INITIATING COVERAGE

LARGE CAP

NHPC (Underperformer)

16 February 2010

Excess cash depressed returns

NHPC, the largest Indian hydro power company operates 13 power plants totaling 5.2 GW (including JV capacities). The company aims to double its capacity over the next six years by adding 4.6 GW, through 11 hydro projects currently under execution.

Year ending March	FY08	FY09	FY10E	FY11E	CAGR (%)
P&L Data (Rs mn)					**(FY08-11E)**
Net Sales	24,757	29,231	45,546	41,140	18.4
EBITDA	18,907	19,171	35,770	30,729	17.6
Adjusted Net Profit	10,604	14,012	14,623	15,116	12.5
Margins (%)					
OPM	76.4	65.6	78.5	74.7	(0.7)
NPM	40.5	43.2	29.7	33.5	(6.1)
Balance Sheet Data (Rs mn)					
Total Assets	309,989	348,205	428,945	465,221	14.5
Shareholders' Funds	171,157	178,718	234,705	244,650	12.6
Per Share Data (Rs)					
EPS	0.9	1.3	1.2	1.2	9.0
Returns (%)					
RoE	6.2	7.8	6.2	6.2	–
RoCE	5.9	5.7	7.6	5.7	–

- **Low RoEs:** Although NHPC earns 15.5% RoE on equity in hydro-electric projects, the book RoE drops to a dismal 6-7% (see table above) due to capital inefficiencies i.e. high cash and capital WIP. Moreover, hydro projects having long gestation periods further dampen return ratios.
- **Slow capex:** The current round of expansion of 4.6 GW will end by FY16. There is no clarity on future expansions even though NHPC has adequate cash to invest.
- **High cash:** The total cumulative cash available as of FY10E is at 2.2x the equity requirement for planned project expansions between FY10-16. Yet there does not appear to be any plans of speedy capex.

Given the above factors of sluggish growth and a tendency to accumulate cash without efficient reinvestment, the return ratios and growth numbers are disheartening. We expect no foreseeable change in any of these factors in the future and given the current high prices, find the stock expensive. **Our SOTP based target price of Rs 30.3 values the stock at 1.5x FY11E implied book value. Initiate with Underperformer.**

Share Data

Market Cap.	Rs 395.5 bn (US$ 8,537 mn)
Price	Rs 32
Target Price	Rs 30
BSE Sensex	16,038
Reuters	NHPC.NS
Bloomberg	NHPC IN
3M avg. daily turnover (US$ mn)	9.7
52-week High / Low (Rs)	42 / 29
Issued Shares	12,301 mn

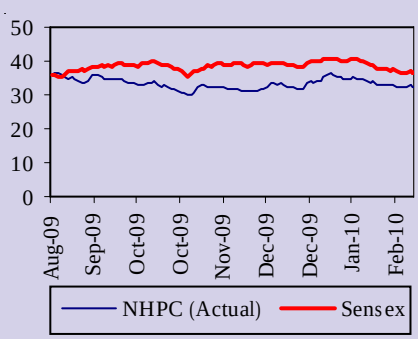
Valuation Ratios

Yr to 31 Mar	FY10E	FY11E
EPS (Rs)	1.2	1.2
+/- (%)	(5.1)	3.4
PER (x)	27.0	26.2
Dividend / Yield (%)	1.1	1.1
EV / Sales (x)	10.4	12.0
EV / EBITDA (x)	12.0	14.2

Shareholding Pattern (%)

Promoters	86
FIIs	2
MFs	1
BFSI's	3
Public & Others	8

Relative Performance



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Attention is drawn to the disclaimer and other information on Page 2

Analyst Declaration: We, Subhadip Mitra, Snehil Saraf & Amit Singh, hereby certify that the views expressed in this report accurately reflect our personal views about the subject securities and issuers. We also certify that no part of our compensation was, is, or will be, directly or indirectly, related to the specific recommendation or view expressed in this report.

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Investment arguments

SWOT analysis

Strengths	Weakness
Strong generation base in hydro-power – superior technological know-how, potential to ramp up capacities.	Historically slow in execution and plagued by inordinate time delays in commissioning plants. Bureaucratic and regulatory entanglement has continuously delayed expansion.
Strong balance sheet with free cash of Rs 70 bn FY10E provides ample funds for large capacity addition.	Long gestation of projects coupled with delays has deflated return on capital.
Opportunities	**Threats**
Deploy the excess cash, add more hydro capacity and diversify into thermal power development.	Unproductive or unemployed shareholders funds are high. RoE's will remain low unless there is redeployment of funds into capacities.
Central government directive on merchant power regulation for state run power utilities can contribute to bottom line.	Delays in identifying and executing hydro power projects could lead to un-viability of such projects due to cost escalation.

RoE would increase by Rs 1 bn under new norms on existing projects

- **Favourable RoE's under new tariff norms (refer Annexure IV for details)**

  The new tariff norms prescribed by CERC for the period FY10-14 have increased the regulated RoE's to 15.5% (earlier 14%), with an additional 0.5% (total 16%) for timely project completion (for projects commissioning on or after 01 April 2009). As per our estimates the RoE hike of 1.5% alone adds **Rs 1 bn to the PAT figure (base equity of Rs 68 bn invested in operational projects as of FY09).** Moreover, further commissioning of new projects FY10 onwards will contribute to higher profits.

- **IPO funds plus yearly cash earnings provide huge potential for growth**

  NHPC's capacity expansion of 4.6 GW by FY16 requires equity of Rs 69 bn assuming debt-equity ratio of 70:30. Of this Rs 36.5 bn has already been deployed while the balance requirement of Rs 32.5 bn can be funded from the cash on books of Rs 19 bn (FY09) and IPO funds of Rs 40 bn. Hence, the company is unlikely to face any delays in project execution at least on account of paucity of funds. We see no further equity dilution in the imminent future.

Refer Annexure IV for detailed explanation on tariff norms

- **Split-up of Annual Fixed Charges to hedge recovery risk**

  Under the new norms the annual fixed charges are split equally into capacity charge and energy charge. The recovery of costs under these heads is dependent on normative plant availability factor (NAPAF) and the Design Energy (DE), respectively, which are independent of each other. Due to this a less than normative performance under one variable may not imply an under-performance under the other. Hence, a plant may exceed the benchmark NAPAF while generating less than DE or vice versa, allowing it to earn incentives under one category while recovering less than the standard charges under the other. **However, since performance parameters are more stringent now, NHPC may face shortfall under one category and gain under another, leading to largely stagnant RoE's.**

- **Green benefits and Merchant Power in new projects:** The company has the potential to earn through CERs and VERs, however currently this is quite miniscule. If the current proposal of the government to have merchant sale on part of its quota (of 15%) of all central utilities goes ahead, NHPC will benefit. However, there is no clarity on this issue yet.

Investment risks

- **New CERC norms mandate stricter efficiency for incentives**

  The new CERC norms for hydro projects mandates stricter efficiency norms by making the last few years average plant availability as the normative availability factor i.e. the threshold for earning 15.5% RoE beyond which incentives are applicable. Since hydro plants are at the mercy of nature for water flow, the incentive gains on power generation is beyond control.

Tariff norms (Old versus New) – (refer Annexure IV for details)

Tariff norms	Old	New
RoE	14%	15.5%
Threshold	Based on availability of plant (PAF) regardless of actual water flow ensuring the plant earns minimum mandated RoE.	Tariff is divided equally into **Energy Charge and Capacity Charge. Capacity Charge** has a threshold **NAPAF** while **energy charge** is dependent on **Design Energy** (as decided by CERC on a plant wise basis). Hence if generation is lower than NAPAF or DE, then the plant will not even earn the minimum RoE. This can even happen when plant is available but there may not be enough water flow.
Incentive / Secondary energy	Any generation by the plant over & above the design energy is considered as excess which is sold at the same rate as the primary energy. Hence all fixed costs of the plant are recovered at the design energy level, while any excess earns extra at the same rate per kWh.	Only if the plant has a PAF higher than NAPAF or energy generated is higher than DE or both it will earn incentive in proportion to the fixed cost (AFC). **There is no provision for secondary energy.**

Note: New Norms

- Since **there is 50% weightage** to Energy Charge & Capacity Charge, the plant stands to earn under one or both. **Conversely a lower than threshold achievement would mean a lower than mandated recovery under each of the above.**
- Further, under the new norms the **onus is on actual generation of a hydro-electric power plant** where **as under the older norms a plant could recover the entire capacity charge if it was available for generation**. The availability of water or insufficient water flow did not matter. Hence, under the new norms, **a hydro electric power plant is adversely affected if the water flow is insufficient as the recovery of capacity and energy charge** is directly related to the actual operation of a plant.

- **Capital invested in non-revenue accruing activities**

  Although NHPC earns 14.7% RoE on its equity invested in operational hydro projects, **the book RoNW drops to a dismal 7.84% as of FY09.** This is because; **out of the total net worth of Rs 179 bn only Rs 96 bn is deployed in core operational activities.** The balance Rs 83 bn is deployed as cash, capital work-in-progress, other investments, loans & advances, etc. The difference in returns is visible from the table.

Return on Core Activities versus Net Worth

(Rs mn)	FY09	FY10E	FY11E	FY12E
Net worth	**178,718**	**234,705**	**244,650**	**256,610**
In core operational activities				
Hydro projects (Regulated Equity)	67,763	67,930	71,272	89,844
Equity investment in NHDC	10,024	10,024	10,024	10,024
Tax free power bonds	17,780	15,240	12,700	10,160
Total	**95,567**	**93,194**	**93,996**	**110,028**
PAT / Core activities (%)	14.7	15.7	16.1	16.5
In non-core activities				
Cash	19,000	70,071	76,496	87,247
Other equity investments	132	132	132	132
Loans & Advances	12,649	12,649	12,649	12,649
Construction Stores & Advances	10,969	10,969	10,969	10,969
Capital work-in-progress	40,402	47,691	50,409	35,587
Total	**83,151**	**141,511**	**150,654**	**146,583**
Grand total	**178,718**	**234,705**	**244,650**	**256,610**
PAT / Total net worth (%)	7.8	6.2	6.2	7.1

Source: B&K Research

Cash
FY09 – Rs 19.0 bn
FY10E – Rs 70.0 bn
FY11E – Rs 76.5 bn

- **Excessive cash balance**

  The total cumulative **cash available as of FY10E is almost 2.2x the equity requirement for planned project expansions up to FY16.** If we add the PAT (based on RoE % of operational projects as of FY09), we estimate NHPC to earn Rs 10.5 bn annually. This is assuming a RoE of 15.5% during the period FY10-14. The new projects would continue to add to the PAT as they get operational. Such huge regular free cash flows if not re-deployed into further capex will continue to drag RoEs.

- **Loss of RoE in construction period**

  Hydro electric projects typically have a longer gestation period when compared to that of thermal power stations. In the case of a HEP it takes anywhere between six-seven years, whereas it is only three-five years for a thermal power project. The longer gestation period means equity is employed for a longer period as CWIP, earning no returns. **The problem is further aggravated in case of NHPC as it continues to invest higher than the mandated 30% equity during the construction phase of HEP, to be later substituted by debt. As of FY09 equity deployed stands at 43% of CWIP.**

- **Higher equity contribution in projects**

  Historically, in the older projects, NHPC has put in equity in excess of 30% but due to relaxation under older norms it is able to earn RoE on the entire equity deployed. However, under the new CERC norms debt-equity ratio is mandated at 70:30, **treating any equity deployed above 30% as debt (which earns only 8-9% as per SBI PLR).**

  However, under the present norms if NHPC continues to deploy higher than 30% equity, the excess will earn lower returns, further depleting the return to the shareholders of NHPC.

- **Delay in execution of projects**

Built-in a delay of three months on projects under construction

The Sewa II project coming up in February 2010 was scheduled to come up in December 2009 as per the RHP of NHPC. The original date for commissioning of the project as per cabinet approval was in September 2007. Project delays have been an inherent problem as far as NHPC is concerned. The latest estimates as per Infraline show delay of 4-7 months in Chamera III, Nimoo Bazgoo and Parbati III. For the other **projects coming up FY12 onwards we have built in a delay of three months over NHPC RHP.** The table below gives the likely commissioning dates for the various projects.

Project commissionung schedule

Power station	Capacity	Date of commissioning			
	(MW)	Cabinet Schedule	NHPC RHP	Infraline Estimate	B&K Estimate
Sewa II	120	September 2007	December 2009	February 2010	February 2010
Teesta Low Dam Stage III	132	March 2007	February 2011	February 2011	May 2011
Uri II	240	November 2009	February 2011	February 2011	May 2011
Chamera III	231	August 2010	August 2010	December 2010	December 2010
Teesta Low Dam Stage IV	160	September 2009	August 2011	August 2011	November 2011
Nimoo Bazgo	45	August 2010	August 2010	December 2010	December 2010
Parbati III	520	November 2010	November 2010	June 2011	June 2011
Parbati Stage II	800	September 2009	March 2013	March 2013	June 2013
Chutak	44	February 2011	February 2011	February 2011	May 2011
Subansiri Lower	2,000	September 2010	December 2012	750 MW – March 2012, 1250 MW – December 2012	750 MW – June 2012, 1,250 MW – March 2012
Kishenganga	330	January 2016	January 2016	January 2016	January 2016
Total	**4,622**				

Source: NHPC RHP, Infraline, B&K Research

- **Lack of clarity on future expansion**

The current round of expansion of 4.6 GW will be primarily funded by the existing cash on books and the IPO funds. The incremental cash flow generated from the existing operation would be free for reinvestment. Lack of expansion post FY16 would affect the long-term return on equity deployed as more and more cash is going to lie invested in non-core activities.

SOTP

Hydro Power DCF	23.3
51% JV NHDC	1.2
Tax Free Power Bonds	1.2
Cash	4.6
Total SOTP	**30.3**

Outlook and valuation

- We have valued NHPC on a DCF basis, accounting for the existing capacity and the 4.6 GW of hydro-electric projects coming up to FY16. As per our estimates NHPC will have a capacity of 6.7 GW (including JVs) by FY12 and 9.5 GW (including JVs) by FY16. Given lack of clarity beyond FY16, **we assume a growth of 500 MW each year between FY17-22, which is the average of historic and planned addition by NHPC between FY02-17**.
- All its power would be sold through long-term PPA's earning a fixed RoE of 15.5%. We assume average delays of three months for all projects coming FY12 onwards.
- Our DCF of the power business under these assumptions comes to Rs 23.3 per share, to which we add value of investment in 51% subsidiary NHDC (at 1.5x equity investment by NHPC). Cash (valued at 80%) and tax free power bonds together contribute ~20% at Rs 5.8 to the total **SOTP value of Rs 30.3 per share.**
- Our DCF based target values the stock at 1.5x implied book value FY11E while it currently trades at 1.7x the market price. **We initiate with Underperformer given the current high stock price, depressed RoE and limited growth triggers.**

Comparison with NTPC

Peer group evaluation

	Return on Equity (%)			PAT growth (%)			Actual P/BV (x)		
	FY10E	FY11E	FY12E	FY10E	FY11E	FY12E	FY10E	FY11E	FY12E
NHPC	**6.2**	**6.2**	**7.1**	**4.4**	**3.4**	**20.3**	**1.7**	**1.7**	**1.6**
NTPC	14.4	14.2	14.4	6.2	7.6	11.0	2.7	2.4	2.2

Source: B&K Research

NHPC trades at a significant discount to the P/BV multiple of its closest peer NTPC. The market currently values NHPC at a P/BV of 1.7x FY11E, where as NTPC is trading at a P/BV of 2.4x FY11E. The reason for this significant discount is the fundamental difference in the business model of NHPC.

Even though both NHPC and NTPC have about the same proportion of equity invested in capital work-in-progress, inherently NTPC is better off in terms of RoE and growth based on the following reasons:

- NTPC's RoE on operational equity is 22-23% because of the higher incentive structure for thermal power plants. NHPC is earning just about the mandated 15% RoE on operational equity
- The difference in RoE's earned is the main reason for the difference in book RoE which is at 6.2% FY 11E for NHPC and 14.2% FY 11E for NTPC. Further the long gestation period for a hydro project is an additional drag on book RoE's and growth rates.

Power scenario in India

Power is an important infrastructural sector of an economy, being the key driver for the economic development of a country and for enhancing the quality of life. According to the projections of investment in infrastructure during the 11th plan, the power sector is expected to attract an investment of US$ 176.91 bn of the total US$ 581.68 bn earmarked for investment in infrastructure.

Historically, India has been a power deficit country experiencing shortages in energy and peak power requirements. The country experienced 11% energy deficit and 12% peak power deficit in Fiscal 2009.

Power deficit in India

Period	Peak demand (MW)	Peak met (MW)	Peak Deficit/ Surplus (MW)	Peak Deficit/ Surplus (%)	Energy requirement (MU)	Energy availability (MU)	Energy Deficit/ Surplus (MU)	Energy Deficit/ Surplus (%)
9th plan end	78,441	69,189	(9,252)	(11.8)	522,537	483,350	(39,187)	(7.5)
2002-03	81,492	71,547	(9,945)	(12.2)	545,983	497,890	(48,093)	(8.8)
2003-04	84,574	75,066	(9,508)	(11.2)	559,264	519,398	(39,866)	(7.1)
2004-05	87,906	77,652	(10,254)	(11.7)	591,373	548,115	(43,258)	(7.3)
2005-06	93,255	81,792	(11,463)	(12.3)	631,757	578,819	(52,938)	(8.4)
2006-07	100,715	86,818	(13,897)	(13.8)	690,587	624,495	(66,092)	(9.6)
2007-08	108,866	90,793	(18,073)	(16.6)	739,345	666,007	(73,338)	(9.9)
2008-09	109,809	96,685	(13,124)	(12.0)	774,324	689,021	(85,303)	(11.0)
April-June 2009	111,066	97,355	(13,711)	(12.3)	202,238	182,412	(19,826)	(9.8)

Source: CEA Power Scenario at a Glance, June 2009, B&K Research.

Considering the GDP growth rate and the changing consumer pattern a significant ramp-up in generation and peak capacity is required to meet the power requirements of the country. The per capita consumption of power has increased form 566.7 kWh/year in 2002-03 to 704.2 kWh/year in 2007-28, at a CAGR of 4.4% from 2002-03 to 2007-08. Still the consumption in India is very low when compared to the rest of the world.

According to the 17th EPS report, India's energy requirement will post a CAGR of 7.1% over a period of 10 years (Fiscal 2007 to Fiscal 2017). As per the report, to meet this energy demand, the corresponding installed generating capacity required would be about 300,000 MW in Fiscal 2017. India's additional energy demand for the next decade is projected to be among the highest in the world.

Installed capacity to meet demand

Year	Projected peak demand (GW) @ GDP growth rate		Installed capacity required (GW) @ GDP growth rate	
	8%	9%	8%	9%
2011-12	158	168	220	233
2016-17	226	250	306	337
2021-22	323	372	425	488
2026-27	437	522	575	685
2031-32	592	733	778	960

Source: Government of India Integrated Energy Policy, Report of the Expert Committee (August 2006).

Capacity additions

The generation capacity of power in India has increased from 1,750 MW in 1950 to about 150,323 MW as of 30 June 2009. The majority of this capacity comprises of thermal (96,055 MW, ~64% of total generation capacity) and hydropower (36,917 MW, ~25% of total generation capacity). Nuclear and renewable energy contribute ~3% and 9%, respectively. The state sector contributed 51% of total power generated, while 33% and 17% was from the central sector and private sector, respectively.

In the 10th Plan (2002-07), the actual capacity addition is at 21,180 MW against the target capacity addition of 41,110 MW. The actual capacity additions have lagged behind the targeted additions since the VII Plan. The failure to meet capacity addition targets has widened the demand and supply gap, which presents an attractive opportunity for the companies in the power generation space. The 11th Plan recommends generation planning based on an estimated 9.5% growth in energy required each year with a capacity addition of 78,700 MW in the 11th Plan. Hydro Power capacity added during this period would be 15,627 MW (~20%) of the total capacity added during the 11th plan.

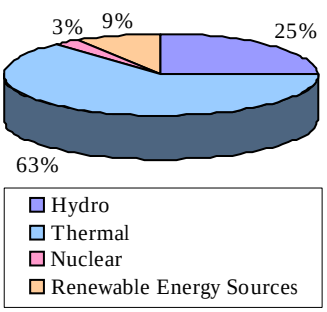
Fuelling the generation

Given the huge ramp up in power capacity which is planned in the 11th and 12th plan, ready access to fuel is a pre-requisite. While we have limited supply of nuclear fuel, and gas (even with the Krishna-Godavari-Mahanadi Basin), the only major fuel with large reserves in India is coal. Thus coal based generation is expected to be the mainstay for power capex at least for the next 8-10years.

But from a longer term perspective beyond the 12th Plan it is more important to have greener energy resources. While Nuclear power is a clean and economically viable source of power generation, we do not have the required fuel in India. With signing of the nuclear deal, India now expects to have a nuclear capacity of 20 GW by 2020.

Hydro power development has the biggest potential as a sustainable non-polluting source of power. **As per the CEA, the total potential of hydroelectric power generation in India is about 150 GW, which is equivalent to about 84 GW at 60% PLF**. Our current installed capacity is about 37 GW which is at only 25% of full potential.

Installed capacity distribution



Source: CEA, B&K Research

Potential hydro power capacity in India is 150 GW

Hydro power potential in India

Rising demand for power, insufficient fuel availability and concerns regarding greenhouse gas (GHG) emissions by thermal power plants has led to a greater emphasis on hydro and other renewable sources of power generation, which are capable of providing a clean environment and that too at realistic rates.

The hydro power share has declined substantially from 34 per cent in 1985 to 25% as on May 2009. The ideal hydro thermal mix is established in the ratio of 40:60. Under the 50,000 MW Hydro Initiative by the Government, 77 schemes (of 33,951 MW) have been initiated for S&I (Survey & Investigation) and DPR stages. The remaining schemes are held up due to non-availability of clearances from the various state governments and other statutory clearances.

According to estimates on Hydro Electric Potential Development by CEA, India has a total identified capacity of 148,701 MW. Of this 145,320 MW has been identified for capacity of 25 MW and above. The following table summarises region wise potential and the stage of development for hydro electric power.

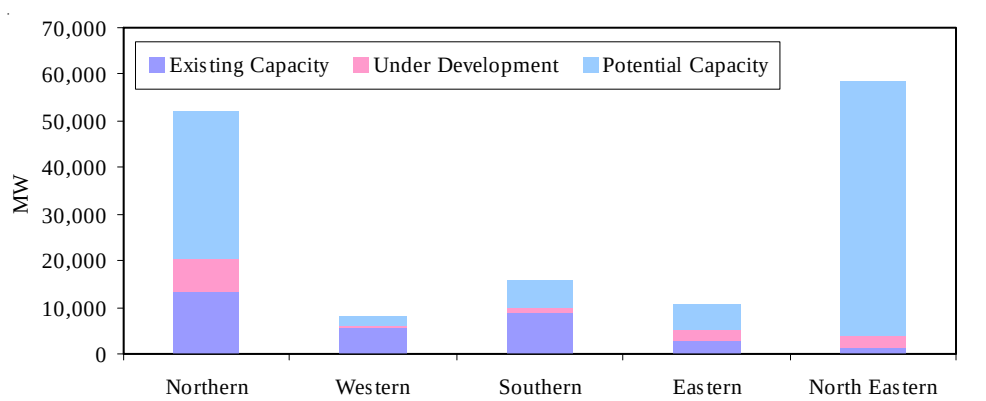
Region-wise hydro generating capacity

Region	Identified capacity		Capacity developed		Capacity under construction		Capacity developed + Under construction		Capacity yet to be developed	
	MW	%	MW	%	MW	%	MW	%	MW	%
Northern	52,263	36	13,366	26	7,305	14	20,671	40	31,592	60
Western	8,131	6	5,552	68	400	5	5,952	73	2,179	27
Southern	15,890	11	9,136	57	787	5	9,923	62	5,967	38
Eastern	10,680	7	2,930	27	2,307	22	5,237	49	5,443	51
North Eastern	58,356	40	1,116	2	2,876	5	3,992	7	54,364	93
Total	**145,320**	**100**	**32,100**	**22**	**13,675**	**9**	**45,775**	**31**	**99,545**	**69**

Source: CEA, Status of Hydro Electric Potential Development, B&K Research.

According to the CEA, these areas have been historically abundant in hydro electric potential. Even after the expansion there is enough capacity yet to be developed in these areas.

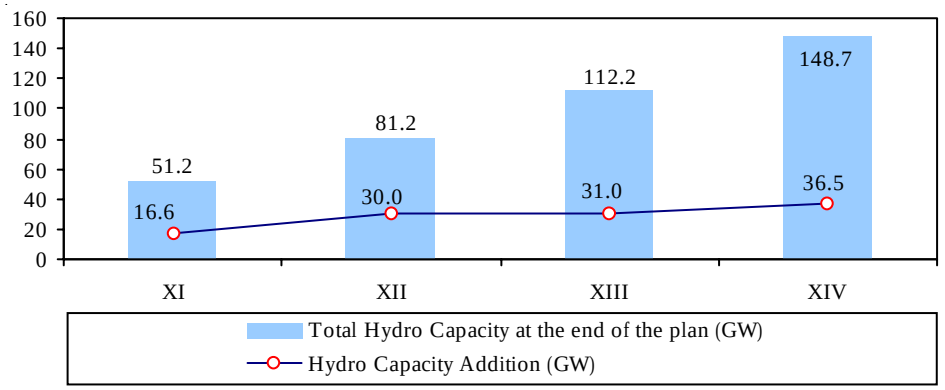
Hydro power potential – India



Source: CEA, Hydro Electric Potential, B&K Research

To utilise this potential, the government through its five year plans has come out with a strategy to utilise the total hydro electric potential of India by the end of 14th Five Year Plan (2026-27).

Long-term capacity addition plan



Source: MoP, B&K Research

Impediments in hydro power development

- **Longer gestation period and capital intensive nature of the projects:** Preparation of detailed projects reports (DPRs) for hydro power projects takes comparatively longer time than for thermal projects, because technological improvements are required in seismic prediction to access the geological conditions (underground) so as to reduce the geological surprises. On priority basis, thermal plants are getting fund allotments due to their shorter gestation periods.
- **Time and cost overruns:** This can happen due to improper perception of the project, lack of good infrastructure facilities, skilled manpower and good liquidity of the contractor.
- **Inter-state aspects:** Most of the hydropower projects share their river systems involving adjacent states and are held up on account of inter-state disputes. Even CEA clearance is not been given for such disputed projects.
- **Resettlement and Rehabilitation (R&R) issues:** This is for the project affected people and is one of the main reasons for delay in projects and sometimes abandonment of the project altogether. Sardar Sarovar, Indira Sagar, Bansagar Tons and Tehri are some of the hydro projects where the development had been severely impacted in the past.
- **Law and order problems:** This is because most of the project locations come under insurgency affected areas. Some of the hydro power projects affected due to these problems are Dulhasti, Upper Sindh, Doyang and Dhansiri.
- **Land acquisition problems:** Thein Dam, Doyang and Ghatgar pumped storage plants are some of the projects affected in the past due to this problem.

Company profile

NHPC Limited, a Government of India enterprise is the largest hydro power generating company in India. It has three major sources of revenue – Hydro Power Generation, Project Management & Consultancy Works and Interest on Power Bonds & Long-Term Assets.

	MW
Installed capacity	*5,175*
Under construction	*4,622*
Total FY17 (incl. JV's)	*9,797*

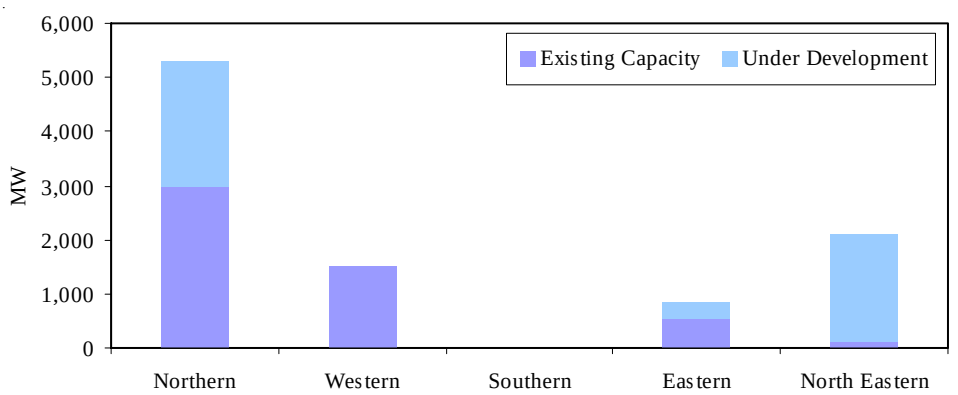
NHPC is expected to increase the total installed capacity by 4,622 MW to 9,797 MW by FY17. Of this around 1,492 MW is expected to come up by the end of the 11th Five Year Plan. The balance of 3,130 MW would come up by the end of 12th Five Year Plan.

The existing 5,175 MW (Annexure I) and the 4,622 MW (Annexure II) under construction is entirely hydro based. NHPC sells its power through long-term PPA's with state distribution agencies. The tariff for the sale of power is calculated as per the CERC tariff norms which are on a fixed RoE basis. The upsides are limited to incentive gains from efficiency in operations. All the energy generated is sold on a long-term PPA basis and there is no merchant power component. The existing said projects are operating at a plant availability factor of greater than 90%. **Despite this the electricity generation has varied over the years due to the unpredictability in water flow.**

Geographical distribution of Power Assets

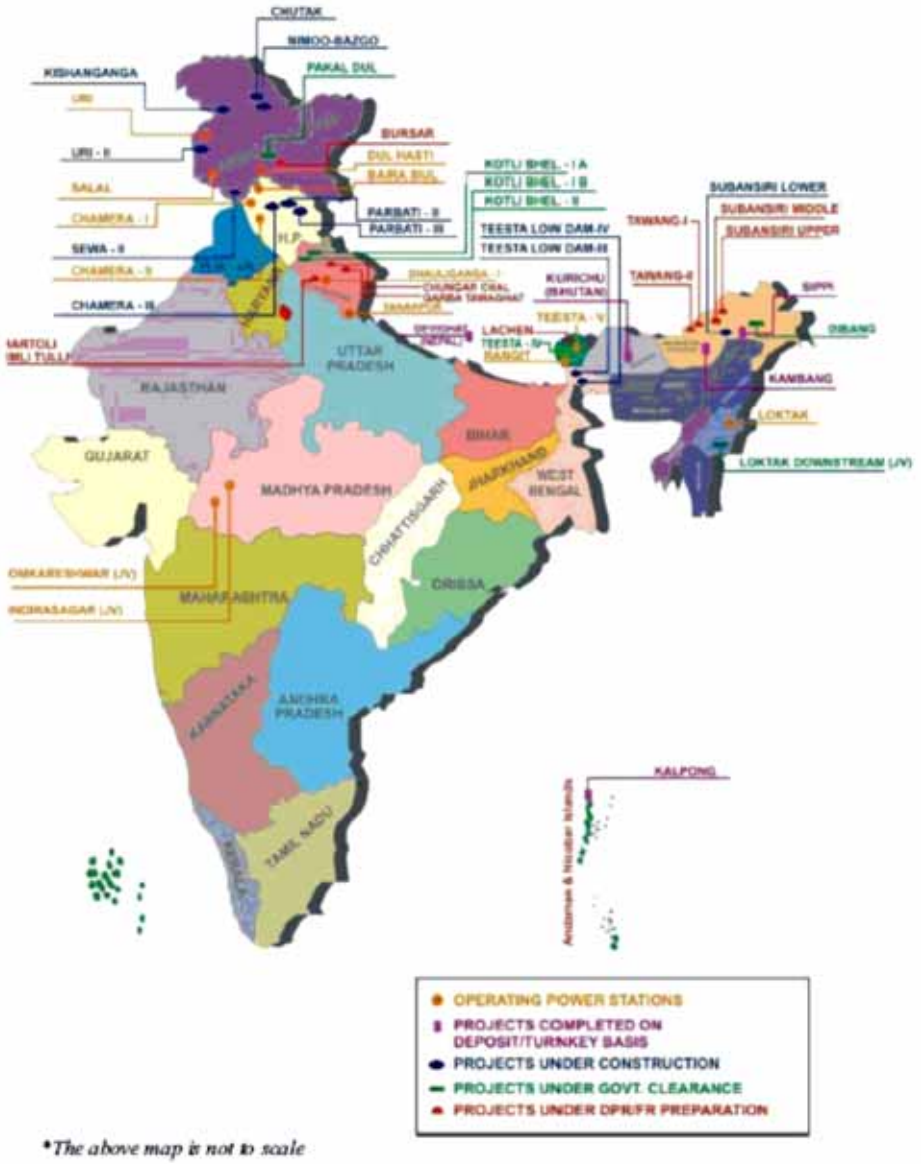
The existing power generating stations of the company is concentrated in the Northern and Western Region with over 4,500 MW (~87%) of the assets located here. After the capacity expansion around 6,830 MW (~70%) of the power portfolio is going to be located in these regions. A significant capacity addition of 2,105 MW (~21%) would also take place in the North-eastern region.

NHPC asset distribution



Source: NHPC RHP, B&K Research

Project profile of NHPC



The above map is not to scale

Source: NHPC RHP

Available capacity is the capacity available for generation for the year on a pro-rata basis

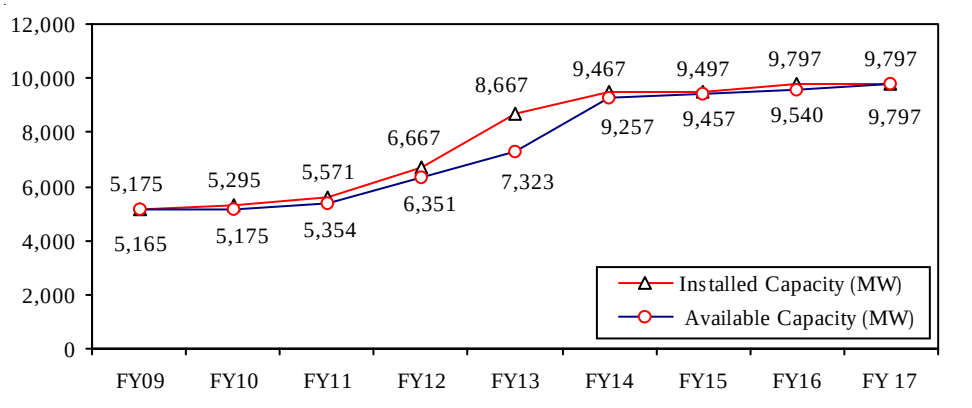
The table below depicts the hydro power capacity of NHPC's at the end of 12th Five-Year Plan. With an investment layout of nearly Rs 230,000 mn till 2016 the total installed capacity would increase by 4,622 MW to 9,797 MW. The table below depicts the total generation capacity at the end of the each fiscal year. The available capacity column shows the generation capacity available for the year, pro-rating for projects achieving operational status mid-year.

NHPC power capacity

	Installed capacity	Available capacity
FY09	5,175	5,165
FY10E	5,295	5,175
FY11E	5,571	5,354
FY12E	6,667	6,351
FY13E	8,667	7,323
FY14E	9,467	9,257
FY15E	9,497	9,457
FY16E	9,797	9,540
FY17E	9,797	9,797

Source: NHPC RHP, B&K Research

Capacity ramp-up



Source: NHPC RHP, B&K Research

3QFY10 result highlights

FY10E sales include Rs 6.1 bn of recovery from previous year sales

- Net sales increased by 162.8% YoY for the quarter since it included ~Rs 6.1 bn from finalisation and revision of tariff on account of prior year sales.
- Results are not comparable on QoQ basis due to seasonality of business (1Q and 2Q have good water flow while 3Q and 4Q are lean periods).
- Other income also increased by 118.3 % to Rs 1,463 mn on account of treasury income on the Rs 40 bn of IPO proceeds.
- Although reported PAT is Rs 5,816 mn for the quarter (versus last year's loss of Rs 539 mn). When adjusted for Rs 6,109 mn (PAT impact of prior year sales) PAT for 3QFY10 shows a loss of Rs 293 mn which is in tandem with seasonality of the business.
- Even though there has been no capacity addition until 3QFY10, depreciation has increased by 109.9% to Rs 275.6 mn on a YoY basis. This has been primarily been due to the increase in depreciation rates under the new tariff norms and the clubbing of "Depreciation Expense" and the "Advance against Depreciation" account into "Depreciation Expense".

Financial highlights

(Rs mn)	3QFY10	3QFY09	YoY (%)	FY09	FY10E	YoY (%)	FY11E	YoY (%)	FY12E	YoY (%)
Net Sales	12,770	4,859	162.8	29,231	45,546	55.8	41,140	(9.7)	52,674	28.0
EBITDA	9,497	1,278	643.0	19,171	35,770	86.6	30,729	(14.1)	40,588	32.1
EBITDA margin (%)	74.4	26.3	–	65.6	78.5	–	74.7	–	77.1	–
Other Income	1,463	670	118.3	3,179	3,768	18.5	4,018	6.6	4,518	12.4
Interest	(1,113)	(1,318)	(15.5)	(5,052)	(5,730)	13.4	(5,894)	2.9	(9,662)	63.9
Depreciation	(2,756)	(1,313)	109.9	(5,175)	(10,383)	100.6	(10,912)	5.1	(13,848)	26.9
PBT	7,090	(683)	(1,137.9)	12,123	23,425	93.2	17,941	(23.4)	21,595	20.4
Tax	(1,274)	144	–	(1,157)	(2,694)		(2,825)	4.9	(3,416)	20.9
Reported PAT	5,816	(539)	136.2	10,965	20,732	89.1	15,116	(27.1)	18,179	20.3
Extraordinary items	(6,109)	582	–	3,046	(6,109)	–	–	–	–	–
Adjusted PAT (After extraordinary)	(293)	42	–	14,012	14,623	4.4	15,116	3.4	18,179	20.3
Adjusted PAT margin (%)	(2.3)	0.9	–	47.9	32.1	–	36.7	–	34.5	–
Adjusted EPS (Rs) post extra ordinary and fully diluted equity	(0.0)	0.0	–	1.3	1.2	(5.1)	1.2	3.4	1.5	20.3

Detailed financials

Income Statement

Yr end 31 Mar (Rs mn)	FY08	FY09	FY10E	FY11E
Net sales	**24,757**	**29,231**	**45,546**	**41,140**
Employee costs	3,249	4,925	5,516	5,862
Other operating Expenses	2,602	5,135	4,259	4,548
EBITDA	**18,907**	**19,171**	**35,770**	**30,729**
Depreciation	4,444	5,175	10,383	10,912
Other Income	1,430	3,179	3,768	4,018
EBIT	**15,892**	**17,175**	**29,155**	**23,835**
Interest paid	4,534	5,052	5,730	5,894
Tax (current and deferred)	1,215	1,157	2,694	2,825
PAT	10,143	10,965	20,732	15,116
Extraordinary expenses (donation)	461	3,046	(6,109)	0
Net Income	**10,604**	**14,012**	**14,623**	**15,116**
EBITDA margins (%)	76.4	65.6	78.5	74.7
PAT (%)	40.5	43.2	29.7	33.5

Balance Sheet

Yr end 31 Mar (Rs mn)	FY08	FY09	FY10E	FY11E
Sources of fund				
Share capital	111,822	111,802	152,059	152,059
Reserves & surplus	59,335	66,917	82,646	92,591
other non current liabilities	13,033	13,295	13,295	13,295
Loans	99,563	122,340	147,094	173,425
Total	**283,752**	**314,353**	**395,093**	**431,369**
Application of funds				
Fixed Assets				
Gross Block	206,228	214,283	220,937	241,104
less: depreciation	32,648	38,150	48,533	59,445
Net Block	**173,580**	**176,133**	**172,404**	**181,659**
Capital Work in Progress	72,492	104,227	138,472	162,027
Investments	30,492	27,936	25,396	22,856
Net Current Assets				
Currents assets (a)	**33,425**	**39,909**	**92,673**	**98,679**
Inventory	371	372	419	445
Sundry Debtors	3,311	2,947	4,591	4,147
Cash and Bank Balance	18,413	19,000	70,071	76,496
Loans and advances	7,760	12,649	12,649	12,649
Other non current assets	3,571	4,943	4,943	4,943
Less: current liabilities (b)	**26,236**	**33,852**	**33,852**	**33,852**
Other liabilities	26,236	33,852	33,852	33,852
(a-b)	**7,189**	**6,058**	**58,821**	**64,828**
Total	**283,752**	**314,353**	**395,093**	**431,369**

Cash Flow Statement

Yr end 31 Mar (Rs mn)	FY08	FY09	FY10E	FY11E
Pre-tax profit	11,819	15,169	23,425	17,941
Depreciation	4,458	5,183	10,383	10,912
Chg in debtors	(2,287)	(2,196)	(1,645)	444
Chg in inventory	(58)	11	(47)	(26)
Change in loans & advances				
Chg in other current assets	483	588	0	0
Chg in current liabilities	6,620	4,044	0	0
Chg in provisions	158	967	0	0
Total tax paid	(1,624)	(1,060)	(2,694)	(2,825)
Other operating activities	3,449	4,957	1,962	1,876
Cash flow from operations (a)	**23,019**	**27,663**	**31,385**	**28,322**
Capital expenditure	(25,564)	(31,547)	(40,900)	(43,721)
Chg in investments	2,735	2,556	2,540	2,540
Other investing activities	361	518	3,768	4,018
Cash flow from investing (b)	**(22,468)**	**(28,474)**	**(34,592)**	**(37,164)**
Free cash flow (a+b)	**551**	**(810)**	**(3,207)**	**(8,841)**
Equity raised/(repaid)	0	0	40,257	0
[incl. chg in share premium]				
Debt raised/(repaid)	22,263	15,604	24,753	26,331
Dividend (incl. tax)	(3,580)	(3,717)	(5,002)	(5,171)
Other financing activities	(5,490)	(7,777)	(5,730)	(5,894)
Cash flow from financing (c)	**13,193**	**4,111**	**54,279**	**15,266**
Net chg in cash (a+b+c)	**13,744**	**3,300**	**51,072**	**6,425**

Annexures

Annexure I – Existing projects

Power station	State	Installed capacity (MW)	Year of commissioning	Estimated design energy (MU's)
Baira Siul	Himachal Pradesh	180	1981	779
Loktak	Manipur	105	1983	448
Salal	Jammu & Kashmir	690	1987/1996	3,082
Tanakpur	Uttarakhand	120	1992	452
Chamera I	Himachal Pradesh	540	1994	1,665
Uri I	Jammu & Kashmir	480	1997	2,587
Rangit	Sikkim	60	1999	339
Chamera II	Himachal Pradesh	300	2004	1,500
Dhauliganga I	Uttarakhand	280	2005	1,135
Dulhasti	Jammu & Kashmir	390	2007	1,907
Teesta V	Sikkim	510	2008	2,573
Total		**3,655**		**16,467**
NHDC				
Indira Sagar	Madhya Pradesh	1,000	2005	2,698
Omkareshwar	Madhya Pradesh	520	2007	1,166
Total		**1,520**		**3,864**
Grand total		**5,175**		**20,331**

Source: NHPC RHP, B&K Research

Annexure II – Upcoming projects

Power station	Installed capacity (MW)	Estimated design energy (MU's)	Project cost (Rs mn)	Revised costs (CEA estimates)	NHPC RHP	B&K estimate
Sewa II	120	534	6,655	8,970	December 2009	February 2010
Teesta Low Dam Stage III	132	594	7,689	12,794	February 2011	May 2011
Uri II	240	1,123	17,248	17,250	February 2011	May 2011
Chamera III	231	1,108	14,056	15,840	August 2010	December 2010
Teesta Low Dam Stage IV	160	720	10,614	10,610	August 2011	November 2011
Nimoo Bazgo	45	239	6,110	7,960	August 2010	December 2010
Parbati III	520	1,963	23,046	22,170	November 2010	June 2011
Parbati Stage II	800	3,108	39,196	39,540	March 2013	June 2013
Chutak	44	212	6,213	8,020	February 2011	May 2011
Subansiri Lower	2,000	7,422	62,853	74,520	December 2012	750 MW – June 2012, 1,250 MW – March 2012
Kishenganga	330	304	36,420	36,420	January 2016	January 2016
Total	**4,622**	**17,326**	**230,100**	**254,094**		

Source: NHPC RHP, CEA, B&K Research

Annexure III – Projects awaiting clearances

Power station	Proposed capacity (MW)	State	Budget for FY10 (Rs mn)	Comments
Kotli Bhel Stage IA	195	Uttarakhand	700	Forest Clearance from MoEF/CCEA clearance
Kotli Bhel Stage IB	320	Uttarakhand	600	Forest Clearance from MoEF/CCEA clearance
Kotli Bhel Stage II	530	Uttarakhand	1,400	Forest Clearance from MoEF/CCEA clearance
Dibang	3,000	Arunachal Pradesh	500	Public Hearing
Teesta IV	520	Sikkim	90	DPR submitted for approval
Total	**4,565**		**3,290**	

Source: NHPC RHP, B&K Research

Annexure IV – New tariff norms

Annual Fixed Charges (AFC) split equally between capacity and energy charge

The new CERC norms for hydro projects mandates stricter efficiency by making the last few year's average plant availability as the normative availability factor i.e. the threshold for earning 15.5 % RoE, beyond which incentives are applicable. Under the new regulations, **the recovery of the Annual Fixed Charges (AFC) would be split equally between capacity charge and energy charge.**

Capacity charge

Capacity charge is a function of the PAFM over NAPAF. If the PAFM exceeds the NAPAF it earns incentives under capacity charge (on pro rata basis).

Capacity charge = AFC x 0.5 x NDM / NDY x (PAFM / NAPAF) Where,

AFC is the Annual Fixed Charge

NAPAF is the Normative Plant Availability Factor in percentage which is linked to the average water flow at the generating station over the last few years as per CERC's discretion.

PAFM is the Plant Availability Factor during the month which is based on installed capacity, declared capacity, normative auxiliary energy consumption and number of days in a month.

Efficiency in the PAFM would translate into a direct increase in the capacity charge realised.

Energy charge

Incentive on Energy Charge Rate (ECR) limited to 80 paise/kWh

Energy Charge Rate (ECR) is based on the historical average of the design energy (DE) over the last few years as per CERC's discretion. Energy Charge to be paid by the beneficiary to the generating station is:

(Energy charge rate in Rs/kWh) x {Schedule energy (ex-bus) for the month in kWh} x (100-FEHS)/100

Energy Charge Rate (ECR) = AFC x 0.5 x 10 / {DE x (100 – AUX) x (100 – FEHS)

Where,

Design Energy (DE) is the normative units generating capacity of a hydro-electric power plant, given the installed capacity based on average rainfall & water flow.

FEHS is free energy for home state in per cent.

If the actual units generated are above the design energy, incentives can be earned over and above the ECR. The ECR payable as incentive is limited to 80 paise/kWh.

- **In case total energy generated is less than the Design Energy**

  i) Within 10 years of commercial operation:

  ECR for the year following the year of energy shortfall = ECR formula as above but the DE will be replaced by the actual energy generated during the year of the shortfall.

  ii) After 10 years of commercial operation:

  For the third financial year, the formula for ECR will have DE replaced by (A1 + A2 – DE) Where,

  A1 = energy generated in the year of shortfall,

  A2 = energy generated in the year following the shortfall

  DE = Design Energy.

- **Actual Energy greater than Design Energy**

  In case ECR calculated for a generating station exceeds 80 paise/ kWh, and the actual saleable energy in a year exceeds {DE x (100 – AUX) x (100 – FEHS) / 10000} MWh the Energy charge for the energy in excess of the above shall be billed at 80 paise/kWh only.

  In a year following energy shortfall, the energy charge rate shall be reduced to below 80 paise / kWh after the energy charge shortfall of previous year has been made up.

Note:

- Since **there is 50% weightage** to Energy Charge & Capacity Charge, the plant stands to earn under one or both. **Conversely a lower than threshold achievement would mean a lower than mandated recovery under each of the above.**
- Further, under the new norms the **onus is on actual generation of a hydro-electric power plant** where **as under the older norms a plant could recover the entire capacity charge if it was available for generation**. The availability of water or insufficient water flow did not matter. Hence, under the new norms, **a hydro electric power plant is adversely affected if the water flow is insufficient as the recovery of capacity and energy charge** is directly related to the actual operation of a plant.

Income Statement

Yr end 31 Mar (Rs mn)	FY08	FY09	FY10E	FY11E
Net sales	**24,757**	**29,231**	**45,546**	**41,140**
Growth (%)	*26.1*	*18.1*	*55.8*	*(9.7)*
Operating expenses	5,851	10,060	9,776	10,411
Operating profit	18,907	19,171	35,770	30,729
EBITDA	**18,907**	**19,171**	**35,770**	**30,729**
Growth (%)	*24.8*	*1.4*	*86.6*	*(14.1)*
Depreciation	(4,444)	(5,175)	(10,383)	(10,912)
Other income	1,430	3,179	3,768	4,018
EBIT	**15,892**	**17,175**	**29,155**	**23,835**
Interest paid	(4,534)	(5,052)	(5,730)	(5,894)
Pre-tax profit	11,358	12,123	23,425	17,941
(before non-recurring items)				
Tax (current + deferred)	(1,215)	(1,157)	(2,694)	(2,825)
Net profit	**10,143**	**10,965**	**20,732**	**15,116**
Non-recurring items	461	3,046	(6,109)	0
Adjusted net profit	**10,604**	**14,012**	**14,623**	**15,116**
Growth (%)	*14.9*	*32.1*	*4.4*	*3.4*

Balance Sheet

Yr end 31 Mar (Rs mn)	FY08	FY09	FY10E	FY11E
Current assets	33,425	39,909	92,673	98,679
Investments	30,492	27,936	25,396	22,856
Net fixed assets	246,071	280,360	310,876	343,686
Total assets	**309,989**	**348,205**	**428,945**	**465,221**
Current liabilities	26,236	33,852	33,852	33,852
Total Debt	99,563	122,340	147,094	173,425
Other non-current liabilities	13,033	13,295	13,295	13,295
Total liabilities	**138,832**	**169,487**	**194,240**	**220,571**
Share capital	111,825	111,825	152,082	152,082
Reserves & surplus	59,335	66,917	82,646	92,591
Less: Misc. expenditure	(3)	(23)	(23)	(23)
Shareholders' funds	**171,157**	**178,718**	**234,705**	**244,650**
Total equity & liabilities	**309,989**	**348,205**	**428,945**	**465,221**

Cash Flow Statement

Yr end 31 Mar (Rs mn)	FY08	FY09	FY10E	FY11E
Pre-tax profit	11,819	15,169	23,425	17,941
Depreciation	4,458	5,183	10,383	10,912
Chg in working capital	4,186	2,175	(1,692)	418
Total tax paid	(1,624)	(1,060)	(2,694)	(2,825)
Other operating activities	4,179	6,196	1,962	1,876
Cash flow from oper. (a)	**23,019**	**27,663**	**31,385**	**28,322**
Capital expenditure	(26,636)	(31,570)	(40,900)	(43,721)
Chg in investments	2,735	2,556	2,540	2,540
Other investing activities	1,433	541	3,768	4,018
Cash flow from inv. (b)	**(22,468)**	**(28,474)**	**(34,592)**	**(37,164)**
Free cash flow (a+b)	**551**	**(810)**	**(3,207)**	**(8,841)**
Equity raised/(repaid)	0	0	40,257	0
Debt raised/(repaid)	22,263	15,604	24,753	26,331
Dividend (incl. tax)	(3,580)	(3,717)	(5,002)	(5,171)
Other financing activities	(5,490)	(7,777)	(5,730)	(5,894)
Cash flow from fin. (c)	**13,193**	**4,111**	**54,279**	**15,266**
Net chg in cash (a+b+c)	**13,744**	**3,300**	**51,072**	**6,425**

Key Ratios

Yr end 31 Mar (%)	FY08	FY09	FY10E	FY11E
Adj EPS post extraordinary(Rs)	0.9	1.3	1.2	1.2
Adj EPS growth	15.0	32.1	(5.1)	3.4
EBITDA margin	76.4	65.6	78.5	74.7
EBIT margin	64.2	58.8	64.0	57.9
RoCE	5.9	5.7	7.6	5.7
RoE	6.2	7.8	6.2	6.2
Debt/Equity	58.2	68.5	62.7	70.9

Valuations

Yr end 31 Mar (x)	FY08	FY09	FY10E	FY11E
PER	33.9	25.7	27.0	26.2
PCE	24.6	22.3	12.7	15.2
Price/Book	2.1	2.0	1.7	1.6
Yield (%)	0.8	0.9	1.1	1.1
EV/Net sales	19.3	17.1	10.4	12.0
EV/EBITDA	23.4	22.3	12.0	14.2

Du Pont Analysis – ROE

Yr end 31 Mar (x)	FY08	FY09	FY10E	FY11E
Net margin (%)	42.8	47.9	32.1	36.7
Asset turnover	0.1	0.1	0.1	0.1
Leverage factor	1.7	1.9	1.9	1.9
Return on equity (%)	6.2	7.8	6.2	6.2

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