

SO WHAT? THE BNP PARIBAS ANGLE

INDUSTRY OUTLOOK: ↑

- We highlight why regulated hydropower business is unattractive
- We highlight the difficulties NHPC faces in executing hydro projects
- We compare hydro power across countries

Net Profit 11..INR20,544m

Diff from Consensus.. 14.1%
Consensus (mean) ...INR18,008m
Consensus (momentum) ↔

Target Price INR29.00

Diff from Consensus3.6%
Consensus (median)INR28.00
Consensus (momentum) ↔

Current Price INR33.05
Upside/(Downside)..... (12.3%)

REDUCE

Recs in the Market

Positive na
Neutral na
Negative 3
Consensus (momentum) ↓

Sources: Thomson One Analytics; Bloomberg; BNP Paribas estimates

- We initiate on the stock with REDUCE and a TP of INR29.00 valued at P/BV of 1.4x for FY11, a discount to peers at 2.5x.
- The inherent risks associated with hydropower projects include a long gestation period and execution problems.
- Regulations do not favour hydro projects (unlike thermal) resulting in lower-than-peers' ROE till FY12.

Hydro Ain't Electrifying

Hydropower – a risky business

We Initiate coverage on NHPC Ltd with a REDUCE rating and TP of INR29.00. NHPC is a regulated government-owned hydropower generation utility with 13 existing plants and a capacity of 5.1GW (12% of India's hydropower generation capacity). Hydro power projects have long gestation periods taking several years to plan and build. With potential opposition from environmentalists and people displaced by the project, they also face significant execution risks. Seven of NHPC's 11 projects under implementation have been delayed by a year or more owing to natural calamities, opposition from environmentalists and locals.

Low returns for high risks

NHPC assumes a higher risk in building hydropower plants but the Central Electric Regulatory Commission's (CERC) tariff regulations do not compensate it for the extra risk. Unlike the National Power Thermal Corp (NTPC), NHPC has lower levers to boost its ROE above 15.5%. New regulated tariffs for the period FY10-14 are negative for NHPC as its profits could be hit if it can't generate the stipulated amount of electricity owing to water shortages. We estimate every 10% shortfall in generation will lead to an 11.3% reduction in our FY10 EPS estimates.

High CWIP and low leverage depress ROEs

The long gestation period and high execution risks mean investor returns in NHPC are low. ROE in FY09 was only 9.1% due to low leverage and a low asset-turnover ratio. Presently 32% of its equity is stuck in capital work in progress, which earns no returns – due to the long gestation of projects and execution delays, 8% in 8.5% tax-free bonds and 6% of equity is deployed in cash. We expect the same in FY12, when only 49% of the equity will earn returns.

Unattractive valuations: Initiate with TP of INR29.00/share

Our TP of INR29.00 is based on 1.4x our FY11 BV/share estimate, a discount to NTPC's FY11 P/BV of 2.5x. We believe the valuation discount is warranted for the significantly lower ROE of 8.3% vs NTPC's ROE of 14.6%. We expect upside if more NHPC projects are allowed to sell Carbon Emission Rights under the Clean Development Mechanism.

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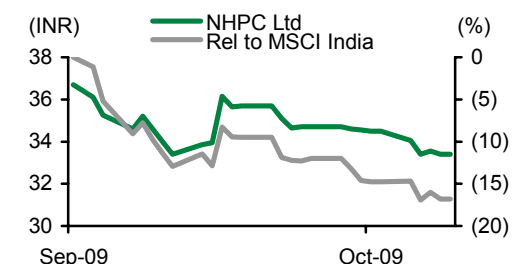
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Earnings Estimates And Valuation Ratios

YE Mar (INR m)	2009	2010E	2011E	2012E
Revenue	36,503	45,851	52,215	61,656
Reported net profit	12,446	20,700	20,544	24,269
Recurring net profit	16,407	17,091	20,544	24,269
Recurring EPS (INR)	1.47	1.44	1.67	1.97
Rec EPS growth (%)	13.7	(1.5)	15.6	18.1
Recurring P/E (x)	22.5	22.9	19.8	16.8
Dividend yield (%)	1.0	1.1	1.3	1.6
EV/EBITDA (x)	17.3	13.9	12.5	10.6
Price/book (x)	2.0	1.7	1.6	1.5
ROE (%)	9.1	8.1	8.3	9.2
Net debt/equity (%)	62.1	39.7	45.6	41.4

Sources: NHPC Ltd; BNP Paribas estimates

Share Price Daily vs MSCI India



Next results/event	October 2009
Market cap (USD m)	8,773
3m avg daily turnover (USD m)	60.1
Free float (%)	14
Major shareholder	Government Of India (86%)
12m high/low (INR)	36.75/33.05
ADR (USD)	Nil
Avg daily turnover (USD m)	Nil
Discount/premium (%)	Nil
Disc/premium vs 52-wk avg (%)	Nil

Sources: Datastream; Bloomberg



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Please see India Research Team list on page 19.

OVERVIEW OF HYDROPOWER

Hydropower – a risky business

Building hydropower plants is more difficult than building thermal power plants. They take longer to build and have significant execution risks.

Understanding hydropower

The pros of hydropower:

Hydropower is a renewable source of electric power. Developing hydropower is crucial for India as it does not require fossil fuels and reduces the nation's need to import them – a key driver of India's current account deficit.

In addition, the cost of generation from a hydro plant reduces as the plant ages (with lower to no depreciation). Hydropower plants have a long life (at least 35 years). Some operational hydro plants are about 100 years old and tariffs are as low as INR0.60/kWh compared to the lowest tariff of INR0.90/kWh for a coal-based plant.

In the absence of any climate change legislation in India, thermal power plants in India do not have to purchase rights to emit greenhouse gases (carbon credits) and therefore the cost of generation of thermal plants appears low. In Europe due to the climate change legislation, thermal plants have to purchase carbon credits. Consequently, hydropower is one of the cheapest sources of power in Europe.

Operationally, hydro projects are capable of quick start and stop and can adjust to rapid changes in demand for electricity. Hydro plants are ideal for meeting any sudden spurt in demand and improve a grid's reliability.

Hydro power is one of the most efficient sources of energy. Hydro plants can convert more than 90% of the energy of water into electricity while the best fossil fuel based plants – the combined cycle cogeneration plants are only 60% efficient. Conventional coal fired plants have an efficiency less than 40%

Hydro power reduces dependency on fossil fuel imports

Hydro power generation costs go down with age.

Hydro power can respond quickly to changes in power demand

Hydro power plants – more efficient than thermal

The cons of hydropower

A hydropower plant takes at least seven years to plan and build compared to a thermal power plant that can be built within a maximum period of 3-4 years.

A hydropower plant harnesses the energy from water falling from a height and uses it to drive a turbine-generator to generate electricity. A **Run of the River (ROR)** plant generates electricity using a turbine that is driven by water from a river falling from a height. These plants do not have a reservoir to store the water. Storage ponds can be constructed to divert the water but are not used to change the course of the river. Storage ponds are used to mitigate short-term variations in water flow.

In contrast, **storage hydro plants** include a reservoir where seasonal surplus water is stored for generation of electricity during the lean seasons. Storage hydro plants also help in controlling water flow and thus aid in flood control and augment water supplies for drinking and irrigation.

Storage hydro plants could change the course of a river. Building a large reservoir involves submergence of vast tracts of land, which may be densely populated or afforested. It might displace a large number of people and affect their livelihoods. Large hydro plants could also make its surrounding areas vulnerable to earthquakes and landslides. Therefore, large storage hydro plants in densely populated/afforested

ROR plants explained

Storage hydro plants explained

Setting up large hydro plants takes decades as they meet tremendous opposition

areas have been extremely controversial – often meeting with tremendous opposition from people and environmental activists, leading to years of litigation and agitations.

In China, the Three Gorges Dam – the largest hydropower project in the world – was conceptualized in the 1950s. Construction finally started in 1994 and it became fully operational in 2009. It displaced about 1.9 m people, and destroyed natural and archaeological wonders.

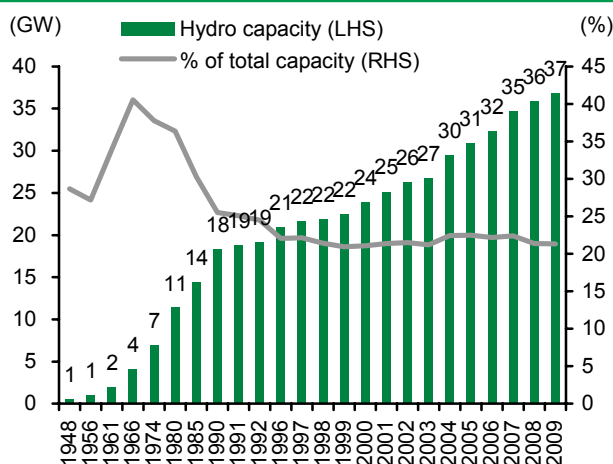
China's Three Gorges project took 15 years to build at a huge cost

In India, the Narmada and Tehri dams evoked huge protests that lasted for many years. Although conceptualized in the 1950s, construction for the Narmada project was started only in 1987 and the initial works were completed in 1994. The Tehri dam, conceptualized in the 1970s, was finally completed in 2006.

Narmada and Tehri dam projects in India were hugely controversial

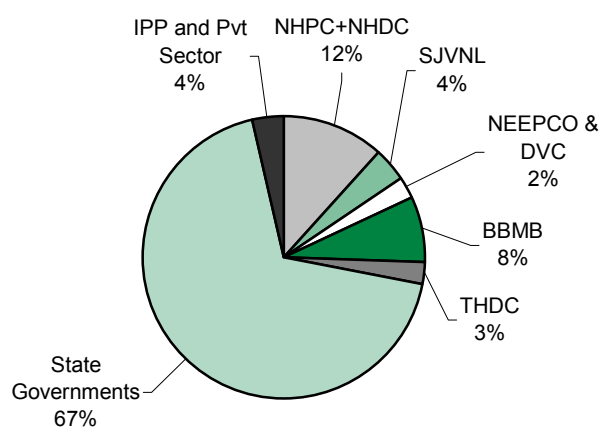
Hydropower in India

Exhibit 1: Hydro Capacity Growth And % Share Of Installed Cap



Sources: CEA; BNP Paribas

Exhibit 2: NHPC's Share In Hydro Capacity



Sources: CEA; BNP Paribas

In FY09, hydropower accounted for 14% of India's power generation. Hydropower capacity accounts for 21% of India's installed power generation capacity of 173 GW.

The growth in thermal power generation capacity has been higher than that of hydropower generation as hydro projects have long gestation periods – can take at least seven years to plan and build. With potential opposition from environmentalists and people displaced by the hydropower project, it also faces significant execution risks. Even during construction, a number of geological surprises could derail a project.

Exhibit 3: Problems Faced By Hydro Projects In India

Project	Location	Capacity (MW)	Companies	Reason for delay/cancellation
Teesta I	Sikkim	280	Himalayan Green Energy Pvt Ltd	Delay because of opposition from locals
Teesta II	Sikkim	330	Him Urja Infra Pvt Ltd	Delay because of opposition from locals
Rangyong	Sikkim	117	BSCPL-SCL JV	Scrapped because of opposition from environmental groups
Lingza	Sikkim	99	Not available	Scrapped because of opposition from environmental groups
Lachen	Sikkim	210	NHPC	Delayed because of opposition from locals
Dibang Valley	Arunachal Pradesh	3,000	NHPC	Delayed because of opposition from environmentalists and locals
Lohari NagPala	Uttaranchal	600	NTPC	Work suspended due to agitation by environmentalists

Sources: CEA; Press articles

Problems with hydro projects are India-specific

Canada generates almost 58% of its power requirement using hydropower plants. Even Europe has a good installed base of hydropower plants. Conditions in these areas have been more conducive for developing hydropower because these areas are sparsely populated (not many people are displaced) and the geological formations are largely stable. India's hydro potential exists in the Himalayas, a region that is covered with forests and also prone to earthquakes, which makes the construction of a hydropower plant even more difficult (besides the usual opposition from displaced people and environmentalists). Moreover, many of the rivers and locations are part of the country's heritage and conservationists vehemently oppose any construction in these places.

NHPC'S GROWTH PLANS

NHPC's plans at risk of delays

Seven out NHPC's 11 projects under implementation have faced execution delays. Our estimates factor in no further delays; so any further delay could negatively affect our earnings estimates.

With an installed capacity of 5.1 GW, NHPC accounts for 12% of India's hydropower generation capacity. NHPC focuses more on ROR projects compared to storage projects as ROR projects are easier to execute as they displace fewer people and cause lesser damage to the environment compared to storage hydro projects. NHPC has 11 projects totalling 4.6 GW of generation capacity under construction. It is awaiting government approval for another 6.7 GW of planned projects while it is surveying and investigating to prepare proposals for nine additional projects totalling 8.6GW of anticipated capacity.

NHPC focuses on ROR projects as these displace a smaller number of people and cause lesser damage to the environment than a storage plant

Exhibit 4: Status Of Projects Under Implementation

Project	State	Capacity (MW)	Design Energy (m kwh)	Original schedule	Latest schedule	Project cost (INR m)	Cost/MW (INR m)
Parbati-II	Himachal Pradesh	800	3,109	2009-10	2012-13	39,545	49
Delayed on account of geological problems including 3 landslides, poor relations amongst the contractors and strikes by labourers.							
Chamera III	Himachal Pradesh	231	1,108	2010-11	2010-11	15,844	69
Project was temporarily delayed due to labour agitations and coffer dam getting washed away in July 2007. In the last week of Sep 2009 a landslide damaged cranes of the contractor (HCC) injuring three workers and causing damage in excess of INR60m.							
Parbati - III	Himachal Pradesh	520	1,963	2010-11	2010-11	22,181	43
Poor geology and delays in award of Engineering and Maintenance works led to temporary delays							
Uri-II	Jammu & Kashmir	240	1,124	2009-10	2010-11	14,920	62
Project is delayed due to earthquake, floods, landslides							
Sewa II	Jammu & Kashmir	120	533	2007-08	2009-10	8,500	71
Project is delayed due to labour agitations and poor geology							
Chutak	Jammu & Kashmir	44	213	2010-11	2011-12	7,804	177
Extreme cold climate. Delay in awarding contract works due to poor participation and high priced bids							
Nimoo Bazgo	Jammu & Kashmir	45	239	2010-11	2010-11	7,809	174
Extreme cold climate and delay in awarding contracts owing to poor participation and high priced bids have caused delays							
Teesta Low Dam - III	West Bengal	132	594	2006-07	2010-11	11,839	90
Delay due to opposition from locals and environmentalists, delay in getting environmental clearances and flash floods							
Teesta Low Dam - IV	West Bengal	160	720	2009-10	2011-12	10,814	68
Delay due to opposition from locals and environmentalists, delay in getting environmental clearances and flash floods							
Subansiri Lower	Assam/Arunachal Pradesh	2,000	7,421	2010-11	2012-13	74,520	37
Delayed by law & problems at site, landslides, floods and opposition from locals. The project is also facing troubles due to border disputes between Arunachal Pradesh and Assam.							
Kishanganga	Jammu & Kashmir	330	1,350	2016-17	2016-17	36,335	110
Government expects NHPC to finish this project as early as possible as India is competing with Pakistan, which is building another hydro project on the same river. As per the Indus Water treaty between India and Pakistan, the project completed first will be considered "valid" as per the treaty.							
Total		4,622				250,109	54.11

Sources: CEA; Press articles; NHPC IPO Prospectus

Seven of NHPC's 11 projects under implementation have been delayed by a year or two owing to natural calamities, opposition from environmentalists and locals.

Exhibit 4 highlights the issues that NHPC is grappling with in construction of its new projects. We believe our earnings estimates are aggressive as we assume no further delays in execution of these projects. Any further delays will negatively affect our earnings estimates.

OVERVIEW OF REGULATION

Regulated returns not enough for higher risks

The current tariff regulations are unfavorable to hydro projects as compared to thermal projects as they do not compensate for the higher risk involved in building hydropower plants. NHPC's FY09 Return on regulated equity of 16.3% is much lower than NTPC's 24.8% as NHPC has fewer levers to raise its ROE above regulated return of 15.5% as compared to NTPC.

Just like other central government owned utilities like NTPC and PowerGrid, NHPC is a regulated utility and the Central Electricity Regulatory Commission (CERC) determines its power tariffs. For the period FY10-14, like NTPC and Power Grid, NHPC will get a regulated ROE of 15.5%, up from 14% earlier.

We believe the tariff regulations for NHPC are not as favourable as those for thermal power projects. As described above, NHPC not only takes a significantly higher risk but also takes a longer time than NTPC in setting up projects and yet both get the same returns of 15.5%.

Moreover, new tariff regulations introduced by the CERC for the period FY10-14 are negative for NHPC. The previous regulations guaranteed a 14% ROE for a hydroelectric project as long as it was available to generate electricity. It did not matter even if it could not actually produce the stipulated quantum of electricity because of a shortage of water. Under the new regulations, the regulated ROE has been increased to 15.5% but only half of it can be recovered based on availability. The plant will recover the other half only if it produces the stipulated quantum of electricity. In case the plant is unable to produce the stipulated quantum due to water shortage, the shortfall will be recovered in subsequent years. Consequently, if there is water shortage in any year – a factor over which the company has no control and is an inherent characteristic of ROR hydro projects – NHPC's ROE for the year will be affected in case there are water shortages. We estimate that every 10% shortfall in generation will reduce our FY10 EPS estimates by 11.3%.

Every 10% shortfall in generation will reduce our FY10 EPS estimates by 11.3%

Compared to NTPC, NHPC has limited levers to boost its plants ROEs above the regulated levels by exceeding regulatory benchmarks for performance. Compared to NHPC's FY09 operating plant ROE of 16.3%, NTPC's operating plant ROE was 24.8% due to savings on fuel costs, which it can retain instead of passing them on to customers, incentives and earnings from unscheduled interchange (UI) charges. NHPC has lower levers to boost operating plant ROEs above regulated ROE Of 15.5%.

ROEs for NHPC's operating plants are 16.3% – much lower than NTPC's 24.8%

Exhibit 5: NHPC vs NTPC – ROE On Regulated Equity

Amount (INR m)	NHPC	NTPC
Recurring PAT	16,407	81,134
Less: Other income (net of tax)	5,169	27,928
Profit from regulated operations	11,238	53,206
Regulated equity	68,786	214,544
ROE (%)	16.3	24.8

Note: NTPC numbers are on Stand alone basis
Sources: NHPC Ltd; NTPC; BNP Paribas estimates

FINANCIAL ANALYSIS

Even in FY12, ROEs will remain sub-par

NHPC's current ROE of 9.1% is below the cost of equity of 12% and is significantly below that of NTPC and Powergrid's. We expect NHPC's ROE to remain in single digits even in FY12 as a significant portion of equity will be stuck in CWIP.

Why does NHPC have low ROEs?

NHPC's recurring FY09 ROE at 9.1% is lowest among its peers due to the following reasons:

- The regulated tariffs for the period FY04-09 did not adequately recover the actual operations & maintenance (O&M) expenses that NHPC incurred. The CERC has corrected this while fixing NHPC's tariffs for the period FY10-14.
- Long gestation periods of projects mean that equity is stuck in capital work in progress for longer time and it does not earn the regulated ROE.
- We estimate that in FY09, 32% of NHPC's equity was stuck in capital work in progress (CWIP), which earned no returns, and about 14% of the equity was in cash or invested in 8.5% tax-free bonds – both earning less than the regulated ROE of 15.5%. Our conversations with management indicate that the equity in CWIP has been high historically as the government used to order NHPC to invest half of the equity investment in a project in the first year itself. In the future, NHPC will invest only 30% of the annual capex on a project, while the rest will be financed by debt. This should reduce the proportion of NHPC's equity deployed in CWIP.

Under-recoveries of O&M expenses, over-capitalization and long gestation periods have lead to low ROEs

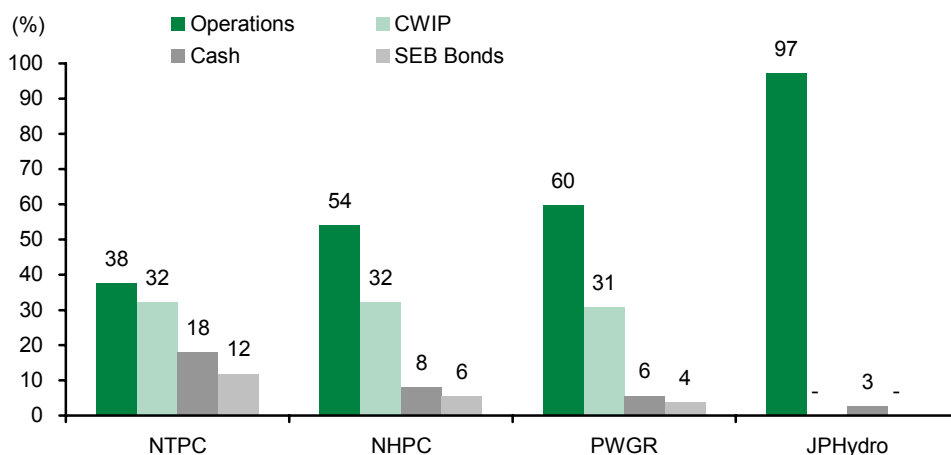
Du Pont Analysis

Exhibit 6: Du Pont Analysis – NHPC vs Peers

Company	Net margin			Asset turnover ratio			ROA			Leverage			ROE		
	FY07	FY08	FY09	FY07	FY08	FY09	FY07	FY08	FY09	FY07	FY08	FY09	FY07	FY08	FY09
	(%)	(%)	(%)	(x)	(x)	(x)	(%)	(%)	(%)	(x)	(x)	(x)	(%)	(%)	(%)
NHPC	48.9	45.8	44.9	0.1	0.1	0.1	4.1	5.2	5.1	1.7	1.6	1.8	6.9	8.4	9.1
Jaiprakash Hydro	43.7	50.8	50.8	0.0	0.2	0.2	0.8	7.8	7.7	2.3	2.0	1.8	1.9	15.8	12.4
NTPC	19.4	20.2	18.0	0.5	0.5	0.5	9.0	9.4	8.8	1.5	1.6	1.7	13.8	14.9	14.5
Power Grid	30.6	34.7	32.0	0.1	0.1	0.1	3.5	4.1	4.0	3.0	3.1	3.1	10.6	12.6	12.4

Sources: NHPC Ltd; NTPC; Jaiprakash Hydro; Power Grid; BNP Paribas estimates

Exhibit 7: Equity Deployment NHPC And Peers – 2009



Sources: NHPC Ltd; NTPC; Jaiprakash Hydro; Power Grid; BNP Paribas

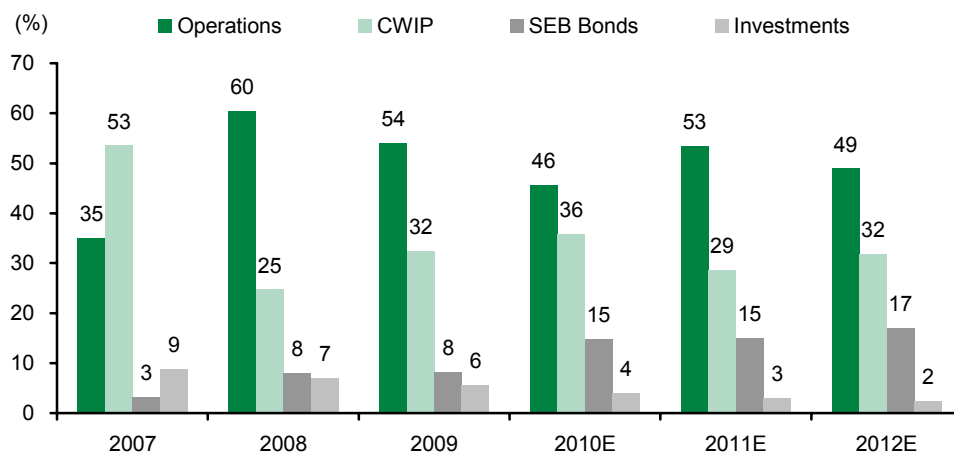
NHPC vs NTPC: NHPC's company level FY09 recurring ROE at 9.1% is significantly lower than that of NTPC's 14.5%. Despite NTPC having lower leverage, its ROE is higher than that of NHPC as NTPC's operating plants earn an ROE of 24.8% compared to the 16.3% earned by NHPC's plants. Further, a Dupont analysis of NHPC and its domestic peers reveals that NHPC's lower returns stem from its low asset turnover ratio as well as low leverage.

NHPC vs Power Grid: Despite NHPC earning a higher ROA than Power Grid, it earns a lower ROE due to its low levels of leverage.

ROEs to remain sub-par until FY12

We expect NHPC's ROE to contract by 100bp in FY10 to 8.1% from 9.1% in FY09 despite an increase in regulated ROE from 14% to 15.5% as the company's equity base has increased in FY10 due to its recent IPO and this equity is not immediately deployed in operations. We estimate that 54% of NHPC's equity will be stuck in CWIP, cash and bonds in FY10 compared to 46% in FY09. We expect the ROEs to improve beginning FY11 as new projects are commissioned. However, NHPC's ROE will be in single digit even in FY12 as 51% of its equity will still be in CWIP, cash and bonds.

Exhibit 8: NHPC Equity Deployment – FY07-12E



Even in FY12, only 49% of equity will earn regulated returns.

Sources: NHPC Ltd; BNP Paribas estimates

Exhibit 9: NHPC's ROE Profile



Expect NHPC's ROE to decline in FY10 as IPO proceeds invested in upcoming projects will not generate returns

Sources: NHPC Ltd; BNP Paribas estimates

VALUATION

Unattractive valuations – TP of INR29.00/share

We value the shares of NHPC at 1.4x FY11 book; a discount to peer median of 2.5x due to its lower ROE of 8.3% compared to that of peers at 12.2%. Our estimates assume full recovery of the 15.5% ROE beginning FY10 and factor in the benefits accruing to NHPC from sale of CERs.

Our TP implies a downside of 12.3% from current levels

We value NHPC's business using FY11 P/BV multiple of 1.4x. Our target multiple for NHPC is at a discount to median FY11 P/BV of 2.5x. We believe that a lower multiple is justified for NHPC as its FY11 ROE is lower at 8.3% vs peer median of 12.2%. Our target multiple applied on NHPC's FY11 book value of INR20.77/share implies a target price of INR29.00/share, a 12.3% downside from current levels. NHPC's shares currently trade at an FY11 P/BV of 1.6x.

We project an EPS CAGR of 10.3% between FY09 and FY12, driven by capacity expansion from 5.1 GW in FY09 to 6.6 GW by FY12. However, the ROE will improve only slightly from 9.1% in FY09 to 9.2% in FY12, as the company will still deploy only 49% of its equity in its operations in FY12 compared to 54% in FY09. The remaining 51% equity will be stuck in capital work in progress that will earn no returns, in SEB bonds that generate 8.5% post tax return, and cash that we estimate earns less than regulated returns.

ROE in FY12 would still be 9.2% only, as 51% of equity will generate below par returns

Our estimates factor in smooth and timely execution of all projects under construction. We are also factoring in 15.5% post tax regulated ROE. We assume that NHPC's power plants will exceed the stipulated availability norms and will generate more than the stipulated amount of electricity. We estimate incentives for surpassing targets on availability and generation to remain at the same levels. In addition, we have assumed that the company will be able to earn additional incentives in the future in line with its FY09 reported earnings.

We assume full recovery of 15.5% ROE in our estimates

NHPC's earnings are very seasonal. 70% of power generation occurs in the first half of the fiscal year i.e. during the monsoons.

Earnings are very seasonal

The 390 MW Dulhasti project, which was conceived in 1983, was finally completed in March 2008. The planned capex in 1989 was INR12.6b but the project was finally completed at a cost of INR50.6b. The CERC had fixed a provisional tariff of INR 3/unit while it was determining what capital cost it should admit for computation of the tariff in light of the substantial cost over-runs in the project. We expect that the CERC will fix a final tariff of INR4.2/kwh for FY08 and FY09, assuming a capital cost of INR 50.6b. Based on this we estimate, NHPC will be allowed to recover a revenue shortfall of INR4.3b on the Dulhasti project. We have included the same in our FY10 earnings as non-recurring income. For the period FY10-14, we estimate Dulhasti's tariffs at INR4.7/kwh.

Expect a one-time income of INR 4.3 b in FY10 for compensation of under-recoveries for the Dulhasti project

We have also included benefits from sale of Certified Emission Rights (CERs) from FY11 onward once the Chutak and Nimoo Bazgo projects come online. We have assumed a CER sale price of EUR11/tonne, in line with latest CER futures prices.

Exhibit 10: Relative Valuation

Company	BBG code	Share price (LC)	Market cap (USD m)	P/E			P/BV			ROE		
				FY10E (x)	FY11E (x)	FY12E (x)	FY10E (x)	FY11E (x)	FY12E (x)	FY10E (%)	FY11E (%)	FY12E (%)
NHPC^	NHPC IN	33.05	8,773	22.9	19.8	16.8	1.7	1.6	1.5	8.1	8.3	9.2
NTPC^	NATP IN	209.95	37,203	19.6	18.1	16.8	2.8	2.5	2.3	14.7	14.6	14.3
PWGR ^	PWGR IN	107.85	9,755	21.8	18.8	15.2	2.8	2.6	2.3	13.6	14.3	15.8
China Yangtze Power Co	600900 CH	13.73	18,933	24.7	19.4	19.2	2.4	2.5	2.3	10.2	12.0	11.9
Canada Hydro Developers	KHD CN	5.22	713	76.8	24.6	20.1	1.5	1.4	1.3	2.3	6.7	7.5
Brookfield Renewable Power Fund	BRC CN	18.84	1,875	18.0	15.5	17.3	1.4	1.7	1.8	10.5	12.2	10.4
Median				21.8	18.8	17.3	2.4	2.5	2.3	10.5	12.2	11.9

* Year ending March for India. For China and North America estimates are for immediate previous year ending December

Sources: NHPC Ltd; Bloomberg; ^BNP Paribas estimates

APPENDIX 1**Devil's advocate: Risks to our investment case****Upside from sale of carbon credits**

NHPC has currently received approvals for the sale of 0.35m CERs annually from its Chutak (44MW) and Nimoo Bazgo (45MW) projects. Our estimates factor in the benefits from sale of CERs from these two projects. However the EPS contribution of CERs from the above two projects is less than 1%.

NHPC should incorporate the claim for Carbon credits during the planning stage of a hydro project (i.e. while preparing the Detailed Project Report (DPR)). NHPC was unable to do it for its projects under construction as the CDM mechanism was introduced after many of these projects were planned. Hence NHPC has managed to secure approval for its smaller hydro plants viz. Chutak and Nimoo Bazgo projects. For all of its planned projects, NHPC is including carbon credits in the DPRs. There would be upside to our earnings in case NHPC manages to get CDM approval for its projects under construction.

Upside from favourable policy changes

CERC has put in rules for setting tariffs for sale of power from NHPC's power plants for the period FY10-14. It is highly unlikely that CERC will make any changes. But the Government could announce changes to policy to promote hydropower.

We do not expect NHPC to have any exposure to the lucrative merchant space as the government's New Hydro Policy 2008 will allow sale of 40% of a project's power generation in the merchant market provided that the project was based on competitive bidding and that the project was completed on time. None of NHPC's planned projects have been won on competitive bidding. However, any favorable amendments to this policy can provide upside.

APPENDIX 2

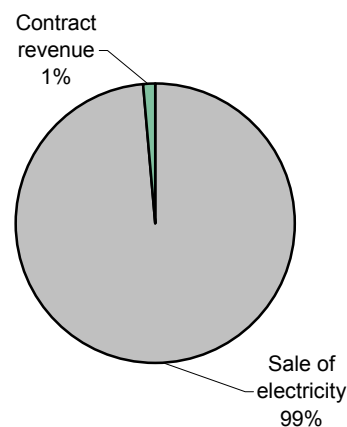
Key company information

Exhibit 2.1: Industry Data

Industry structure :	Oligopoly
Customers :	State Distribution Utilities
Competitors:	NTPC, Reliance Power, Tata Power
Suppliers :	BHEL, Alstom, Siemens, States hosting the project, HCC, Patel Engineering
Markets :	Domestic
Regulation :	High

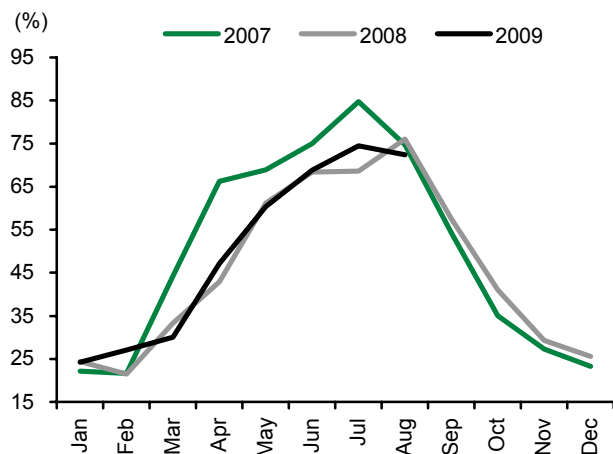
Source: BNP Paribas

Exhibit 2.2: Revenue Breakdown – FY09



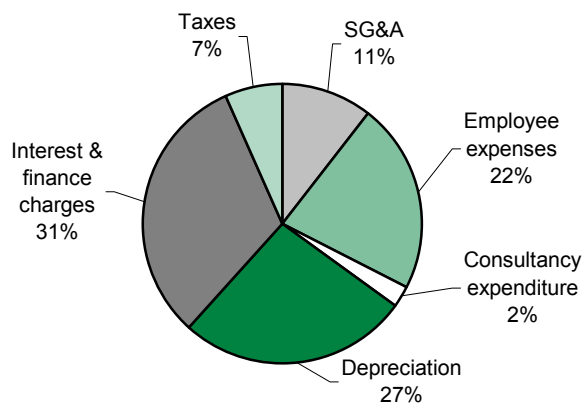
Sources: NHPC Ltd; BNP Paribas

Exhibit 2.3: Monthly PLFs



Sources: NHPC Ltd; BNP Paribas Estimates

Exhibit 2.4: Cost Breakdown – FY09



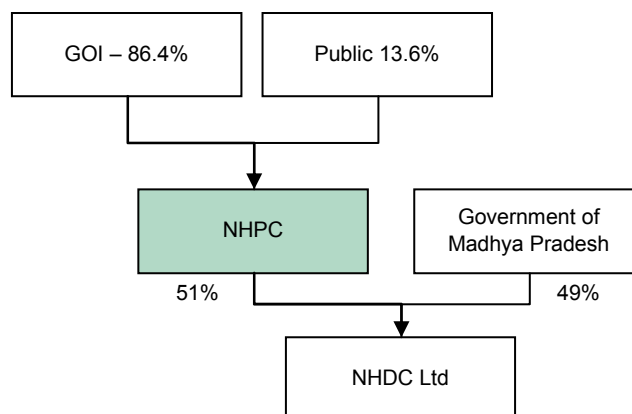
Sources: NHPC Ltd; BNP Paribas

Exhibit 2.5: Company Background

NHPC is a regulated government owned hydropower generation utility with 13 existing plants with a capacity of 5.1 GW (12% of India's hydropower generation capacity). NHPC is building another 11 hydropower projects with a capacity of 4.6 GW. It is also evaluating the feasibility of building another 15GW of hydropower plants.

Source: NHPC Ltd

Exhibit 2.6: Holding Structure



Source: NHPC Ltd

Exhibit 2.7: Existing Projects

Project	State	Type	Ownership	Capacity	FY09 generation	FY09 utilization	FY09 tariff	Design energy	NAPAF
			(%)	(MW)	(m kWh)	(%)	(INR/kWh)	(m kwh)	(%)
Baira Siul	Himachal Pradesh	ROR	100	180	673	42.7	0.66	779	85
Loktak*	Manipur	Storage	100	90	498	63.2	1.13	448	85
Salal	Jammu & Kashmir	ROR	100	690	3,009	49.8	0.56	3,082	60
Tanakpur*	Uttarakhand	ROR	100	94	428	51.9	1.01	452	55
Chamera	Himachal Pradesh	ROR+pondage	100	540	2,142	45.3	1.14	1,665	90
Uri I	Jammu & Kashmir	ROR	100	480	3,032	72.1	1.19	2,587	60
Rangit	Sikkim	ROR+pondage	100	60	333	63.4	1.39	339	85
Chamera	Himachal Pradesh	ROR+pondage	100	300	1,372	52.2	2.19	1,500	85
Dhauliganga	Uttarakhand	ROR+pondage	100	280	1,117	45.5	1.55	1,135	85
Dulhasti	Jammu & Kashmir	ROR+pondage	100	390	2,199	64.4	3.00	1,907	90
Teesta V	Sikkim	ROR+pondage	100	510	1,887	42.2	1.62	2,573	85
Indira Sagar	Madhya Pradesh	Storage	51	1,000	1,569	17.9	2.40	5,063	85
Omkareshwar	Madhya Pradesh	Storage	51	520	800	17.6	2.21	1,166	90
Total				5,134	19,059	42.4		22,696	

* Capacity De-rated

Sources: NHPC Ltd; CEA; BNP Paribas estimates

Exhibit 2.8: Capacity Addition Schedule

Project	State	FY10E	FY11E	FY12E	FY13E	FY14E	FY15E	FY16E	Capacity (MW)
Parbati-II	Himachal Pradesh	—	—	—	800	—	—	—	800
Chamera III	Himachal Pradesh	—	231	—	—	—	—	—	231
Parbati – III	Himachal Pradesh	—	520	—	—	—	—	—	520
Uri-II	Jammu & Kashmir	—	240	—	—	—	—	—	240
Sewa II	Jammu & Kashmir	120	—	—	—	—	—	—	120
Chutak	Jammu & Kashmir	—	44	—	—	—	—	—	44
Nimoo Bazgo	Jammu & Kashmir	—	45	—	—	—	—	—	45
Teesta Low Dam - III	West Bengal	—	132	—	—	—	—	—	132
Teesta Low Dam - IV	West Bengal	—	—	160	—	—	—	—	160
Subansri Lower	Assam/Arunachal Pradesh	—	—	—	2,000	—	—	—	2,000
Kishanganga	Jammu & Kashmir	—	—	—	—	—	—	330	330
Total		120	1,212	160	2,800	—	—	330	4,622

Sources: NHPC Ltd; CEA; BNP Paribas estimates

APPENDIX 3

Understanding regulated tariffs

Typically, regulated tariffs for thermal power plants consist of three parts

- 1) a fixed charge for recovery of capital costs and regulated return;
- 2) a variable charge to recover fuel costs;
- 3) incentives for surpassing prescribed levels of performance;

In case of a hydropower plant, since there are no fuel costs, only capital costs, regulated returns and incentives are recovered.

For a hydropower plant, the capital costs, regulated returns and incentives (if any) are recovered through an Annual Fixed Charge. (AFC)

The AFC is notionally divided into two parts:

- 1) **Capacity Charge** – A hydro plant recovers half of the AFC as capacity charge as long as the plant is available for the prescribed duration in a year regardless of whether the plant actually generates power or not. The plant earns an incentive for exceeding the prescribed availability. The recovery of capacity charge is delayed if the plant falls short of achieving the prescribed availability. Eg, as per regulations, if the plant has to be available 85% of the time during the year, and if it is actually available for 90%, the plant has surpassed the norm by 5.88%. Therefore, it recovers the prescribed capacity charge and an additional 5.88% of the capacity charge. In case the plant is available only 80% of the time, it has underachieved by 6%, and its recovery will be only 94% of the prescribed capacity charge. The under-recovery of 6% will be recovered through higher tariffs the following year provided that the plant is available for 85% in the following year.
- 2) **An Energy Charge** – Half of the AFC is recovered through an energy charge. The energy charge is equal to half of AFC divided by the design energy. The **design energy** is the amount of electricity in kWh that can be generated using water flow, which is 90% probable (minimum water flow achieved in nine out of the last 10 years). The design energy is specified by CERC for each individual project and is calculated taking into account all the project specific issues. The plant gets an incentive if its generation exceeds the design energy. It is penalized if its generation falls short of the design energy. For example, a plant's design energy is 100m kWh and the energy charge is INR1/kWh leading to a recovery of INR100m. Suppose the plant generates 110m kWh, it gets an incentive for the extra 10m units it generates subject to a cap of INR0.80/kWh ie the lower of the energy charge of INR1/kWh and INR0.80/kWh. Thus the total energy charge actually earned is INR108m. If the generation is only 90m kWh, then the plant only gets INR90m instead of INR100m. The shortfall of INR10m is recovered through a higher energy charge in the following year provided that the generation in the following year is equal to the design energy.

Important riders

- In case of shortfall of energy generation after 10 years from Commercial Operation Date, the design energy used in tariff computation for the subsequent year will be equal to: generation in shortfall year + generation in the subsequent year – DE.
- If generation in a year subsequent to the shortfall year exceeds the design energy, the energy charges for the excess generation cannot exceed INR0.80/kWh after the previous years' under recovery is recouped.
- In all the above tariff calculations, design energy and energy generation are taken net of the auxiliary consumption as well as free home state energy.

CERC announced New Hydro Power Tariff Regulations from FY10–FY14, in January 2009

The components of AFC

- 1) Return on equity (ROE) of 15.5%; 16% if the project is completed on or ahead of schedule. The stipulated Debt/Equity ratio is 70:30. If equity is more than 30%, the excess equity over 30% is treated as a loan and will get only the interest cost, which obviously will be lesser than the regulated ROE. If equity deployed is less than 30%, then only the actual equity deployed will earn the regulated ROE of 15.5%.
- 2) Interest on borrowings: Interest on loans is allowed to be recovered by the generator at actual. In case of any refinancing, the benefits are shared between the generator and the beneficiary in the ratio 1:2.
- 3) Interest on working capital: Interest cost is recovered on normative working capital that is calculated as receivables at two months of fixed costs, 15% of the O&M expenses as maintenance spares and one month of O&M expenses.
- 4) O&M expenses: For existing plants, O&M expenses will be based on actual expenditure for FY04-09, normalised for pay revision and escalated at 5.72% beginning FY10. For plants starting after 1 April 2009, the O&M expenditure will be 2% of project cost, excluding the cost of Rehabilitation and Resettlement (and escalated at 5.72% pa thereafter).
- 5) Depreciation: CERC assumes the lifespan of a hydro project to be 35 years with a salvage value of 10%. Land that is not leased is not a depreciable asset. 1.5% of initial project cost is capitalised as initial spares. For the first 12 years, depreciation is calculated using the Straight line Method and the effective rate is estimated at 4.5-5.0%. After 12 years, the unrecovered capital cost is spread over the useful life of the project. Any additional depreciation claimed under the earlier tariff regulations including an advance against depreciation will be deducted from the capital cost while determining tariffs.

Sharing of proceeds from certified emission rights

Hydropower projects, if they get approval under the Clean Development Mechanism (CDM), are eligible to earn certified emission rights (CERs) credits. A CER credit is the right to emit one ton of carbon-di-oxide. A hydro plant can sell its CER credits to developed countries that have to meet their greenhouse gas emission reduction targets under the terms of the Kyoto Protocol.

As per CERC regulations, NHPC has to share the proceeds from CERs with customers. In the first year of operations of the power plant, NHPC can retain all the proceeds from sale of CERs. Next year, NHPC has to share 10% of the proceeds with customers. The share goes up by 10% every subsequent year until the fifth year and beyond when NHPC has to share 50% of the proceeds with its customers.

FINANCIAL STATEMENTS

NHPC Ltd

Profit and Loss (INR m)					
Year Ending Mar	2008A	2009A	2010E	2011E	2012E
Revenue	31,526	36,503	45,851	52,215	61,656
Cost of sales ex depreciation	(3,074)	(5,049)	(5,977)	(6,103)	(6,232)
Gross profit ex depreciation	28,452	31,454	39,873	46,112	55,423
Other operating income	0	0	0	0	0
Operating costs	(2,326)	(2,594)	(2,845)	(3,250)	(3,675)
Operating EBITDA	26,127	28,860	37,029	42,862	51,748
Depreciation	(5,607)	(6,563)	(10,893)	(12,345)	(14,757)
Goodwill amortisation	0	0	0	0	0
Operating EBIT	20,519	22,297	26,135	30,517	36,991
Net financing costs	(2,469)	(2,182)	(3,277)	(3,502)	(5,447)
Associates	0	0	0	0	0
Recurring non operating income	0	0	0	0	0
Non recurring items	(2,656)	(4,448)	4,297	0	0
Profit before tax	15,394	15,667	27,155	27,016	31,545
Tax	(1,737)	(1,714)	(4,350)	(4,366)	(5,169)
Profit after tax	13,657	13,953	22,806	22,650	26,376
Minority interests	(1,580)	(1,507)	(2,106)	(2,106)	(2,106)
Preferred dividends	0	0	0	0	0
Other items	0	0	0	0	0
Reported net profit	12,077	12,446	20,700	20,544	24,269
Non recurring items & goodwill (net)	2,356	3,961	(3,609)	0	0
Recurring net profit	14,434	16,407	17,091	20,544	24,269

Per share (INR)

Recurring EPS *	1.29	1.47	1.44	1.67	1.97
Reported EPS	1.08	1.11	1.75	1.67	1.97
DPS	0.33	0.34	0.37	0.44	0.52

Growth

Revenue (%)	38.9	15.8	25.6	13.9	18.1
Operating EBITDA (%)	40.8	10.5	28.3	15.8	20.7
Operating EBIT (%)	38.0	8.7	17.2	16.8	21.2
Recurring EPS (%)	26.0	13.7	(1.5)	15.6	18.1
Reported EPS (%)	8.2	3.0	57.2	(4.6)	18.1

Operating performance

Gross margin inc depreciation (%)	72.5	68.2	63.2	64.7	66.0
Operating EBITDA margin (%)	82.9	79.1	80.8	82.1	83.9
Operating EBIT margin (%)	65.1	61.1	57.0	58.4	60.0
Net margin (%)	45.8	44.9	37.3	39.3	39.4
Effective tax rate (%)	11.3	10.9	16.0	16.2	16.4
Dividend payout on recurring profit (%)	25.5	23.1	25.6	26.3	26.4
Interest cover (x)	8.3	10.2	8.0	8.7	6.8
Inventory days	51.5	29.3	25.3	24.8	24.3
Debtor days	103.0	82.5	80.0	80.0	75.0
Creditor days	0.0	0.0	0.0	0.0	0.0
Operating ROIC (%)	6.3	6.3	6.3	6.6	7.4
Operating ROIC – WACC (%)	-	-	-	-	-
ROIC (%)	5.9	6.0	6.0	6.3	7.2
ROIC – WACC (%)	-	-	-	-	-
ROE (%)	8.4	9.1	8.1	8.3	9.2
ROA (%)	5.2	5.1	4.9	5.1	5.6

* Pre exceptional, pre-goodwill and fully diluted

Revenue By Division (INR m)	2008A	2009A	2010E	2011E	2012E
Sale of Power	31,136	36,014	45,337	51,676	61,089
Consultancy	391	489	514	539	566

Sources: NHPC Ltd; BNP Paribas estimates

Project 25.6% revenue growth in FY10 on implementation of new tariff norms

Include INR4.3b of tariff under recoveries for the Dulhasti project in our FY10 estimates as non recurring income

Project 3-year EPS CAGR of 10.3% between FY09 and FY12

Projecting a decline in ROE in FY10 on equity Issuance

Cash Flow (INR m)					
Year Ending Mar	2008A	2009A	2010E	2011E	2012E
Recurring net profit	14,434	16,407	17,091	20,544	24,269
Depreciation	5,607	6,563	10,893	12,345	14,757
Associates & minorities	1,580	1,507	2,106	2,106	2,106
Other non-cash items	29	54	0	0	0
Recurring cash flow	21,650	24,531	30,091	34,995	41,133
Change in working capital	6,367	2,909	(8,045)	4,627	(5)
Capex - maintenance	0	0	0	0	0
Capex – new investment	(30,288)	(32,532)	(41,900)	(58,702)	(32,460)
Free cash flow to equity	(2,271)	(5,092)	(19,855)	(19,080)	8,668
Net acquisitions & disposals	0	0	0	0	0
Dividends paid	(4,030)	(4,369)	(5,183)	(6,044)	(7,028)
Non recurring cash flows	2,735	2,556	6,964	2,267	1,927
Net cash flow	(3,566)	(6,905)	(18,074)	(22,857)	3,566
Equity finance	712	114	40,257	0	0
Debt finance	21,856	13,521	9,790	30,511	9,325
Movement in cash	19,002	6,729	31,973	7,654	12,892

Project INR133b capex between FY09 and FY12

Per share (INR)

Recurring cash flow per share	1.94	2.19	2.54	2.84	3.34
FCF to equity per share	(0.20)	(0.46)	(1.68)	(1.55)	0.70

Balance Sheet (INR m)

Year Ending Mar	2008A	2009A	2010E	2011E	2012E
Working capital assets	21,180	26,213	35,322	36,172	41,922
Working capital liabilities	(30,528)	(37,406)	(38,470)	(43,947)	(49,693)
Net working capital	(9,347)	(11,193)	(3,148)	(7,775)	(7,770)
Tangible fixed assets	307,885	341,348	372,355	418,713	436,415
Operating invested capital	298,538	330,155	369,207	410,937	428,645
Goodwill	0	0	0	0	0
Other intangible assets	3	23	23	23	23
Investments	20,468	17,912	15,245	12,978	11,051
Other assets	0	0	0	0	0
Invested capital	319,009	348,090	384,475	423,939	439,720
Cash & equivalents	(23,459)	(26,061)	(57,345)	(64,999)	(77,891)
Short term debt	0	0	0	0	0
Long term debt *	128,555	149,310	159,099	189,611	198,936
Net debt	105,096	123,249	101,754	124,611	121,045
Deferred tax	0	0	0	0	0
Other liabilities	24,967	26,226	26,226	26,226	26,226
Total equity	175,302	183,949	240,354	255,485	273,358
Minority interests	13,645	14,667	16,142	17,616	19,090
Invested capital	319,009	348,090	384,475	423,939	439,720

* includes convertibles and preferred stock which is being treated as debt

Per share (INR)

Book value per share	15.68	16.45	19.54	20.77	22.22
Tangible book value per share	15.68	16.45	19.54	20.77	22.22

Financial strength

Net debt/equity (%)	55.6	62.1	39.7	45.6	41.4
Net debt/total assets (%)	28.2	29.9	21.2	23.4	21.3
Current ratio (x)	1.5	1.4	2.4	2.3	2.4
CF interest cover (x)	12.3	13.6	7.7	12.3	8.6

Valuation	2008A	2009A	2010E	2011E	2012E
Recurring P/E (x) *	25.6	22.5	22.9	19.8	16.8
Recurring P/E @ target price (x) *	22.5	19.8	20.1	17.4	14.7
Reported P/E (x)	30.6	29.7	18.9	19.8	16.8
Dividend yield (%)	1.0	1.0	1.1	1.3	1.6
P/CF (x)	17.1	15.1	13.0	11.6	9.9
P/FCF (x)	neg	neg	neg	neg	46.9
Price/book (x)	2.1	2.0	1.7	1.6	1.5
Price/tangible book (x)	2.1	2.0	1.7	1.6	1.5
EV/EBITDA (x) **	18.5	17.3	13.9	12.5	10.6
EV/EBITDA @ target price (x) **	16.8	15.7	12.7	11.4	9.6
EV/invested capital (x)	1.5	1.5	1.4	1.3	1.2

* Pre exceptional, pre-goodwill and fully diluted

** EBITDA includes associate income and recurring non-operating income

Sources: NHPC Ltd; BNP Paribas estimates

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All share prices are as at market close on 9 October 2009 unless otherwise stated. Stock recommendations are based on absolute upside (downside), which we define as $(\text{target price} - \text{current price}) / \text{current price}$. If the upside is 10% or more, the recommendation is BUY. If the downside is 10% or more, the recommendation is REDUCE. For stocks where the upside or downside is less than 10%, the recommendation is HOLD. In addition, we have key buy and key sell lists in each market, which are our most commercial and/or actionable BUY and REDUCE calls and are limited to at most five key buys and five key sells in each market at any point in time.

Unless otherwise specified, these recommendations are set with a 12-month horizon. Thus, it is possible that future price volatility may cause a temporary mismatch between upside/downside for a stock based on market price and the formal recommendation.

*In most cases, the target price will equal the analyst's assessment of the current fair value of the stock. However, if the analyst doesn't think the market will reassess the stock over the specified time horizon due to a lack of events or catalysts, then the target price may differ from fair value. In most cases, therefore, our recommendation is an assessment of the mismatch between current market price and our assessment of current fair value.

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