyance Channel Bench excavation –**
Total Quantity 23450 m³ - 3350 m³ completed.

Package-II (*E&M works*) for stage-I, II & III:

- Tendering process completed, bids are opened and under evaluation process.

(Stage-II & III)-130 MW

1. Land Acquisition:

a) Private Land (3.3494 ha):

- For acquisition of land notices under various section issued and further action is in process.

b) Forest Land (17.6857 ha):

- For diversion of land Pr. CCF submitted the case to MoEF Chandigarh.

2. Investigation & Site Selection:

- Topological Survey & Geological investigations has been done and
- incorporated in the DPR.
- Quarry site – identified and finalized.
- Dumping sites - identified and incorporated in forest diversion case.
- Water quality, silt & aggregates tests - completed.

3. Statutory Clearances:

a) Environment Clearance:

- Environment & Forest clearances by MoEF is in process and 2nd presentation to MoEF held on 15.12.09

b) TEC:

- TEC accorded by Pr. Secretary Power, GoHP for Rs. 488.19 Crore on 10.09.09.

4. Infrastructure Works:

- Office accommodation is established on hired building in village Lippa.
- 1.44 ha Pvt. Land for setting up of colony and office for Kashang Stage-II, III, IV identified. Inescapability certificate is being obtained.
- The work of approach roads, buildings to be started after acquisition/diversion of private/forest land. Tendering works are in process.
- For providing of construction power for stage-II, III & IV requirement finalized to 1.2 MW and the case submitted to HPSEB.

5. Major Works:

- NIT published. Bid documents are under sale. The last date for submission/ opening of bids is 07.01.10.

Stage-IV (48MW)

1. Investigation & Site Selection:

- Survey, Geological investigation and freezing of layout works are in progress.

2. Statutory Clearance:

- Collection of revenue papers and other documents for obtaining statutory clearances are in progress.

3. Infrastructure Works

- Survey work for approach road to component sites of the project are in progress.

4. SAINJ HEP (100 MW)

1. Land Acquisition:

a) Private Land (8.77 ha.):

- The Governor of HP has accorded approval for Rs. 5, 88, 67,999 for compensation.
- Compensation amounting to Rs. 4.75 Crore disbursed to 240 no. land owner out of 275 no. for remaining case is under process.

Evaluation for compensation of trees completed. Out of 350 structures evaluation of 127 structures completed and for remaining work is in progress.

b) Forest Land (47.993 ha.):

- Final clearance accorded by MoEF on 26.10.09.

2. Investigation and site selection:

- All the investigation and site selection works are completed.
- Works for installation and commissioning of automatic discharge measurement device is in progress.
- All the dumping sites identified and finalized.
- Quarry sites identified and case for transfer of Shilly quarry site taken-up with HPSEB for transfer to HPPCL decision awaited.

3. Statutory Clearances:

a) Environment Clearance:

- Environment clearance accorded by MoEF.

b) Forest Land (47.993 ha.):

- Clearance accorded by MoEF on 26.10.09.

c) TEC

- DPR submitted in CEA/CWC on 17.09.09.
- Presentation for TEC has also been held in CEA on 01.12.09.
- Tests results/reports of river bed material and rock of Barrage site has been received from CSMRS.

4. Infrastructure Works:

- The work for construction of 5/7 m wide road from Access Tunnel to Surge Shaft is in progress.
- The work for construction of 5/7m wide approach road from R/Bank of Shamba bridge to R/Bank of Kartaul Nallah of 251 m length work has been awarded on 31.10.09 and agency is in the stage of mobilizing the men power and machinery at site.
- The work for construction of 5/7m wide approach road from left Bank of Shamba to Barrage site Niharni awarded on 23.11.09 and agency is in the stage of mobilizing the men power and machinery at site.
- Widening of existing forest path 5/7 m wide from Neuli to Samba i/c traffic tunnel awarded & work is in progress.
- Work for widening of HPPWD road awarded & is in progress.
- 2 no. steel bridges – work awarded and is in progress.

- 2 no RCC Deck bridges - Work for RCC Deck bridge on Kotlu Khad awarded and work is in progress. For RCC Deck Bridge on Kartaul Nallah - Award of work is under process.
- Pre-fab structures - for office shed, rest camp and chowkidar quarters completed.
- Work for Traffic Tunnels – work awarded for 150m & 250m. The contractor is mobilizing men and machinery.
- Tendering process for the work of construction of Field hostel at Sarabai is in progress.

5. Relief & Rehabilitation:

- Approved R&R plan is being implemented.
- Camps are being organized regularly in Project Affected Areas. Medical, eye & agriculture camp organized on 11.11.09 at Manahra & Shenshar.
- Preparation of family cards & Individual cards are underway.
- 7 students sponsored for admission in ITIs.
- Merit & sports based scholarship committee constituted for Scholarship Programme for PAF's. Nomination process is underway.

6. Major Works:

- Bidding documents for Civil & Hydro Mechanical works approved by ADB.
- The Techno commercial bids of qualified 4 firms opened on 30.10.09 & are under evaluation. Works are likely to be awarded by Jan., 2010.
- Approval on commercial bid documents for E&M package received from ADB on 28/08/09. Invitation of bids issued & sale of bid documents started on 25.09.09. Bids are scheduled to be opened on 05.01.2010.
- Works are likely to be awarded by March, 2010.

5. SHONGTONG KARCHAM HEP (402 MW)

1. Land Acquisition:

a) Private land (13.8311 ha):

- Notification under section-IV issued by HP Govt. for 7.5619 ha land.
- NoC received from 3 Nos. Panchayats & awaited from remaining 3 No. Panchayats. Process for section-IV is under way for remaining 6.2692 ha land.

b) Forest land (68 ha):

- The case is under scrutiny with Conservator of Forests, Rampur for attending some observations. The observations for revised CAT plan are being attended by WAPCOS.

2. Investigation & Site Selection:

- Major investigation works are completed. Additional Geological exploration as per requirement of CEA are in progress.
- The work for fitment of layout at site is in progress.
- Quarry & dumping sites have been identified.

3. Statutory Clearances:

a) Environment Clearance

- Case for Environmental clearance from MoEF submitted on 01.11.09 and is under process.

b) TEC

- Chapter on Hydrology submitted to CWC on 27.08.09. Water availability approved by CEA/CWC on 20.10.09.
- Power potential studies to increase installed capacity to 426 MW submitted to CEA for approval on 06.11.09.
- Studies regarding fixing of permanent snow lines are underway with SCST&E, Shimla. Reports awaited.
- Reports on Shear wave velocity tests received from IIT Roorkee & are being incorporated in DPR.
- Diversion flood & Design flood peak value data being collected for incorporation in DPR for submission to CEA.

- Specification of E&M aspects prepared and preparation of drawings and reply of power evacuation is in progress.

4. Infrastructure Works:

- Survey work for project roads **completed** and estimates / tendering process is in progress.
- Tenders for the improvement of existing path from bypass road have been floated.
- Construction power (5.8 MW) firmed up. Matter taken up with HPSEB for further action.

5. Relief & Rehabilitation :

- Approved R&R plan is being implemented.
- PAAs notified & PAZs to be notified.
- R&R public information office opened at site.
- Camps will be organized after obtaining NOC from Panchayats.

6. Major Works:

- The bidding documents for execution of Civil and Hydro-Mechanical works of the projects through EPC mode packages are under preparation.
- Commercial bid documents for E&M equipments are under preparation.
- Works are likely to be awarded by March, 10.

6. CHIRGAON – MAJHGAON HEP (60 MW)

a. Investigations and Site Selection

- Water samples collected & sent to PTU, Chandigarh for petrochemical, Petro graphic & Petro fabric analysis. Results awaited.
- Survey completed. Revised layout with low cost alternative from existing 42 MW, taking into consideration the cascade formation on Pabbar River to (60 MW) finalized. However, some modification is needed in the layout. Sr. Geologist's report awaited.
- Matter taken up with GoHP for enhancement of installed capacity to 60 MW from 42 MW.

- Site for hydro meteorological station selected, work awarded & is in progress.

b. Statutory Clearances:-

- State Govt. accorded the approval for 42 MW & as the installed capacity increased to 60 MW, MoEF, GoI will be approached for its approval. ICFRI, Dehradun engaged for the studies.
- NoC from 4 Nos. Panchayats obtained & from remaining 4 Nos. Panchayats is underway.

c. Man Power: -

- Some skeletal staff posted at site. Office opened at Rohru.

**7. TIDONG-II HEP (60 MW)
Progress**

1. Land Acquisition:

- Committee constituted for inescapability certificate/ acquiring Pvt. Land through normal acquisition/negotiation. Revenue papers of 10 bighas land collected.
- Revenue paper for 8.5 bighas (Govt. Land) collected.

2. Investigations and Site Selection:

- Discharge measurement on the available segments of old discharge site at intake are being taken regularly.
- Discharge site New-I developed & discharge measurement started w.e.f 24.11.09.
- Discharge Site (New-II, Temp.) on new proposed Barrage site at Tidong khad established & discharge measurement started w.e.f 01.12.09.
- Detailed survey work completed.
- Other investigation works like drilling and drifting are in progress.
- The layout of project has been revised and under finalisation

3. Statutory Clearance:

- The case for Environmental clearance by MoEF submitted and presentation made to Expert Appraisal Committee of MoEF on 29.07.09. Observations are being attended to.
- Work for EIA /EMP a/w social baseline studies awarded to ICFRI, Dehradun on 15.10.09.

(c) Himurja: Apart from above, 100.00 MW power capacity addition is expected with the commissioning of Mini/Micro hydel projects undertaken for execution by Himurja by the end of 11th Plan.

B. Private Sector: Under Private sector 15 projects are under execution and it is expected to add 1462.00 MW additional power capacity by the commissioning of following five projects by the end of 11th plan.

1. KARCHAM-WANGTOO HYDEL PROJECT (1000MW):

Karcham-Wangtoo Hydel Project has been contemplated as a power generation development on Satluj river in District Kinnaur of Himachal Pradesh. The project has been allotted to M/S Karcham Hydro Corporation Ltd. New Delhi. The estimated cost of the project is Rs.5910 Crore. The annual generation of this project has been envisaged 4560 MU. The MOU for the execution of the project was signed between the HP Govt. and M/s Jai Parkash Industries Ltd., New Delhi on 28.8.93 and implementation agreement was signed on 18.11.99 followed by a Tripartite Agreement between the Govt. of HP, M/s Jai Parkash Industries Ltd., and M/s Jaypee Karcham Hydro Corporation Ltd., on 30.12.2002. As per the progress report, the company has completed river diversion. The excavation in progress for the following components. Intake tunnel, MAT, Power House, Desilting tank, Surge gallery, Diversion Tunnel Upstream Cofferdam, Main Dam spillways and HRT, Surge chamber. The project is scheduled for commissioning in 2011-12.

2. ALLIAN DUHANGAN HYDEL PROJECT (192 MW):

Allian Duhangan Hydel Project has been contemplated as a power generation development on Allian Duhangan a tributary of Beas river in District Kullu of Himachal Pradesh. The project has been allotted to M/s Allian Duhangan Power Corporation Ltd. Prini, Manali. The estimated cost of this project is Rs.922.36 Crore. The annual generation of this project will be 678 MU. The MOU for execution of the project was signed between the HP Govt. and M/s Rajasthan Spinning and Weaving Mills Ltd., New Delhi on 28.8.93 & implementation agreement signed on 22.2.2001. The CEA has accorded TEC on 20.8.2002. The Company was required to start the construction work of the project within 36 months of the I.A i.e. 22.2.2004 after achieving the financial closure. The company failed to achieve financial closure and start the construction work by the due date. The Govt. vide letter dated 4.8.04 had

asked the company to start the construction work on the project within 6 months i.e. by 5.2.2005 after getting the tripartite agreement signed. The GoHP signed quadripartite agreement on 5.11.05 between the Govt. of H.P, M/s Rajasthan Spinning & Weaving Mills Ltd., M/s MPCL and the Generating Company M/s AD Hydro Power Ltd. As per the progress report, following works have been completed :-

Excavation of Power House main Cavern, HRT, Transformer Cavern, Pressure Shaft Adit 1, Adit 2, other infrastructural works, concreting of Power House. Transformer Cavern, Allain Barrage, Concreting of Intermediate Reservoir, Head Regulator are in progress. The project has been scheduled for commissioning during 2010.

3. Malana-II HEP (100 MW):

Manala-II Hydro-Electric Project has been contemplated a power generation development on Malana a tributary of Beas river in Kullu District of Himachal Pradesh. The project has been allotted to M/s Everest Power Pvt. Ltd., New Delhi. The estimated cost of the project is Rs.633.47 Crore. The annual generation capacity of this project has been targeted as 428 MU. The MOU & IA signed with the company on 27.5.2002 & 14.1.2003 respectively. The company M/s Everest Power Pvt. Ltd., submitted the modified contents of DPR during Jan.,2002 on the basis of observations raised by the HPSEB on examination of DPR. The company has obtained TEC on 15.10.2004. However, in an arbitration case titled M/s MPCL V/s State of H.P & others, the Arbitrate Tribunal has passed an order that “M/s Everest Power Pvt. Ltd.,” shall be at liberty to take the steps for getting the required clearances from the authorities concerned including DPR but the actual construction work on the project shall not start except with the permission of the “Arbitration Tribunal”. The stay imposed by the Hon’ble Arbitral Tribunal vide order dated 06.08.03 on construction work of the project in the case titled M/s MPCL V/s State of HP and others, was vacated vide order passed by the Hon’ble Arbitral Tribunal on 28.05.05, allowing the Company to go ahead with the construction on the project. As per the progress report, the company has completed work on Main Access Tunnel, TRT & Manifold-I & II, Bus duct, Transformer Cavern, Adit-I to Adit-6, Pressure Shaft and Diversion Channel. The work on Power House cavern (Machine Hall), Head Race Tunnel, Pressure Shaft (Vertical), Concrete dam excavation, Dam drift and Surges Shaft is in progress. The company has achieved various mile stones with in the time schedule. The project is slated for commissioning in 2010.

4. Budhil Hydro Electric Project (70 MW):

Budhil Hydro Electric Project (70 MW) has been contemplated as a power generation development on Budhil Khad a tributary of the Ravi river in Chamba District of Himachal Pradesh. The project has been allotted to M/s Lanco Green Power Pvt. Ltd. New Delhi. The estimated cost of the project is Rs. 418.80 crore. The annual generation capacity of this project has been envisaged as 313.3 MU. The

Memorandum of Understanding (MoU) has been signed on 23.09.04. The H.P. Govt. has signed the implementation agreement (I.A.) with the company on 22.11.2005. The project is slated for commissioning in 2011-12.

5. Sorang Hydro Electric Project (100 MW):

Sorang Hydro Electric Project (100 MW) has been contemplated as a power generation development on Sorang a tributary of Satluj river in Kinnaur District of Himachal Pradesh. The project has been allotted to M/s Himachal Sorang Power Pvt. Ltd. The estimated cost of the project is Rs. 586 crore and annual generation of this project will be 524 MU. The Memorandum of Understanding (MoU) and Implementation Agreement (I.A) have been signed on 23.09.2004 and 28.01.2006 respectively. The Detailed Project Report (DPR) submitted by the company on 13.05.2005 for an enhanced capacity of 100 MW, has been techno-economically cleared on 09.06.06 by the HPSEB for an estimated cost of Rs. 586 crores. The Govt. has signed the Implementation Agreement (I.A.) with the company on 28.1.2006. The construction of infrastructure works and excavation of powerhouse is underway. The project is slated for commissioning in 2011-12.

C. Joint / Central Sector: By the end of 11th plan, joint/ central sector is expected to add 1831.00 MW additional power capacity with the commissioning of following three projects by the end of 11th plan:-

1. Parbati-II Hydro Electric Project (800 MW):-

Parbati-II Hydro Electric Project (800 MW) has been contemplated as a power generation development on the Beas river in Kullu district of Himachal Pradesh. The project has been allotted to National Hydro-electric Power Corporation (NHPC)Ltd., Faridabad. The annual generation of this project will be 3109 M.U.

The contracts of main packages i.e. Dam works, Trench Weir and Feeder Tunnel, Power House, Surge Shaft, Jiwa Nallah works and Hydro-mechanical equipment have been awarded to five companies who have taken up/ started the work at different locations/ project components and the construction work is in full swing. The infrastructural development works i.e. c/o residential and non-residential buildings, approach roads and bridges etc. have almost been completed.

2. Chamara-III Hydro Electric Project (231 MW):-

Chamera-III Hydro Electric Project (231 MW) has been contemplated as a power generation development on the Ravi river in Chamba district of Himachal Pradesh. The project has been allotted to National Hydro-electric Power Corporation (NHPC)Ltd., Faridabad. The Implementation Agreement (I.A.) has been signed on 05.07.01. The estimated cost of the project is Rs. 1364.01 crore. The annual generation capacity of this project will be 1104 M.U.

The land acquisition for the project is in progress. The provisional clearances for diversion of 96.145 hectare forest land has been accorded by the Ministry of Environment & Forest (MOEF) on 8/15.06.04. Cat Plan sent to Ministry of Environmental Clearance accorded by Ministry of Environment & Forest (MOEF) on 10.03.2005. The site development works for power house and dam site, infrastructural works construction of project roads and bridges are in progress. The likely year of commissioning is 2010-11.

3. Koldam Hydro Electric Project (800 MW):-

Koldam Hydro Electric Project (800 MW) has been contemplated as a power generation development on the Satluj river in Bilaspur district of Himachal Pradesh. The project has been allotted to National Thermal Power Corporation Ltd., New Delhi. The estimated cost of the project is Rs. 4527.15 crore. The annual generation of this project will be 3338.61 M.U.

The infrastructural activities of the project has been completed. The contracts for all major packages have already been awarded and the construction work is in full swing.