Climate Change
India

HSBC Climate Change

HSBC Global Research

Wide spectrum of choices

India's climate investment opportunities revealed

- **Against the backdrop of the current weak macro situation, we believe that responding to climate change presents long-term growth opportunities for investors in India.**
- **India has strong potential as a low carbon economy, but it is also highly vulnerable to the projected impacts of climate change.**
- **We identify an initial set of 11 climate change themes, with cINR7.6trn (cUSD150bn) expected in investment between 2008 and 2017. Of the 15 beneficiary stocks under HSBC coverage, this report profiles seven current Overweights: BHEL, L&T, ONGC, PSL, RIL, Shree Renuka and Welspun Gujarat.**

India is the world's fifth largest emitter of CO_2, after China, the USA, the EU and Russia. But in relative terms, India is a low carbon economy, with per capita emissions about a quarter of the global average. In spite of projected growth in emissions, these are likely to remain below the developed country average. But India is one of the countries most exposed to the projected impacts of climate change, particularly on food production, water availability and coastal cities. Already 2.6% of GDP is spent each year on adapting to climate change.

Compared with the industrialised world, India has a 'wider spectrum of choices' as it confronts the global threat of climate change, with a large potential for technological leapfrogging. The Government of India has started to intensify its response to this strategic issue. On the back of its National Action Plan on Climate Change (NAPCC), launched in June, and a range of existing policies to promote low carbon power and energy efficiency, we have identified an initial set of investable themes focusing on the mitigation potential from curbing carbon emissions. These include wind, solar, hydro, bio-power, biofuels, buildings efficiency, industrial efficiency, power efficiency, cleaner coal, fuel switching and nuclear. We estimate that around INR7.6trn (cUSD150bn) in investments will be made in these themes in FY2008-17, yielding annual emission cuts 18% below 'business as usual' projections by 2017.

We identify a range of corporate beneficiaries from these themes, including 15 currently under equity coverage from HSBC and profile the seven stocks where HSBC currently has an Overweight rating.

27 November 2008

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Issuer of report: HSBC Bank plc

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We gratefully acknowledge the assistance of R Chaturvedi, S Goel and D Saravanan of the HSBC Climate Change Centre of Excellence in the preparation of this report.

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Summary

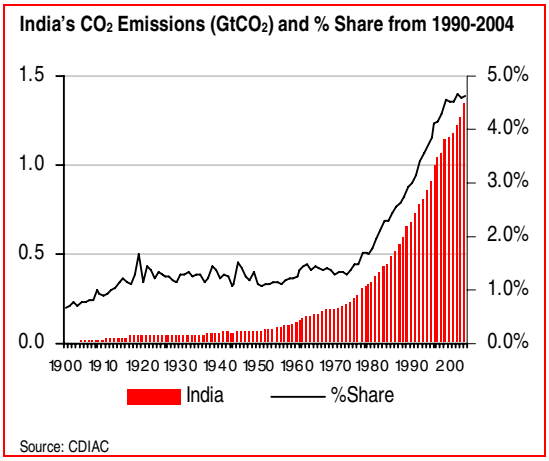
- A range of key climate investment opportunities is emerging in India
- We estimate a cINR7.6trn (cUSD150bn) market over FY 2008-17e in 11 investable themes
- Our list of beneficiaries includes 15 stocks under coverage with seven Overweights: BHEL, L&T, ONGC, PSL ltd, RIL, Shree Renuka, Welspun Gujarat

Awakening to climate change

The publication of India's NAPCC[1] on 30 June 2008 marked an important stage in the evolution of the country's approach to climate change. Launched ahead of the G-8 Hokkaido summit, the plan highlighted India's role as a pivotal country - not just in terms of the ongoing global negotiations, but also in its attractiveness to investors seeking out growth opportunities in this burgeoning arena.

India's current stance on climate change is based on a set of sound foundations:

- **Responsibility:** India accounts for less than 5%[2] of total carbon dioxide emissions globally since 1900, compared with some 21% generated by the USA. As climate change is a 'stock and flow' problem, India's historic responsibility is relatively small – and it expects the industrialised world to (finally) take the lead in cutting emissions.



- **Equity:** India's per-capita emissions stand at 2 tonnes – a tenth of the US amount, and a quarter of the global average. India argues that each person on the planet has an equal entitlement to the global atmosphere, and has taken a firm and responsible stance by committing to stay below the developed country per-capita average.
- **Vulnerability:** India is highly exposed to the impacts of climate change – and its vulnerability is heightened by low income levels and an absence of adaptive capacity.

[1] *http://pmindia.nic.in/Pg01-52.pdf?bcsi_scan_B7E11C3ABEF10E5A=0&bcsi_scan_filename=Pg01-52.pdf*
[2] *http://cdiac.ornl.gov/ftp/trends/emissions/ind.dat - August 2008*

For this reason, the government has identified adaptation - protecting its people – as its primary climate change priority.

- **Sustainability:** Action to curb greenhouse gas emissions needs to be entirely consistent with India's overriding priorities of economic growth and eradicating poverty – in other words, emission cuts will be generated only as co-benefits of its wider strategy for sustainable development.
- **Opportunity:** India is already the world's fourth largest market for wind power, and the second largest supplier of carbon credits under the Clean Development Mechanism. Policymakers and business leaders recognise that sizeable growth opportunities lie ahead.

Starting a marathon

We see the NAPCC as the starting point of a marathon which will last many decades. In essence, it is a 'plan for a plan', kick-starting eight national missions, which will become the pillars of India's effort on climate related aspects. The eight missions are scheduled to report to the Prime Minister's Council on Climate Change by December 2008, recommending the specific measures needed to accelerate action to boost solar, energy efficiency and waste management as well as strengthening the resilience of agriculture, forests and water resources. Each mission will also report publicly on its annual performance. These reports will be critical to enable investors to judge the scale of incentives that the government intends to put in place to drive this agenda.

The investment potential

On the basis of the trajectory laid out by the NAPCC, India's existing policies and our own analysis, we have identified 11 investment themes that have sizeable market drivers and a range of companies with material exposure. These themes, with a total investment potential of INR7.6trn, are listed in the table below

Our methodology

We estimate the investments over five-year and 10-year time frames, aligned with the Government of India's XIth (FY 2008-12) and XIIth five-year plans (FY 2013-17).

Estimated investments across climate change themes with potential beneficiaries

Sector / Industry	FY 2008-2012 INR bn	FY 2008-2017 INR bn	Potential beneficiaries (listed companies)
Renewable			
Solar	55	200	Moser Baer, XL Telecom & Energy, Webel Solar
Wind	500	1340	Suzlon Energy, Shriram EPC, Indowind
Small hydro	65	140	Jai Prakash Associates,BHEL, Maytas Infrastructure, Alstom, HCC, L&T, GMR, Gammon
Biomass power	60	120	Shriram EPC, Gammon, Surya Chakra power, Thermax Ltd, Triveni Engineering and Industries
Biofuels	140	1470	Praj Industries, Alfa Laval (India), Bajaj Hindustan, Shri Renuka Sugars, Balrampur Chinni Mills
Low carbon power			
Clean coal technologies (Supercritical)	350	1700	BnbHEL, L&T
Fuel switch options (NG)	160	700	ONGC, RIL, Welspun Gujarat Stahl Rohren Ltd, Jindal Saw ,PSL Ltd
Nuclear	140	1200	L&T, BHEL
Energy efficiency			
Building efficiency (CFL)	110	200	Asian Electronics, Havells India Ltd , Phoenix Lamps, Surya Roshni ltd
Industrial efficiency	25	55	ABB India, Triveni Engineering and Industries, Thermax India ,Alfa Laval, Crompton Greaves
Power supply efficiency	250	500	Bharat Heavy Electrical (BHEL), ABB India, Crompton Greaves, ICSA India ltd, KLG Systel
Total	**1855**	**7625**	

Source: HSBC, Note: Profiles of beneficiary companies under coverage of HSBC analysts with an Overweight rating are summarised in the company section of note

In terms of power generation, we have projected the likely capacity additions in MW terms for wind, solar, biomass power, small hydro, clean coal technologies and nuclear, and on the basis of our benchmark capex rate we have calculated the investment potential. For the Solar PV theme, we have calculated the investment required to construct 1,000MW of new manufacturing capacity.

For the energy efficiency theme, we have examined the targeted savings over the periods in MW and using our benchmark cost per MW concluded with the required investment levels. Our estimates of investment potential in the energy efficient lighting industry take into consideration a marginal reduction in the price of compact fluorescent lamps (CFL) year-on-year.

For the biofuel sector, the investment figure relates to the revenue potential for bio-fuel producers based on our assumptions on blending targets, oil consumption and bio-fuel prices over the estimate period.

Risks to our assumptions

The sharp weakening of both the national and global macro-economic environment has thrown into question the durability of climate change as an investment theme. Certainly, the prospect of declining growth and the contraction in credit availability will be deterrents to our projected investments in the short term. Set against this, we are confident that the political momentum behind action to boost clean energy, energy security and a low carbon economy remains strong – and has actually been improved with the recent election of Barack Obama in the USA. This makes a domestic boost for clean energy more likely in the USA, and also boosts the chances of achieving a global deal on climate change at Copenhagen in December 2009. This is important, as further action by India on climate change is dependent on confidence building measures from the G-8, particularly around ambitious targets to cut their emissions as well as the provision of financial assistance and technology transfer. A failure to reach agreement in Copenhagen would correspondingly erode political will in India.

Domestically, the major risks to our assumptions are from: (i) policy slippage in the run-up to the scheduled general election by May 2009 and loss of policy priority thereafter (ii) disagreement between state governments and the central government on climate policies (iii) a failure to implement the agreed policies (iv) an absence of expected improvements in technology cost and effectiveness (v) a decline in benchmark prices from the assumed levels.

Estimated emission savings from investments

Making these investments will have a significant impact on India's emission profile. The table below shows the estimated annual emission savings from FY2013 onwards based on estimated investments in FY2008-12 and from FY2018 onwards based on estimated investments made during FY2008-17.

Estimated annual emission savings

	FY 2013 onwards $mtCO_2$	FY 2018 onwards $mtCO_2$
Renewables		
Wind	18.4	49.1
Solar	0.2	1.1
Small hydro	2.5	5.5
Biomass power	6.8	13.7
Biofuels	3.9	32.3
Low carbon power		
Cleaner coal technologies	5.7	28.1
Natural gas fuel switching	12.3	53.2
Nuclear	11.3	96.4
Energy efficiency		
Industrial efficiency	14	30.8
Building efficiency	58.5	114.1
Power supply efficiency	23.8	55.7
Total	**157**	**480**

Source: HSBC

According to the Pew Centre on Global Climate Change, India's projected 'business as usual' greenhouse emissions by 2017 will be around 2.7 Gt CO_2[3]. We estimate that the proposed measures can help to mitigate 0.48 Gt of CO_2 emissions by 2017 thus reducing total BAU emissions by 18%.

[3] *Climate change mitigation measure in India, Sept 2008, Pew Centre of Climate Change*

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Business beneficiaries

Among the range of potential beneficiaries from this projected investment shift, we have identified 15 equities under HSBC coverage, listed below. In our company section of this note, we provide a brief profile of the seven companies which currently have an Overweight rating.

Note

In this report, two measures of climate changing emissions are given: the first relates to emissions of CO_2, the main greenhouse gas, from fossil fuel use and cement production, and is given in tonnes of CO_2. The second covers all greenhouse gases (including CO_2 from land use change, methane, nitrous oxide and fluorinated gases) and is given in tonnes of CO_2 equivalent (CO_2-e).

Beneficiary companies under HSBC coverage with ratings and target prices

Company	Reuters ticker	Rating	Share price INR	Target price (INR)	Theme
BHEL	BHEL.BO	Overweight (V)	1,302.0	1,750	Cleaner coal, Nuclear, Power supply efficiency
Larsen & Toubro	LART.BO	Overweight (V)	758.7	1250	Cleaner coal, Nuclear
ONGC	ONGC.BO	Overweight	678.5	1470	Natural gas fuel switching
PSL Ltd	PSLH.BO	Overweight (V)	89.5	170	Natural gas fuel switching
Reliance Industries	RELI.BO	Overweight (V)	1,144.8	2,160	Natural gas fuel switching
Shree Renuka sugars	SRES.BO	Overweight (V)	51.2	80	Biofuels
Welspun Gujarat	WGSR.BO	Overweight (V)	93.3	160	Natural gas fuel switching
Balrampur Chini	BACH.BO	Neutral (V)	35.4		Biofuels
GAIL	GAIL.BO	Neutral (V)	199.4		Natural gas fuel switching
Havells India	HVEL.BO	Neutral (V)	142.6		Building efficiency
Thermax	THMX.BO	Neutral (V)	195.5		Industrial efficiency
Suzlon	SUZL.NS	Neutral (V)	46.8		Wind
ABB India	ABB.BO	Underweight (V)	430.1		Industrial efficiency
Bajaj Hindusthan	BJHN.BO	Underweight (V)	41.6		Bio-fuels
Jindal Saw	JIND.BO	Underweight (V)	270.6		Natural gas fuel switching

Note: Closing price as of 24 Nov 2008
Source: HSBC

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India's climate profile

- India has a relatively small carbon footprint
- Wind and carbon markets are generating strong revenue growth
- 700 million people are vulnerable to a changing climate

Many feet, small footprints

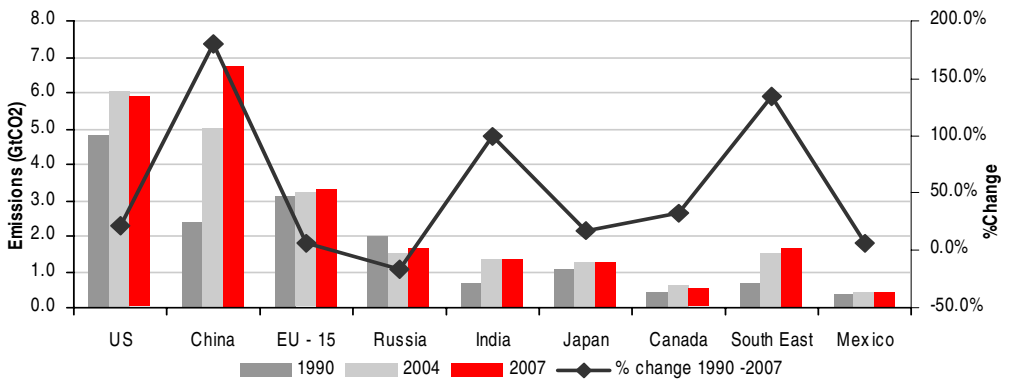
With a population of over 1.1 billion, India has a relatively small carbon footprint. Since 1900, India's contributions to global emissions of carbon dioxide have amounted to less than 5% of the total, according to CDIAC. But India's overall responsibility is probably much less than this. For example, if the absorptive capacity of the oceans is shared equally among the world's inhabitants then India's share falls sharply to just 0.3%[4].

India's CO_2 emissions from fossil fuel combustion are certainly on an upward curve, almost doubling since 1990. However, these have stayed relatively flat since 2004. As a result, India is the fifth largest emitter of CO_2 in absolute terms, behind China, the USA, the EU and Russia. In per-capita terms, taking all greenhouse gases into account, India's current per-capita footprint stands at around 2 tonnes, a third of China's and a tenth of the USA's (illustrated on page 10).

India's emissions have been curbed by a combination of poverty and suppressed demand for power. More than 50% of Indian households in rural areas still do not have access to electricity, ensuring that per-capita electricity consumption is a quarter of the world average.[5]

India's relatively small carbon footprint, when calculated in absolute and per-capita terms, is

Regional sources of emissions of CO_2 from fossil fuel use & cement and percentage growth 1970-2007



Source: Netherlands Environmental Assessment Agency, 2008

[4] *Muller et al, October 2007*
http://www.oxfordclimatepolicy.org/publications/DifferentiatingResponsibility.pdf

5 Woods Hole, 2007
http://www.whrc.org/about_us/PDF/2007_WHRC_AR.pdf

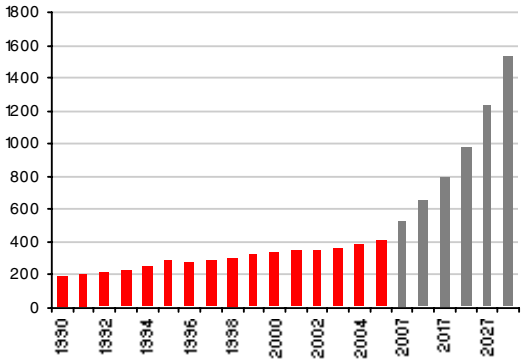
perhaps not a great surprise. What is more revealing from an economic – and investment – perspective is its low carbon intensity, in other words, the amount of emissions per dollar of GDP adjusted for purchasing power parity. India's ability to squeeze extra value out of each kilogram of carbon started low and has continued to improve since 1990. In 2004, the country emitted nearly 300 tonnes of CO_2 for each million USD of GDP, compared with 610t/USDm in China and 701t/USDm in the USA, and a world average of 492t/USDm. By 2030, the US Energy Information Administration expects India's carbon intensity to fall to just 138t/USDm, an annual improvement of some 2.9%, outstripping the global average improvement of 2.1%.

Globally and within India, power generation and industry are the two largest sources of greenhouse gases. India's rural base means that agriculture contributes 28% of national emissions, double the global proportion. While tropical deforestation contributes 17% of global emissions, in India, forests are a minor source of net emissions. India's emissions from the transport sector are half the global level.

Powering ahead

With power the primary source of emissions, understanding India's expansion plans is essential to comprehending the country's carbon trajectory. Although power capacity increased only 21,180 MW under the last Five Year Plan, this is set to grow four-fold in the current planning period to more than 80,000MW.

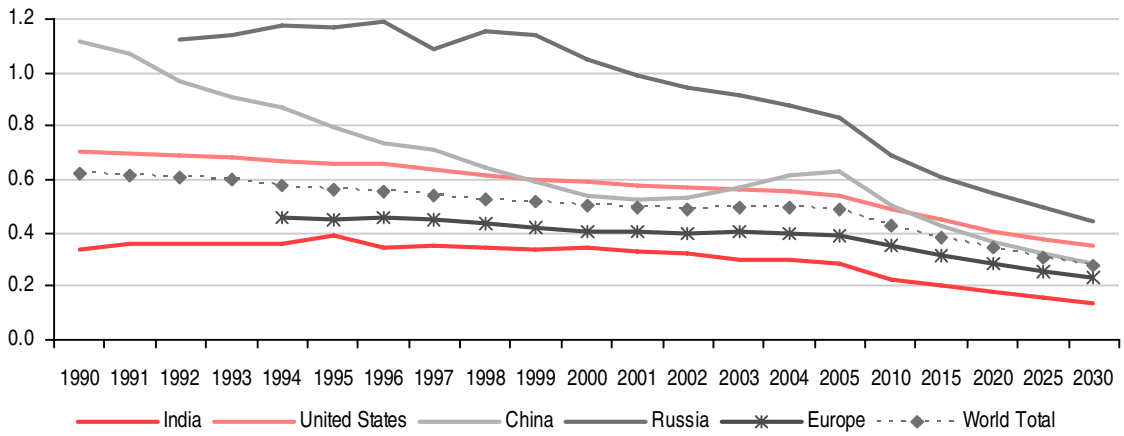
Growth in primary energy consumption in India (in mtoe)



Source: Integrated Energy Policy 2005, Planning Commission,

India has the fourth largest coal reserves in the world - after the US, Russia and China – and coal-fired power accounts for more than half of the

Carbon Dioxide Intensity – '000 tCO2 per Million USD of GDPppp

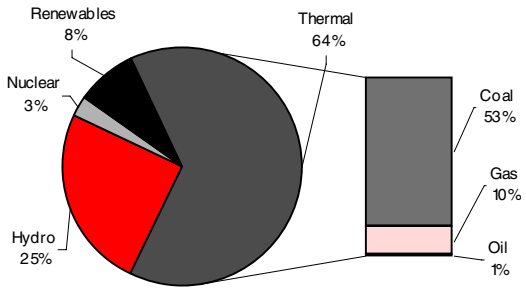


Source: Energy Information Administration / International Energy Outlook 2007

energy mix, followed by hydro electricity at 25%, with renewable contributing 8%, three-quarters of which is wind.

Power sector emissions have been following a steady upward trend, rising from 400m tonne in 2000-01 to 500m tonne in 2006-7, and projected to climb further to 660m tonne by 2012, according to the Central Electricity Authority (CEA).

Power generation mix in India (31 May 2008)

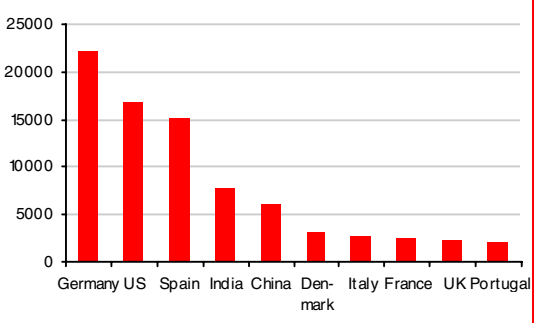


Source: CEA

India No. 4 in world wind

At the end of 2007, India had installed wind turbine capacity of 7,840MW, making it the fourth largest wind energy base in the world, after Germany, the USA and Spain. During 2007, India added around 1,700MW of wind capacity. HSBC estimates that new wind installations in the country will continue to grow at a CAGR of c.11% between 2007 and 2012. As part of the current 11th Plan, the Government's target is to boost wind capacity to 10,500MW, and total renewable energy to 14,000 MW.

Cumulative installed capacity of wind turbines globally (MW)

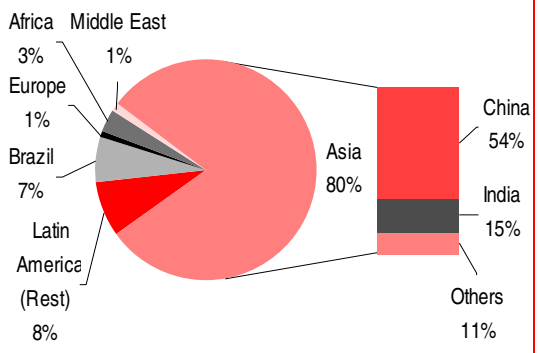


Source: Make Consulting, HSBC

Well-placed in carbon markets

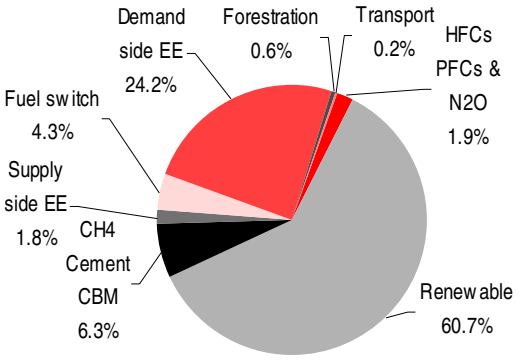
With the introduction of the Kyoto Protocol, a burgeoning global carbon market has emerged, within which India has become a leading player. As part of the Protocol's flexible mechanisms, emission reduction projects can be established in developing countries under the Clean Development Mechanism (CDM). The resulting certified emission reductions (CERs) can be used by industrialised country governments and companies to fulfil their commitments under the Protocol. Currently, India has 31% of total projects registered with UNFCCC, ahead of China with 23%. However, China holds a 37% market share in terms of CDM revenues (by issued CERs), leaving India behind with 25%. Due to the larger size of China's projects, India's slice of the market is projected to decline to 15% by 2012, while China's share is estimated to increase to around 54%.

Projected CDM market share in 2012



Source: CDM Pipeline - 1 October 2008

CDM projects spread in India



Source: CDM Pipeline - 1 October 2008

India has a better balance of projects under the CDM, however, with nearly two-thirds of projects in renewables and more than a quarter in energy efficiency. As of October 2008, renewable energy projects constituted 648 out of 1,079 projects in the Indian CDM pipeline[6]. These projects have a potential to generate c160m tonnes of CERs by 2012. At a price of EUR20 per tonne, these CERs will generate revenues in India of INR200bn (EUR3.2bn). Carbon finance through the CDM works to raise the project IRRs by 0.5-3.0%, according to the World Bank. At a global level, the World Bank estimates that the USD12 billion CDM market leveraged a further USD33 billion in additional investment in clean energy, and a similar ratio is likely to apply in India as well. In India, the CDM has leveraged 241 wind projects, equivalent to 4,319 MW, and 106 hydro projects, equivalent to 2,143 MW[6].

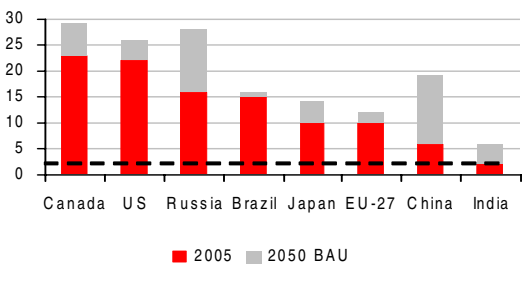
India's carbon outlook

Internationally, a consensus is emerging that global emission of CO_2 need to be halved by 2050 to prevent dangerous climate change. According to a recent paper[7] by Nicholas Stern, *Key Elements of a Global Deal on Climate Change,* average per-capita CO2 emissions need to fall from around 7 tonnes today to around 2 tonnes in 2050.

On a business as usual basis, India's emissions are projected to rise from 2 tonnes today to some 6 tonnes in 2050. Over the same period, the USA's per-capita footprint would grow from 22 to 26 tonnes, and China's would expand from 6 to 19 tonnes. This would leave India comfortably at the bottom of the pack of major nations.

It is in this context that Prime Minister Manmohan Singh's pledge to keep India's per-capita emissions below the developed world

Current and projected per-capita CO_2e emissions



Source: The Climate Group, Breaking the Deadlock, 2008

6 *CDM Pipeline, Oct 2008*

7 *http://www.lse.ac.uk/collections/granthamInstitute/publications/KeyElementsOfAGlobalDeal_30Apr08.pdf*

average is critical. With leading European countries, such as France and the UK, also moving to the per-capita model as the benchmark for future negotiations, a scenario of 'contraction and convergence' is coming to the fore. In this scenario, industrialised countries would contract their emissions by 80-95% by 2050, and converge with the much lower emission profile of the developing world. The sobering aspect of Stern's latest calculations, however, is that over the long term, developing countries, such as India, will also need to bend their projected emissions trajectory if they are to stay below the 2 tonne benchmark.

India is a founding signatory to the UN Framework Convention on Climate Change and has ratified the 1997 Kyoto Protocol. As a developing country, it does not have any binding emission reduction targets – and the government remains opposed to taking on mandatory carbon curbs as part of the current negotiations for a successor to Kyoto. Overall, it remains unlikely that India will accept emission cuts for at least another decade.

Vulnerable to change

As a result of past emissions, the planet is committed to a certain degree of warming – and associated impacts – over the coming decades, with different impact on countries across the globe. India is considered highly vulnerable to climate change. Its 700m strong rural population is directly dependant on climate sensitive resources, notably water, biodiversity, mangroves, coastal zones and grasslands. This exposure is magnified by relatively low levels of adaptive capacity in terms of the financial and institutional resources to prevent and respond to the impacts of a changing climate.

India's first National Communication on climate change (NATCOM), in 2004, warned of the natural ecosystem coming under intense pressure, expressed in an increase in the severity of droughts and floods. It also predicted a decline in agricultural productivity. The results of the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report, published last year, confirmed that India was particularly vulnerable to the impacts of climate change. It highlighted the "extreme" risks faced by mega-deltas, such as the Ganges-Brahamputra to sea level rise and coastal flooding, as well as the "very high" risk of the disappearance of the Himalayan glaciers by 2035 if the Earth continues warming at the current rate. A 2007 World Bank study[8] also concluded that India is one of the most vulnerable countries, behind Bangladesh, China and Greece.

This year, a Confederation of Indian Industry (CII) report suggested that the possible climate change impacts on India could include:

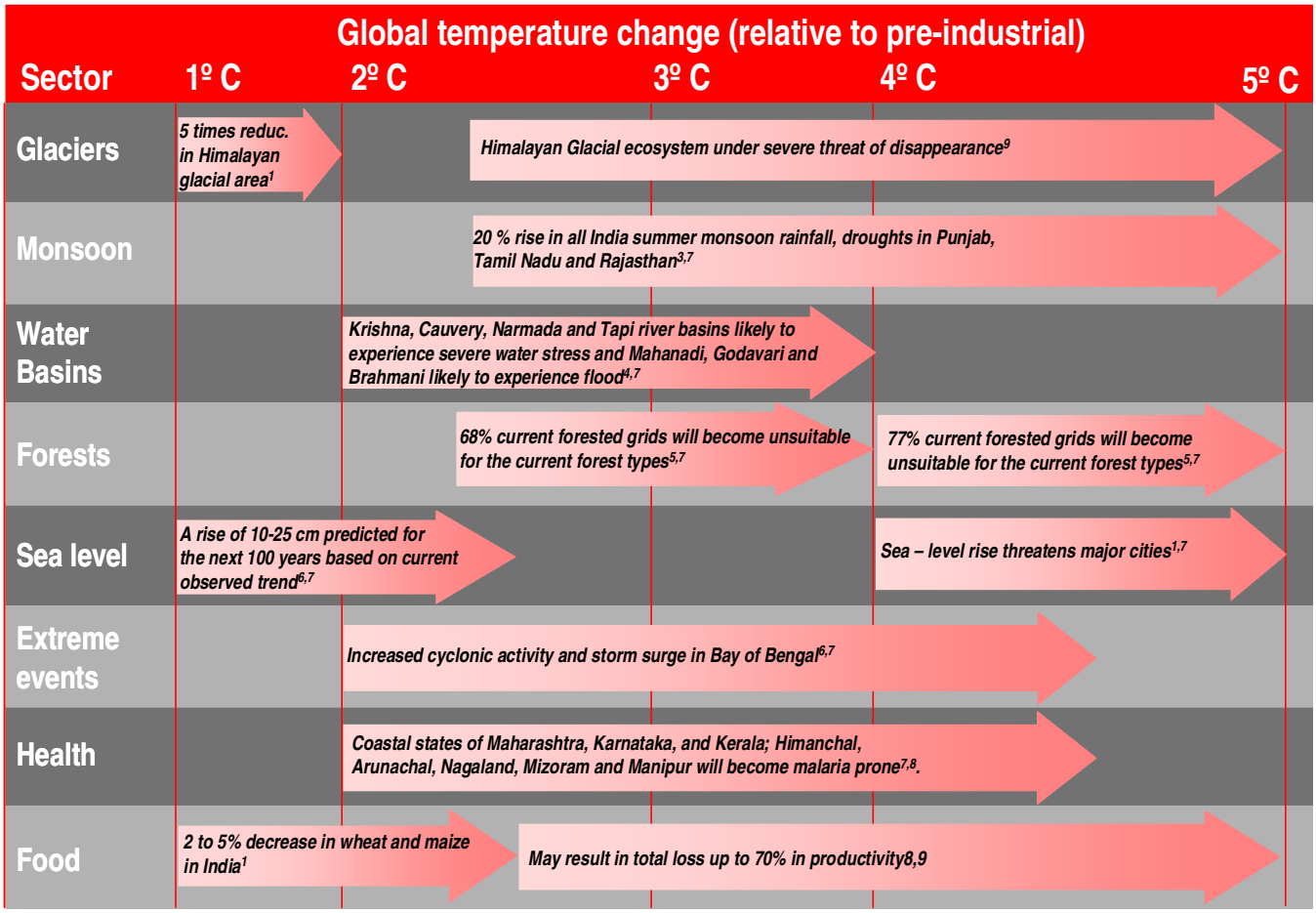
- Migration of 20% of the coastal population due to rising sea levels
- Increased exposure to tropical cyclones and flood risk affecting 25% of the country's population
- Desertion of around 20,000 villages
- Reduced crop yields of up to 10%[9]

Overall, this year's NAPCC takes a more cautious approach to the observed changes in India's climate, concluding that records do not yet suggest "any marked long-term trend in the frequency of large-scale droughts and floods". Equally, in terms of the Himalayan glaciers, the Plan argues that "it is too early to establish long-term trends". Looking ahead, the Plan recognises the potentially significant implications of projected temperature increases on the quantity

[8] World Bank, Country Stakes in Climate Change Negotiations: Two Dimensions of Vulnerability *http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2007/08/02/000158349_20070802104550/Rendered/PDF/wps4300.pdf*

[9] CII, Building a Low-carbon Indian economy, 2008.

Projected impacts of climate change in India associated with rising global temperatures



Source: 7 NATCOM, 2004; 3 Rupa Kumar et al., 2006; 9 Stern review, 2006; 4 Gosain et al., 2006; 5 Ravindranath et al., 2006; 6 Unnikrishnan et al., 2006; 8 Bhattacharya et al., 2006., 1 IPCC, 2007; 8 Challinor et al. 2006.

and quality of water, as well as on agriculture and forests, human health, exposure to extreme weather events and sea level rise.

India has already warmed by 0.4°C over the past century. The IPCC projects an annual mean surface temperature rise of 3.5°C under the A2 scenario and 2.5-4°C under the B2 scenario by the 2100, with warming more pronounced in northern India. Our overall assessment of India's projected climate impacts associated with rising temperatures is presented in the chart above.

Adaptation – the national priority

India is already spending INR1,030bn, or 2.6% of GDP, on adaptation to climate vulnerability.

Key initiatives include improving arid-land crops, minimising the adverse effects of drought, accelerating afforestation, promoting rain-water harvesting, introducing planning restrictions in coastal areas, introducing proactive disaster management programmes, controlling vector borne diseases, such as malaria, and providing crop insurance and credit support for farmers. In most cases, however, we have not identified clear investable ideas flowing from the adaptation agenda, and so the rest of this report focuses on the investment relevant themes that flow from the mitigation imperative – curbing carbon emissions.

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India's climate upside

- We have reviewed the National Plan and other government policies for material investment drivers
- As a result, we have identified 11 currently investable themes related to climate change in India
- Over the period FY 2008-17e, we estimate investments of INR3.2trn in renewables, INR0.75trn in energy efficiency and INR3.6trn in lower carbon power technologies

Taking our cue from the Action Plan, we have reviewed the eight new National Missions. These are designed to produce "multi-pronged, long-term and integrated strategies" covering:

- Expanding solar energy
- Improving energy efficiency
- Better management of habitats (cities)
- Conserving water resources
- Protecting the Himalayan ecosystem
- Boosting Green India (forests)
- Encouraging more resilient agriculture
- Building a climate knowledge platform

The Plan also covers a range of other key areas of climate change policy, where programmes are already underway. These include:

- Cleaner coal
- Fuel switching
- Nuclear power
- Renewable energy
- Disaster Management
- Human Health

From these, we have identified what we consider to be investable themes that have material financial drivers behind them, and where equity investment opportunities exist. In this, our first report on climate change investing in India, we have chosen to focus on the key mitigation themes.

A more detailed assessment of the global potential of a range of climate change investment themes is provided in our September 2008 report, *Gathering Momentum.*

HSBC

Renewable energy

Building on India's long-standing framework for promoting renewables, the NAPCC is highly bullish about renewable energy technologies, arguing that it has "the potential to replace all current and foreseeable use of fossil fuels, for power generation, transportation, and industrial use, for all time to come".

Since the 2006 National Tariff Policy, the State Electricity Regulatory Commissions (SERCs) have been given the ability to mandate a minimum percentage electricity purchase from renewable sources, following which a number of states have set targets. The Plan proposes to tighten this by stipulating that from 2009-10, the renewable energy purchase may be set at 5% of total grid purchase and increased 1% each year for 10 years. This would exclude hydropower, with storage capacity in excess of daily peaking capacity. The Plan also proposes a 'renewable energy certificate' system, under which the Central Electricity Regulatory Commission (CERC) would issue certificates to the SERCs for procuring renewable-based power in excess of the national standard. Any SERCs that fall short of their renewable standard obligations would then be able buy certificates from the SERCs with surplus renewable energy procurement. In the event of some SERC still falling short, the CERC could impose a penalty as allowed under the Electricity Act of 2003.

We expect the CERC to issue the new regulations before March 2009, mandating Dynamic Renewable Portfolio standards, taking into consideration the current renewable generation capacity and proposed capacity additions.

Within the renewable energy theme, we believe that the strongest potential lies in wind, solar, biomass, small hydro and biofuels.

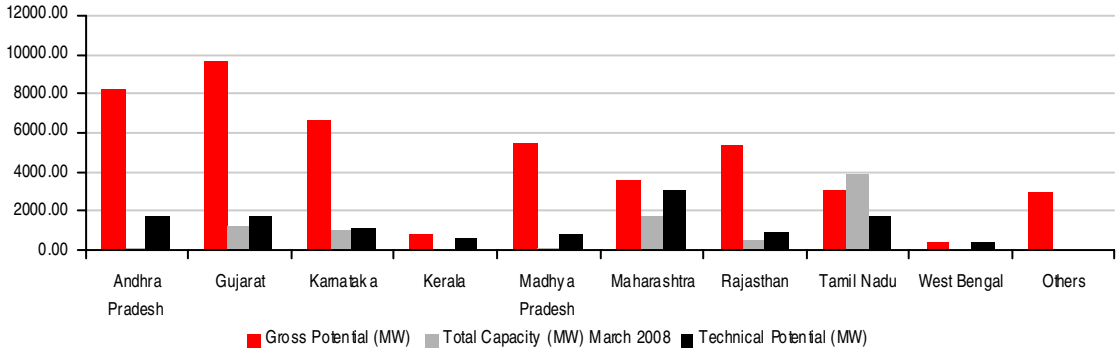
Theme 1: Wind energy

By 31 March 2008, only 6.2% of India's gross wind potential of 45,000MW had been tapped. This 8,757MW of commercial projects constituted around 6% of the total generation capacity of India. Growth has been rapid, with over 5400MW of wind capacity in the past five years, compared with just 1,400MW of nuclear energy.

To promote IPP investments in the wind sector, the Indian Ministry of New and Renewable Energy (MNRE) in August 2008 announced a generation based incentive (GBI) of INR0.50 per unit (USD0.01) of wind-power fed to the grid.

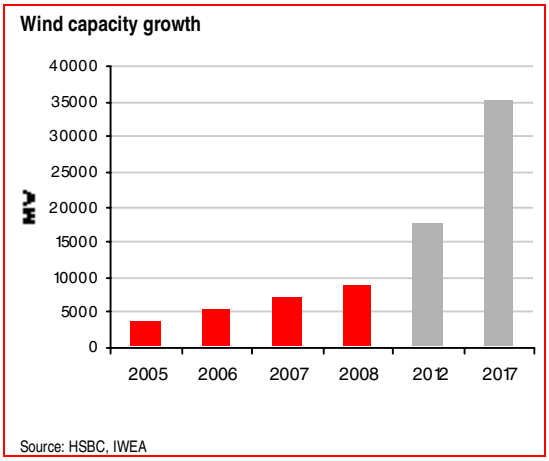
We estimate new capacity additions (both off shore and on shore) of 10,500MW over FY2008-12 and 17,500MW during FY 2013-17 . Assuming a per MW capital cost of INR48m, this

State Power: Wind Power Potential and Capacity in Key Indian States



Source: MNES 2008

results in an investment opportunity of INR 500bn and INR840bn respectively. Our calculations suggest that these investments could cut emissions by 49m tonnes of CO_2 p.a.



Wind beneficiaries

The major beneficiaries of wind energy growth are likely to be wind turbine manufacturers, such as Shriram EPC and Suzlon, as well as wind farm developers, such as Indowind.

Theme 2: Solar power

India receives solar energy equivalent to 5,000 trillion kWh per year – and the dedication of just 1% of India's land area to solar power could meet the country's entire electricity requirements up to 2030[10]. The NAPCC seeks to promote two different types of solar power - photovoltaic (PV) and solar thermal electricity generation (STEG), often known as concentrated solar power (CSP).

Concentrated Solar Power

STEG provides baseload electricity and can also work in hybrid mode, enabling co-firing with natural gas. Proposed STEG plants are large, generating at least 10MW and preferably more than 100MW to benefit from economies of scale (source: NEF).

India's climate action plan sets a goal to establish 1GW of concentrated solar power (CSP) generation capacity by 2017. This is less than 1% of proposed capacity additions in the XIth and XIIth five-year plans. Currently, the generation cost of STEG, at around INR20/unit for a plant efficiency of 18%, is much higher than the generation cost of coal or gas. But it is more in line with the generation costs of a diesel generator (DG) set. With current installed capacity of DG sets in India at 20,000 MW (15% of total grid capacity) and diesel subsidies in the range of INR12-23 per litre (for a crude oil price range of USD114-139 per barrel and diesel price of INR34.80/litre), we believe it would make commercial sense to divert the oil subsidy to incentivise the rapid commercialisation of solar thermal. We estimate that 1% of the total oil subsidy in 2007 could fund 3GW of solar thermal installations, assuming a subsidy of INR10/unit.

We estimate a total solar thermal generating capacity addition in the range of 200MW by FY2012 and another 800MW during FY2013-2017. We expect increasing competition in the solar thermal industry and technology improvements to result in capital cost reductions y-o-y, and have therefore assumed a per MW capital cost of INR160m for FY2008-12 and INR112m for FY2013-18. The action plan focuses on technology transfer and R&D to kick-start this initiative. This estimated 1,000MW solar capacity will provide CO_2 emission reductions of 1.1m tonnes per annum by FY 2018.

Photovoltaic

The NAPCC also aims at establishing integrated PV manufacturing capacity of 1GW per year by 2017 in India. By the end of 2008, we estimate that the total PV cell manufacturing capacity in India will stand at around c400MW, and we expect this to reach 1,250MW by 2010, although most of this capacity will not be integrated. We

[10] *http://mnre.gov.in/ July 2008*

assume integrated PV capacity installation of 1000MW by 2017, in line with the GoI target.

In 2007, the Government of India released its semiconductor policy with a special incentive package for promoting investments in the manufacture of semiconductors and photovoltaics. The policy states that "the Central Government or any of its agencies shall provide incentive of 20% of the capital expenditure during the first 10 years for the units in SEZ and 25% of the capital expenditure for non-SEZ units. Non-SEZ units shall be exempt from CVD." This incentive can be in the form of equity in the project, capital subsidy in the form of investment grants and interest subsidies.

Taken together, solar thermal and solar PV will drive investment of INR200bn for the 10-year estimate period.

Solar beneficiaries

Today, India is among the top 10 producers of solar cells and modules in the world, and its solar-tech industry continues to attract higher investment. Listed players, such as Moser Baer, XL Telecom & Energy and Webel Solar, derive considerable proportions of their revenues from the solar segment. Large industrial groups, such as BHEL (Overweight (V), target price INR1,750) and Reliance Industries (Overweight (V), TP INR2,160), have also made moves into this arena.

Theme 3: Small hydropower

India is endowed with a rich hydropower potential, ranking fifth in the world in terms of its usable potential. The CEA estimates that the economically exploitable potential of the river systems in India stands at 148,700MW, while capacity under operation is 28,000MW and an additional 14,000MW is under various stages of development. The CEA has also identified 56 sites for pumped storage schemes, with an aggregate installed capacity of 94,000MW and potential of 15,000MW generation from small hydro projects (SHP) (up to 25MW). The government's accelerated hydro development plan aims to build 50,000 MW of new hydro capacity by 2025-26[11].

A range of sustainability factors constrains the expansion of large hydro projects, including the displacement of local populations and loss of biodiversity. Large hydro also has its own carbon footprint, and the UNFCCC has excluded it from the CDM. As a result, we focus our attention on small hydro.

The installed capacity of SHP in India as of 31 March 2008 was 2181 MW (including 205 MW added in FY 2007-08). We estimate a capacity addition of 1,200MW during FY2008-12 and 1,400MW over the next five year plan, thereby providing an investment opportunity of INR65bn and INR75bn respectively, assuming a capex cost of INR55m per MW. Our estimates take into consideration the initiatives of states, such as Uttaranchal and Himachal Pradesh, that have significant hydro potential. The above-mentioned investments will provide emission savings of 5.5m tonnes per annum by 2018 onwards.

Small hydro-power beneficiaries

Major beneficiaries are likely to include companies such as BHEL (Overweight (V), target price INR1,750), GMR, Gammon, HCC, Jaiprakash Associates, L&T (Overweight (V), target price INR1,250) and Maytas Infrastructure Ltd.

Theme 4: Biomass power

An estimated 540 million tonnes per year of biomass is produced each year in India as residues from agriculture, agro-industrial activities, forestry, and plantations. The MNES estimates that 70-75% of this waste is used as fodder, fuel for domestic cooking and for other economic purposes, leaving behind 120-150m tonnes of usable agro-industrial

[11] *Building a low carbon Indian economy, CII, Jan 2008*

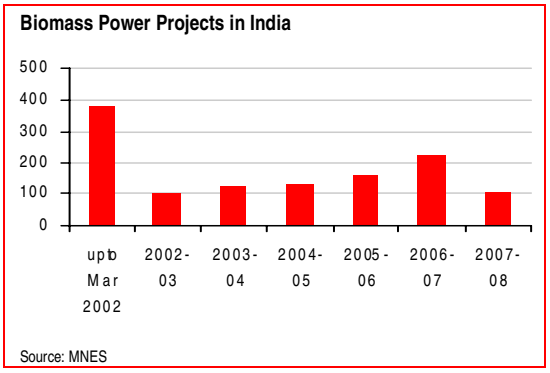
and agricultural residues, which can be made available for power generation. With the available technologies, this surplus agricultural residue can be used to generate more than 16,000MW of grid quality power.

In addition, if all the 550 sugar mills in the country switch over to modern techniques of co-generation, over 5,000MW of power can be produced. Thus, India can be considered to have biomass power potential of around 21,000MW. However, we believe it will not be possible to fully utilise this potential, as the transportation of biomass over large distances will make the generating facilities uneconomical.

With current installed capacity at 1407 MW[12] (including 223 MW added during the last financial year), we assume a capacity addition of 1500 MW over the current five-year plan period and an equivalent amount over the XIIth plan period. Assuming a capital expenditure of INR40m/MW, the targets provide an investment opportunity of INR120bn over the 10-year period, with corresponding savings of 14m tonnes of CO_2 per annum from 2018 onwards.

Bio-power beneficiaries

Biomass power generation is an unorganised sector with many small players across the country. Companies like Gammon, Shriram EPC, Suryachakra Power, along with Thermax and Triveni Engineering and Industries, are set to benefit.



[12] *Annual report, Ministry of Power, 2007-08*

Theme 5: Bio fuels

Bio-ethanol

Bio-ethanol in India is derived from sugar cane. Currently, bio-ethanol blending with gasoline stands at 5% in 9 States and 4 Union Territories. The government's target was expected to be increased to 10% by October 2008, but this has been deferred to October 2009.

We estimate that the shift from 5% blending to 10% across the country will require an additional 600m litres of ethanol, thus benefiting sugar companies, as well as biofuel equipment manufacturers and technology suppliers. In anticipation of an increase in ethanol demand, the sugar companies have increased their distillery capacities to manufacture ethanol from molasses and sugar cane in some cases.

We assume that the 5% mandate will continue until FY2009-10 and increase to 10% FY2010-11. However, from 2012-13 onwards, we assume a 2% increase y-o-y, reaching 20% by FY2017-18. We estimate ethanol demand will increase from 700m litres in FY 2008-09 to 1,600m litres in FY2010-11 and to 4,330m litres in FY 2017-18. This six-fold increase over nine years will only be possible with further development of second-generation technologies. Assuming the supply remains in line with mandate, we estimate the total revenues of bio-fuel producers at INR19bn in FY2008-09, increasing to INR112bn in FY2017-2018. Over the XIth plan period, we project bio-ethanol sales of INR140bn and aroundINR414bn during the XIIth plan period. Our estimates assume an ethanol price of INR26/litre.

Biodiesel

The National Mission on Bio-diesel has spurred the development of bio-diesel plantations in 26 states. Beyond this, the target is to produce sufficient biodiesel for 20% blending with vehicle diesel by 2017.

According to the Ministry of Petroleum and Natural Gas, diesel consumption in India stood at 42.8m ton in 2006-07, and we estimate that this will increase to FY59m tonnes by FY2017. According to India's 2004 NATCOM, 60%[13] of diesel is used as vehicular fuel and the 20% blending regulation will create demand for 8,300m litres of bio diesel by FY2017, thereby avoiding 22.5m tonnes of CO_2 emissions. However we assume that the 20% blending target by FY 2017 will be achieved gradually, with diesel blending to start from the XIIth year plan with 5% in FY2013 onwards. Assuming a bio-diesel price of INR36/litre, we project a revenue potential of INR912bn over the five-year period.

However, wider sustainability concerns place a potential constraint on this growth trajectory in terms of food security, land availability and environmental impacts. The low crop yields of non-food feedstocks, such as jatropha and pongamia, are also posing a challenge in certain states. We believe the success of second-generation bio-fuel technologies is necessary to achieve the 20% blending target for bio-fuels.

Biofuels beneficiaries

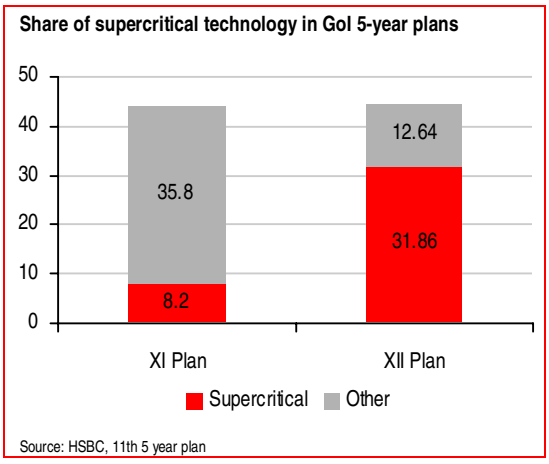
Likely beneficiaries of the programme include Alfa Laval (India), Bajaj Hindusthan, Balrampur Chini, Praj Industries and Shree Renuka Sugars (Overweight (V), target price INR80).

Lower carbon power

Coal forms the mainstay of India's energy matrix and is set to remain dominant for the foreseeable future. The Government of India is driving a process to introduce more efficient coal generation, notably through Integrated Gasification Combined Cycle (IGCC), supercritical and ultra supercritical technologies, all of which have important side-benefits from a climate change perspective. It is also set to expand nuclear power generation, another low carbon electricity source, as well as promote fuel switching to lower carbon natural gas.

Theme 6: Cleaner coal

Supercritical and ultra supercritical technologies offer thermal efficiency of 40% and 45%, respectively, compared to 35% offered by sub-critical plants in India. For every 2% increase in efficiency, there is a 5% reduction in CO_2 emissions. The government has launched an initiative to utilise this lower carbon technology by developing coal-based ultra-mega power projects (UMPP) in India, each with a capacity of 4,000MW or above and involving an estimated investment of around INR160bn. Nine sites have been identified by the CEA in nine states for the proposed UMPPs. Work is in progress on three sites and another site is likely to be allocated soon. The share of supercritical power plants in the XIth and XIIth five-year plans increases dramatically, from 19% to 72%, showing the GoI's commitment to cleaner coal technologies.



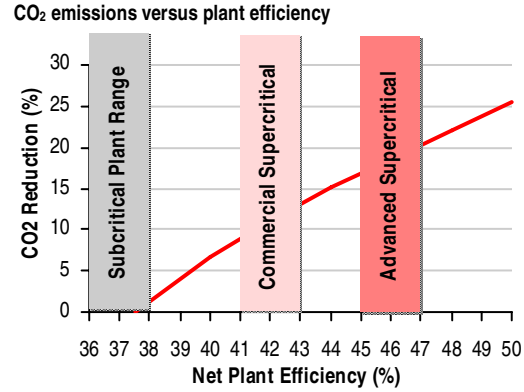
The CDM's executive board has also approved supercritical coal combustion plants for CERs in 2007. But this step is not without its critics. Some argue that deploying supercritical technology is not strictly additional according to the terms of the CDM. Others oppose the use of CDM incentives to expand fossil fuel production.

[13] National communication to UFCCC, Govt of India ,2004

Apart from supercritical technology, IGCC technology can make coal-based power generation at least 10% more efficient. In addition, for every 1% improvement in efficiency, there is a 2% decrease in CO_2 emissions. BHEL (Overweight (V), target price INR1,750) has conducted R&D to scale up this technology to commercial size and has signed an agreement with Andhra Pradesh Generation Company (APGENCO) to set up a 125MW IGCC plant at Vijayawada, Andhra Pradesh, India.

One apparent gap in India's cleaner coal programmes is Carbon Capture and Storage. The IEA projects that CCS will account for 19% of the required global carbon abatement by 2050. The G-8 has highlighted the importance of this initiative, and legislative moves in Australia, the EU and the USA will shortly define the framework for a first wave of demonstration projects. India remains cautious about the applicability of CCS and is waiting for it to become proven before considering applications domestically. A recent World Bank study also suggests that India has a very low underground sequestration potential, at only 24 years of current emissions, compared with 202 years for Bangladesh and 1,678 for Vietnam.

Assuming a benchmark cost of INR45m per MW, we estimate a capital investment of INR1700bn in supercritical technology over FY 2008-17, with INR350bn in FY 2007-12 and INR1350bn in FY 2013-18. These investments are likely to result in annual emission savings of 28m tonne from 2017.



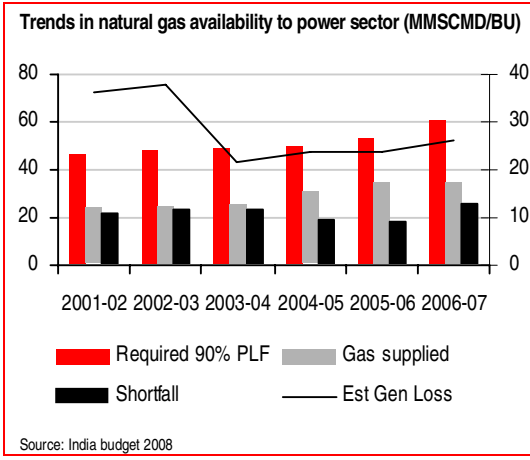
Source: Electric Power Research Institute

Cleaner coal beneficiaries

We expect companies such as BHEL (Overweight (V), target price INR1,750), and L&T (Overweight (V), target price INR1,250) to be the key beneficiaries.

Theme 7: Natural gas fuel switching

About 10% of the installed generating capacity in India is natural-gas based. However, due to a shortage of natural gas, the entire capacity does not operate at the required levels, as illustrated in the following chart.

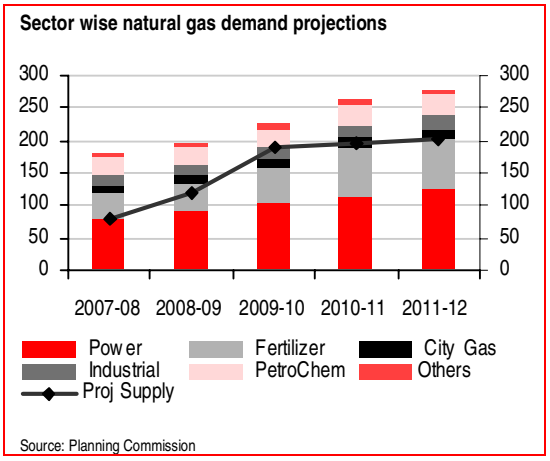


Source: India budget 2008

It is estimated that natural gas demand in India stood at 179 metric million standard cubic metres per day (MMSCMD) in 2007, with domestic supply of 80MMSCMD and imports of 18MMSCMD, resulting in huge demand

remaining unmet[14]. However, with new gas finds, especially those in the Krishna Godavari basin, we expect the supply situation to improve.

The demand-supply gap, however, is likely to remain.



As emissions from natural gas-based generating stations are 50% less than emissions from coal-based generating stations, there is substantial climate upside from fuel switching in India. The NAPCC also specifies the government's aim of shifting to cleaner fuel options, and we feel that this will give a considerable boost to gas-based generation, contingent on the availability of gas.

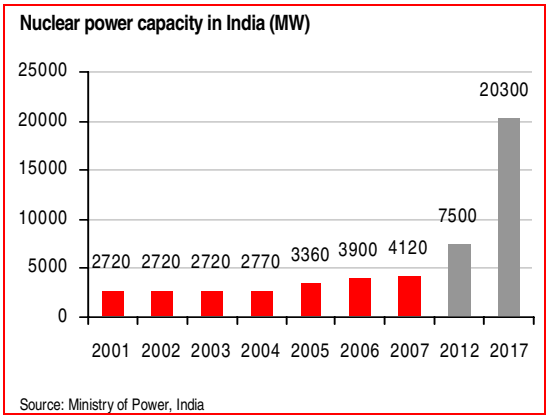
Our forecasts are based on the Planning Commission estimated capacity addition during the XIth (4714MW) and XIIth five-year (15,583MW) plans. Assuming capital expenditure costs of INR35m/MW, we see an investment opportunity of INR700bn over FY 2008-17, with INR160bn in FY 2007-12 and INR540bn in FY 2013-18. These investments are likely to result in emission savings of 53m tonnes p.a.

Natural gas beneficiaries

We think that likely beneficiaries will include companies indirectly in the gas business, such as ONGC (Overweight, target price INR1,470) and Reliance Industries (Overweight (V), target price INR2,160), along with companies manufacturing pipes and providing gas transport infrastructure, such as GAIL, Welpsun Gujarat (Overweight (V), target price INR160), Jindal Saw, and PSL ltd (Overweight (V), target price INR170).

Theme 8: Nuclear Power

At the end of 2007, India had 4,120MW of nuclear capacity under operation, contributing 2.5% of total power generation. According to the CEA update of 31 August 2008, some 3380 MW is under construction. The Planning Commission estimates another 12800MW will be added during the next five-year plan (see figure below).



Long a controversial energy option from a security and environmental perspective, nuclear power is recognised by the IPCC as "an effective GHG mitigation option" (see *Gathering Momentum*, September 2008, for further details). This is particularly the case in India following the recent agreement of the nuclear deal with the USA and the rest of the Nuclear Suppliers Group. This ends 34 years of nuclear isolation for India and opens up the way for India to trade in civilian nuclear technology, not just with the US, but also with other countries, such as France and Russia. France has already inked a pact with India, and Russia too has expressed a keenness to cooperate on the same.

[14] *http://www.investmentcommission.in/petroleum_&_natural_gas.htm*

The Government of India has ambitious plans to supply 25% (310GW) of electricity from nuclear power by 205015. Industry associations, such as FICCI and Assocham, are also bullish. According to FICCI, India has the potential to generate 60,000MW of nuclear power over the next 25 years, requiring an investment of over USD100bn; Assocham quotes a minimum of USD45bn of investments in the next 15 years. However, serious concerns remain around nuclear energy – primarily safety, disposal of long-term radioactive waste and nuclear proliferation. This is in addition to high upfront capital costs and the long lead-time for project completion. Furthermore, local protests against the location of new nuclear facilities cannot be discounted, particularly in light of recent controversies regarding land allotment for Special Economic Zones (SEZs) in India.

India has a reasonable level of uranium resources, of 54,000 tonnes. India will have to import uranium when its nuclear capacity touches 20000 MW. However India has reserves of 290,000 tonnes of thorium – about one quarter of the world total – and these are intended to fuel India's nuclear power programme in the longer term[16].

The nuclear generation programme in India is entirely controlled by government. HSBC estimates[17] that new nuclear capacity of up to 1,900MW will be added during the current five-year plan and the remaining 1,480MW (already under construction) will be commissioned during the XIIth plan.

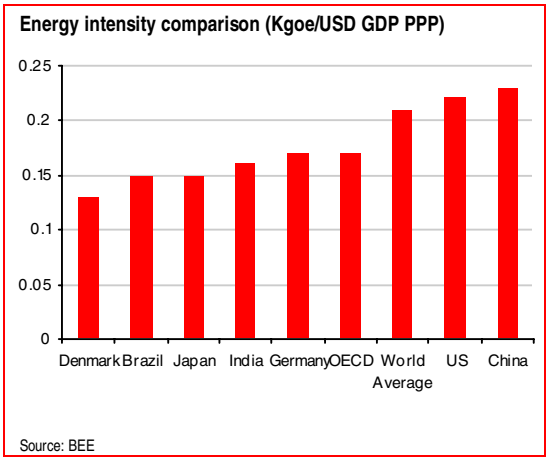
Assuming a capex cost of INR75m/MW, we estimate an investment potential of INR250bn during the XIth plan period. For the XII plan period, we have used capacity addition estimates from the Ministry of Power (MOP) to project an investment potential of INR950bn. These investments will provide emission savings of 96m tonnes p.a. by 2017.

Nuclear beneficiaries

The state-owned NPCIL is the dominant player in the nuclear sector. Listed beneficiaries are set to include BHEL (OW (V), TP INR1,750) and L&T (OW (V), TP INR1,250).

Energy efficiency

India's economy is relatively energy efficient by international standards, with an intensity level of 0.17 Kg[18] of oil equivalent (Kgoe) per unit of GDP in USD purchasing power parity. This is better than the global average, as well as China's and the USA's, but lags behind countries such as Denmark, Japan and Brazil.



Market incentives for consumers and producers to adopt efficient practices are, however, blunted in a number of crucial areas, due to a range of energy subsidies on oil products, electricity tariffs for agricultural users and key industries, such as fertilisers. Indeed, the NAPCC highlights that it is "imperative that fertiliser subsidies be restructured to eliminate such absence of incentive" for energy efficiency investments. The political feasibility of subsidy reform is, of course, another matter.

[15] *Evolving Indian Nuclear Programme, Atomic Energy Commission, July 2008*
[16] *http://www.world-nuclear.org/info/inf53.html*
[17] *Indian Power Utilities' released 29 September 2008*
[18] *Energy Conservation and efficiency roadmap, BEE , June 2007*

The new National Mission for Enhanced Energy Efficiency aims to deliver 10,000MW of power savings by 2012. It focuses on energy efficiency across industry, building and electricity transmission. We believe energy efficiency offers higher return per unit of investment *vis a vis* most of the themes.

Theme 9: Industrial energy efficiency

The Energy Conservation Act, 2001 identifies nine energy intensive industries – thermal power stations, fertiliser, cement, iron and steel, chlor-alkali, aluminium, railways, textile, and pulp and paper – that consume 65% of total industrial energy. According to a study by CII, Indian industry has the potential to reduce its energy consumption by 20%-30%[19]. Energy audits have been made mandatory for these energy-intensive industries. The potential for energy efficiency is considerable, as illustrated in the following table

Energy saving potential in some energy intensive industries

Sector	Energy cost as % of manufacturing cost	Energy Saving Potential
Caustic Chlor	60-65%	15%
Cement	40-45%	15%
Aluminium	35-45%	10%
Foundry	20-25%	20%
Paper	25-30%	25%
Chemical	10-30%	15%
Engineering	03-15%	10%

Source: CII, http://greenbusinesscentre.com/images/Photos/Ind12.pdf

The National Action Plan estimates that energy efficiency programmes could cut CO_2 emissions from industrial fuel usage and electricity consumption by 605m tonnes[20] by 2031, a 16% reduction compared to business as usual. The national action plan proposes the following initiatives to enhance industrial energy efficiency:

- Mandating specific energy savings in energy intensive industries and introducing a tradable certificate system ('white certificates') to enable companies with excess savings to trade with companies falling below the target, or to bank the savings for the next cycle.
- Tax incentives, such as differential rates for energy efficient appliances.
- Energy efficiency financing platforms for demand-side management initiatives, such as ESCOs.

Assumptions: Assuming 25% of total energy efficiency savings from industry (2,500MW) and taking energy efficiency investment of INR10m per MW, we estimate investments of cINR25bn in the energy efficiency industry. On top of this, these savings will avoid the need for capital investment in new power generation capacity of INR105bn, besides reducing CO_2 emissions by around 14m tonnes per year. Furthermore, we assume that initiatives will continue in the XIIth plan with a target to save 3,000MW, thereby providing an investment opportunity of INR30bn and an additional emission saving potential of 17m tonnes by 2017, taking the total saving to 31m tonnes p.a. by 2017.

Industrial efficiency beneficiaries

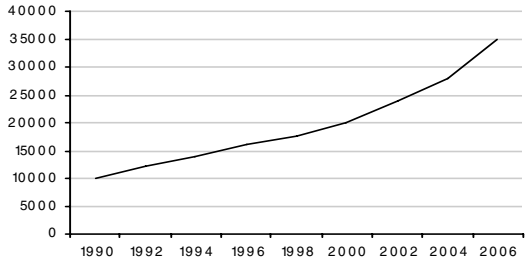
Key beneficiaries are set to include players such as ABB India, Alfa Laval India, Crompton Greaves, Triveni Engineering and Industries, and Thermax.

Theme 10: Buildings efficiency

The annual energy consumption of India's commercial buildings has been rising at a rapid rate.

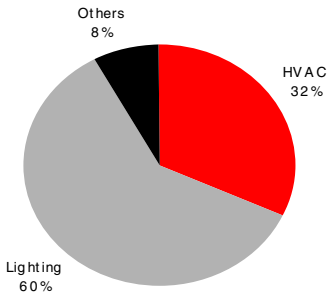
[19] *Building a low carbon Indian economy, CII, Jan 2008*
[20] *National action plan on Climate change, Govt of India, June 2008*

Annual electricity consumption in commercial sector in India (GWh)



Source: BEE

Energy consumption in commercial sector in India (2006)



Source: BEE

With the objective of controlling the rising trend of electricity consumption in the commercial sector, the government launched the Energy Conservation Building Code (ECBC) in 2007, which sets the minimum energy consumption standards for commercial buildings, based on climatic zones. The ECBC covers only new commercial buildings with a connected load of 500kW or contract demand of 600kVA and above.

According to the Ministry of Power, about 306 ECBC compliant buildings are being constructed currently, which will help save c30-40% more energy than conventional buildings. The government plans to make the ECBC mandatory in future by prescribing standards for:

- Building envelopes (walls, roofs, windows)
- Lighting (indoor and outdoor)
- Heating ventilation and air conditioning (HVAC) systems
- Solar water heating and pumping
- Electrical systems (power factor and transformers)

The following chart compares energy consumption across different segments in commercial buildings.

The National Mission on Sustainable Habitat incorporates goals for improving energy efficiency in the residential and commercial sectors. A cornerstone is the Bachat Lamp Yojna (BLY), programme launched in 2007 with the objective of replacing 400m incandescent bulbs with CFLs in two years. The BLY will deploy CDM revenues to subsidise the cost of CFLs at INR15 per lamp, compared with the current average market price of INR 80-100. The government estimates that replacing the lamps will result in a 6,000-10,000MW reduction in electricity demand, cutting CO_2 emissions by 24m tonnes[21] per year.

India's Bureau of Energy Efficiency (BEE) launched the star based labelling programme in 2006 for several appliances, including refrigerators, air conditioners, fluorescent tubular lamps and distribution transformers. Other appliances, including TVs and gas geysers, are next in line to be labelled. According to CII, this program will help to avoid 3000 MW[22] of new capacity by 2012.

In 2007, the market size of the CFL industry was INR11.6bn, based on a total demand for 165m CFL units, of which, 65m[23] were imported. The BLY scheme will create additional average demand of 400m in two years. Over FY2008-12, we estimate sales of 1430m units, including the

[21] *Action plan on energy efficiency, BEE, 2007*
[22] *Building a low carbon Indian economy, CII, Jan 2008*
[23] *Electric Lamp & component manufacturers association of India website www.elcomaindia.com as viewed on 15th Oct 2008*

400m units under the BLY scheme and another 1360m units in FY2013-17. Assuming a marginal decline in CFL price y-o-y from the current level of INR83/unit, we estimate an investment potential of INR110bn over FY2008-12 and INR90bn over FY 2013-17. We also estimate emission savings of 114m tonnes p.a. from FY2018 onwards.

Building efficiency beneficiaries

Companies with a high exposure to CFLs stand to gain, including Asian Electronics, Havells India, Phoenix Lamps, and Surya Roshni Ltd.

Theme 11: Power supply efficiency

The NAPCC calls for reductions in transmission and distribution (T&D) losses from 16-19% to 6-8% through the adoption of technologies such as High Voltage Alternating Current (HVAC) and High Voltage Direct Current (HVDC). We estimate that bringing T&D losses to international levels would enable India to save 70bn units of electricity annually, thereby reducing 57m tonne of CO_2 emissions.

The Government of India has set aside an investment of INR500bn[24] under the APDRP scheme for system development, strengthening and AT&C loss reduction during the XIth plan period. However, the slow progress made in the last five-year plan means that we assume the INR500bn will be spent over a 10-year period. The Re-Structured APDRP scheme during the XI Plan lays out eligibility criteria for the states/utilities to get the support under the program. One criterion requires utilities with AT&C losses above 30% to reduce these losses by 3% p.a; for utilities with losses below 30% the reduction benchmark is 1.5% p.a. On a conservative basis, we assume loss reduction of 1.5% p.a. and assume that only 50% of the savings will result in a reduction in electricity consumption, with the remaining 50% resulting in incremental revenues. Assuming generation growth of 7% p.a. over FY 2008-17e, we estimate CO_2 reduction potential of 58m tonne.

Power efficiency beneficiaries

A range of electrical equipment companies, primarily manufacturers of transformers, cables and switch gear, will benefit, including ABB India, BHEL (Overweight (V), target price INR1,750), Crompton Greaves, ICSA India Ltd and KLG Systel.

[24] *http://economictimes.indiatimes.com/News/Economy/Finance/Finance_Ministry_approves_new_Rs_50000_cr_APDRP_scheme/rssarticleshow/2935220.cms*

HSBC

Outlook

- The government's proposals now need to be implemented
- The National Missions are scheduled to report by December 2008
- The impending general election by May 2009 and the scheduled completion of global climate talks in December 2009 are the main risks to our growth scenario

The attractiveness of many of these climate change themes rests on the fact that there are multiple drivers behind their growth – not least, wider policies to promote energy efficiency, security and diversification. Nonetheless, to mobilise the full quantum of investment we have projected will require the finalisation and implementation of a number of key policy measures at the national and international levels.

National stepping stones

In the immediate future, investors should analyse the initial reports of the eight national missions which are due by December 2008. In terms of the climate investment themes that we have identified, investors need to monitor:

- Industrial Energy Efficiency and the progress that the mission has made in terms of designing a tradable certificate scheme.

- **Building Efficiency** and the latest indications in terms of the timeline for the shift from voluntary ECBC norms into mandatory standards.

More broadly, two further policy milestones are worth watching

- **Renewable energy**: We expect CERC to finalise new regulations for new Dynamic Renewable Portfolio standards before March 2009.

- Biofuels: We expect the 10% bio-ethanol blending target to be introduced in October 2009.

International stepping stones

A number of India's climate change investment themes are dependent on global climate mechanisms, notably the CFL replacement programme funded by the CDM, and the roll-out of solar thermal technology, where the NAPCC highlights the importance of technology transfer. In December 2008, global negotiators will meet in Poznan to take stock of progress to date on agreeing a new global climate change treaty to succeed the Kyoto Protocol. Critical factors for investors to watch include:

- Finance: In its submission to Poznan, the Government of India has called for 0.5% of developed world GDP to be deployed to finance a technology acquisition and transfer fund, as well as a venture capital fund for emerging technologies.

- **Carbon markets:** The future of India's current revenues via the CDM is dependent on a successful conclusion to the Copenhagen process. The NAPCC highlighted that the CDM had not yet led to much technology transfer. Investors should look both for signs of progress that industrialised nations are willing to take on ambitious carbon caps, along with indications that the CDM will be reformed to enable both greater volumes, as well as greater credibility.

HSBC

Company section

HSBC

BHEL

- Successful in supercritical segment with technology tie-ups with Siemens and Alstom
- Increasing share in advanced gas turbines with 2% global market share
- Rating Overweight (V); target price INR1,750

Snapshot

BHEL has been a key supplier of power equipment to the utilities, with a 65% market share of the total installed capacity in India. BHEL's presence in the manufacturing of supercritical thermal generating boilers and turbines (cleaner coal) and gas turbines makes it a beneficiary of clean climate initiatives.

Foray into supercritical: BHEL has entered into a collaboration with Siemens and Alstom for developing 800MW supercritical boilers and turbines. It has already received orders from NTPC and APGENCO to set up supercritical power projects.

Gas turbine manufacturing: BHEL manufactures advanced gas turbines, with a 2% global market share. In 1H2008, it had an 85% (vs. 18% in 1H07) market share in India.

Development of IGCC technology: BHEL also develops Integrated Gasification Combined Cycle (IGCC) technology. It has set up Asia's first 6.2 MW IGCC power plant with an indigenously designed pressurised fluidised bed gasifier. The company has also signed an MoU with APGENCO for setting up a 125 MW IGCC.

Solar Photovoltaic: It has commissioned six stand-alone Solar Photovoltaic power plants of 3x110 KWp and 3x55 KWp capacities in West Bengal.

Outlook: We think the outlook for BHEL remains strong due to 1) a strong order backlog of INR1trn, c4.8x trailing 12-month revenue; 2) strong new order pipeline; 3) risk to order cancellation not significant due to orders from large utilities and customer advances received against these orders; 4) favourable FX rate has reduced overseas competition; 5) capacity expansion to cater to growth; 6) cost pressure to reduce in FY10e, given lower commodity prices, as well as no wage provision; 7) new business segments, such as gas turbines, to add to growth; 8) JV with entities to explore opportunities in nuclear power plants, super critical thermal projects and locomotive business.

Valuation & risks

We have an Overweight (V) rating on the stock, with a target price of INR1,750 based on MACC valuation methodology. BHEL is currently trading at a discount to its global sector median MACC value, of 16.2%. We expect BHEL to trade at a 12.2%-16.2% MACC range, a 0-400bps premium to the 16.2% sector median MACC, and at a CROIC range of 9-10%, given its positive outlook, higher margin, and higher RoE. We have used the mid-point of this valuation range to derive our target price, of INR1750. Risks to our rating include rising interest rates, execution risks, a slowdown in power reforms, and shortages of manpower and raw materials.

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HSBC

Financials & valuation: BHEL

Overweight (V)

Financial statements

Year to	03/2007a	03/2008e	03/2009e	03/2010e
Profit & loss summary (INRm)				
Revenue	174,203	197,269	275,705	354,159
EBITDA	37,770	45,197	57,257	74,707
Depreciation & amortisation	-2,730	-2,972	-3,324	-4,284
Operating profit/EBIT	35,040	42,225	53,933	70,423
Net interest	4,035	9,871	8,681	12,115
PBT	37,359	44,304	62,615	82,538
HSBC PBT	37,359	44,304	62,615	82,538
Taxation	-13,214	-15,711	-20,976	-27,650
Net profit	24,146	28,594	41,639	54,888
HSBC net profit	25,861	36,385	41,639	54,888
Cash flow summary (INRm)				
Cash flow from operations	37,291	44,939	56,654	26,483
Capex	-3,974	-6,452	-8,670	-15,000
Cash flow from investment	-3,974	-6,452	-8,680	-15,010
Dividends	-6,925	-8,734	-12,600	-14,318
Change in net debt	-21,427	-25,724	-35,374	2,845
FCF equity	35,032	46,278	47,984	11,483
Balance sheet summary (INRm)				
Fixed assets	12,913	16,393	21,739	32,455
Current assets	210,618	277,047	360,410	424,898
Cash & others	58,077	83,860	118,482	115,637
Total assets	232,965	306,902	395,621	470,835
Operating liabilities	144,189	198,208	258,640	293,285
Gross debt	893	952	200	200
Net debt	-57,184	-82,908	-118,282	-115,437
Shareholders funds	87,883	107,742	136,781	177,350
Invested capital	21,265	11,372	5,026	48,431

Ratio, growth and per share analysis

Year to	03/2007a	03/2008e	03/2009e	03/2010e
Y-o-y % change				
Revenue	29.0	13.2	39.8	28.5
EBITDA	31.7	19.7	26.7	30.5
Operating profit	33.6	20.5	27.7	30.6
PBT	45.7	18.6	41.3	31.8
HSBC EPS	32.1	40.7	14.4	31.8
Ratios (%)				
Revenue/IC (x)	6.7	12.1	33.6	13.2
ROIC	87.6	167.0	437.4	175.2
ROE	32.1	37.2	34.1	34.9
ROA	11.8	10.7	11.9	12.7
EBITDA margin	21.7	22.9	20.8	21.1
Operating profit margin	20.1	21.4	19.6	19.9
EBITDA/net interest (x)				
Net debt/equity	-65.1	-77.0	-86.5	-65.1
Net debt/EBITDA (x)	-1.5	-1.8	-2.1	-1.5
CF from operations/net debt				
Per share data (INR)				
EPS Rep (fully diluted)	49.32	58.41	85.06	112.13
HSBC EPS (fully diluted)	52.83	74.33	85.06	112.13
DPS	12.25	15.25	22.00	25.00
Book value	179.53	220.10	279.42	362.29

Valuation data

Year to	03/2007a	03/2008e	03/2009e	03/2010e
EV/sales	3.3	2.8	1.9	1.5
EV/EBITDA	15.4	12.3	9.1	7.0
EV/IC	27.3	48.8	103.2	10.8
PE*	24.6	17.5	15.3	11.6
P/Book value	7.3	5.9	4.7	3.6
FCF yield (%)	5.5	7.3	7.5	1.8
Dividend yield (%)	0.9	1.2	1.7	1.9

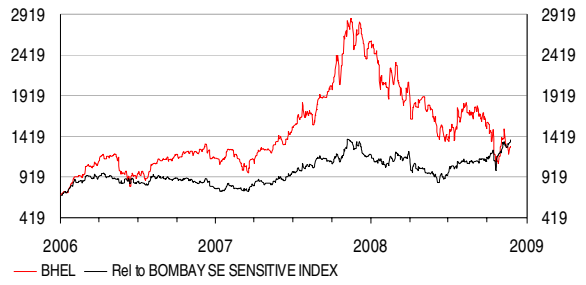
Note: * = Based on HSBC EPS (fully diluted)

Issuer information

Share price (INR)	1,302	Target price (INR)	1,750	Potent'l tot rtn (%)	34.4

Reuters (Equity)	BHEL.BO	Bloomberg (Equity)	BHEL IN
Market cap (USDm)	12,722	Market cap (INRm)	637,355
Free float (%)	32	Enterprise value (INRm)	554,364
Country	India	Sector	ELECTRICAL EQUIPMENT
Analyst	Sumeet Agrawal	Contact	91 22 2268 1243

Price relative



Source: HSBC

Note: price at close of 24 Nov 2008

HSBC

Larsen & Toubro

- Key beneficiary of infrastructure spending of USD570bn in India during the XI plan period (FY08-13)
- Vertical diversification into power, railways and shipbuilding, along with international business, to mitigate any near-term challenges
- Strong balance sheet and ability to manage interest expense make it preferred choice; OW (V) rating, target price INR1,250

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Snapshot

L&T is a diversified engineering and construction company with presence in various sectors: infrastructure (34%), process (17%), oil&gas (20%), and power (20%). L&T is diversifying into sectors such as power equipment manufacturing, railways, hydrocarbons, and shipbuilding to offset any near-term challenges in its existing business. The company has also increased its focus on international business (20% revenue in Q209) to offset any challenges in the domestic market. L&T's move into the manufacturing of supercritical thermal generating boilers and its presence in the nuclear generation equipment market makes it a beneficiary of clean climate investments.

Supercritical segment: L&T is building supercritical power equipment, manufacturing a plant in Hazira, (50:50 joint venture with Mitsubishi). The plant is expected to be operational in FY2011 and will have an initial capacity of c3.5GW. The company has already bagged a INR15.6bn order from APGenco for super critical turbines. The order inflow from the power business has increased from 10% in FY06 to 26% in 1H09, mainly on account of the new venture.

Nuclear: L&T manufactures reactor vessels for pressurised heavy water reactors and fast breeder reactors and critical equipment & systems for heavy water plants, fuel re-processing plants and plasma reactors. It also offers installation and construction services for new nuclear power plants. Though the revenue from this segment is not significant, the existing experience working with NPCL will allow the company to enter into technological tie-ups in the future nuclear power programme in India.

L&T's strong balance sheet and ability to raise funds overseas are key strengths.

Valuation & risks

We are Overweight (V) on the stock, with a target price of INR1,250, based on MACC methodology. We expect L&T to trade at a MACC of 12-14%, a 200-400bps premium to the 16.2% sector median MACC, and at a CROIC of 8.4-9.5%. We have used the mid-point of this valuation range to derive the core value of L&T, at INR987. Adding INR263 per share as the value of its other subsidiaries, we derive a target price of INR1,250. At our target price, L&T's core business would trade at 15.8x FY10e earnings. Execution delay is a key risk; any rise in interest rates will also impact profitability.

HSBC

Financials & valuation: Larsen & Toubro

Overweight (V)

Financial statements

Year to	03/2007a	03/2008e	03/2009e	03/2010e
Profit & loss summary (INRm)				
Revenue	174,996	247,865	323,625	426,577
EBITDA	16,673	27,464	36,360	49,224
Depreciation & amortisation	-1,700	-2,116	-2,857	-3,369
Operating profit/EBIT	14,973	25,348	33,503	45,855
Net interest	-339	-382	-593	-595
PBT	18,673	29,769	38,672	52,176
HSBC PBT	18,673	29,769	38,672	52,176
Taxation	-6,022	-9,821	-11,602	-15,653
Net profit	12,651	19,949	27,071	36,523
HSBC net profit	12,651	19,949	27,071	36,523
Cash flow summary (INRm)				
Cash flow from operations	19,762	20,017	23,581	35,010
Capex	-7,915	-16,344	-4,707	-7,500
Cash flow from investment	-15,583	-26,110	-17,207	-20,000
Dividends	-4,216	-5,716	-5,701	-7,692
Change in net debt	-2,818	-12,055	122	-7,319
FCF equity	8,178	-1,129	13,111	20,594
Balance sheet summary (INRm)				
Fixed assets	21,968	36,195	38,045	42,177
Current assets	135,161	207,897	233,717	294,552
Cash & others	27,259	54,376	52,254	58,323
Total assets	171,854	268,584	308,754	386,220
Operating liabilities	93,267	136,838	158,434	208,318
Gross debt	20,778	35,840	33,840	32,590
Net debt	-6,481	-18,536	-18,414	-25,733
Shareholders funds	57,405	95,293	115,866	144,699
Invested capital	36,603	52,878	61,075	70,088

Ratio, growth and per share analysis

Year to	03/2007a	03/2008e	03/2009e	03/2010e
Y-o-y % change				
Revenue	18.6	41.6	30.6	31.8
EBITDA	57.4	64.7	32.4	35.4
Operating profit	58.7	69.3	32.2	36.9
PBT	60.8	59.4	29.9	34.9
HSBC EPS	55.4	52.8	35.9	34.8
Ratios (%)				
Revenue/IC (x)	4.8	5.5	5.7	6.5
ROIC	27.9	38.0	41.2	48.9
ROE	24.5	26.1	25.6	28.0
ROA	8.8	9.4	10.2	11.2
EBITDA margin	9.5	11.1	11.2	11.5
Operating profit margin	8.6	10.2	10.4	10.7
EBITDA/net interest (x)	49.1	71.9	61.3	82.8
Net debt/equity	-11.3	-19.5	-15.9	-17.8
Net debt/EBITDA (x)	-0.4	-0.7	-0.5	-0.5
CF from operations/net debt				
Per share data (INR)				
EPS Rep (fully diluted)	22.67	34.66	46.34	62.54
HSBC EPS (fully diluted)	22.33	34.12	46.38	62.51
DPS	6.60	8.61	8.34	11.26
Book value	101.33	162.98	198.50	247.64

Valuation data

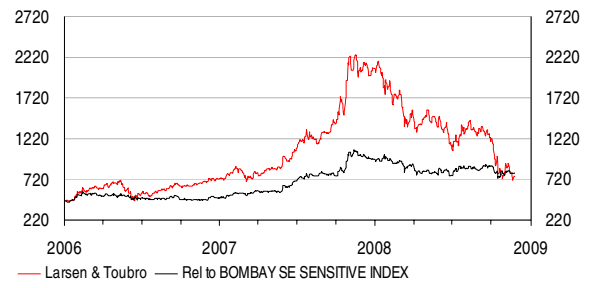
Year to	03/2007a	03/2008e	03/2009e	03/2010e
EV/sales	2.5	1.8	1.3	0.9
EV/EBITDA	26.6	15.9	11.6	8.2
EV/IC	12.1	8.3	6.9	5.7
PE*	34.0	22.2	16.4	12.1
P/Book value	7.5	4.7	3.8	3.1
FCF yield (%)	1.8	-0.2	3.0	4.8
Dividend yield (%)	0.9	1.1	1.1	1.5

Note: * = Based on HSBC EPS (fully diluted)

Issuer information

Share price (INR)	758.70	Target price (INR)	1250.00
Potent'l tot rtn (%)	64.8		
Reuters (Equity)	LART.BO	Bloomberg (Equity)	LT IN
Market cap (USDm)	8,864	Market cap (INRm)	444,065
Free float (%)	96	Enterprise value (INRm)	436878
Country	India	Sector	Construction & Engineering
Analyst	Sumeet Agrawal	Contact	91 22 2268 1243

Price relative



Source: HSBC

Note: price at close of 24 Nov 2008

HSBC

ONGC

- The bulk of ONGC's domestic gas production is priced at about USD2/MMBtu
- It is potentially a major beneficiary of any deregulation of Indian gas prices
- Rating Overweight; target price INR1,470

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Snapshot

ONGC could be the biggest beneficiary of any deregulation in natural gas prices in India. The case for deregulation could get further support with the start-up of 80MMcm/d production from 'KG-D6 block' gas fields. This is likely to significantly increase the proportion of gas being sold at market determined prices, resulting in the acceptance of higher prices by various classes of consumers and increasing disparities across different producers.

ONGC had total domestic proven and probable reserves of 6.4bn bbls as of end FY2007, with natural gas forming 43% of the total. Currently, ONGC is selling the bulk of its domestic gas production at about USD2/MMBtu, much lower than prevailing prices realised by private producers. To highlight the potential benefit of deregulation, each USD1/MMBtu move in our Indian gas price assumption changes our target price by around 6%, or INR88/share.

Valuation and risks

Our valuation of ONGC's core reserves is based on a DCF valuation of its proven and probable oil and gas reserves and development upside from ONGC's KG basin assets and the Rajasthan fields, where it owns a 30% stake. The DCF analysis is based on a discount rate of 13.5%, assuming the oil and gas reserves are depleted over 20-25 years.

We have included development upside from ONGC's KG basin assets and the Rajasthan fields, where it owns 30%.

Valuation of ONGC

	Valuation (INR/share)
Core reserves	
Proven reserves	1,097
Probable reserves	152
Development upside	
KG gas	61
Contingent resources	6
Investments	61
Net cash	91
	1,470

Source: HSBC

The risks to our rating include materially lower long-term oil and gas prices than our assumptions. Company-specific risks include an increase in the share of subsidy-sharing mechanism, royalty and cess (tax) charges. A poor exploration programme or underperforming field production could also be a risk to our rating.

HSBC

Financials & valuation: Oil & Natural Gas Corp.

Overweight

Financial statements

Year to	03/2007a	03/2008e	03/2009e	03/2010e
Profit & loss summary (INRm)				
Revenue	822,615	967,822	1,418,535	1,145,980
EBITDA	346,893	404,660	513,550	414,015
Depreciation & amortisation	-119,678	-138,878	-118,234	-123,563
Operating profit/EBIT	227,215	265,782	395,315	290,452
Net interest	1,058	-2,153	-3,997	-4,034
PBT	277,472	309,211	421,768	318,368
HSBC PBT	277,472	309,211	421,768	318,368
Taxation	-98,454	-106,999	-150,437	-113,753
Net profit	177,594	198,703	267,258	201,454
HSBC net profit	177,594	198,703	267,258	201,454
Cash flow summary (INRm)				
Cash flow from operations	373,871	337,227	344,529	366,808
Capex	-199,026	-192,382	-326,187	-163,400
Cash flow from investment	-212,793	-196,532	-287,362	-157,880
Dividends	66,305	68,444	57,749	59,888
Change in net debt	-111,268	-42,432	84,190	-125,734
FCF equity	117,642	98,334	-15,108	171,458
Balance sheet summary (INRm)				
Fixed assets	647,399	700,903	908,855	948,692
Current assets	388,405	475,345	565,809	617,730
Cash & others	150,653	186,525	213,179	344,913
Total assets	1,102,252	1,246,846	1,506,439	1,592,676
Operating liabilities	182,956	235,126	226,454	185,269
Gross debt	16,005	9,445	120,288	126,288
Net debt	-134,648	-177,080	-92,891	-218,625
Shareholders funds	667,136	780,866	912,836	1,026,922
Invested capital	702,194	754,596	1,035,032	1,036,239

Ratio, growth and per share analysis

Year to	03/2007a	03/2008e	03/2009e	03/2010e
Y-o-y % change				
Revenue	5.7	17.7	46.6	-19.2
EBITDA	13.4	16.7	26.9	-19.4
Operating profit	6.1	17.0	48.7	-26.5
PBT	15.7	11.4	36.4	-24.5
HSBC EPS	-7.7	-6.8	34.5	-24.6
Ratios (%)				
Revenue/IC (x)	1.2	1.3	1.6	1.1
ROIC	21.0	23.9	28.4	18.0
ROE	28.8	27.4	31.6	20.8
ROA	17.6	17.3	19.9	13.4
EBITDA margin	42.2	41.8	36.2	36.1
Operating profit margin	27.6	27.5	27.9	25.3
EBITDA/net interest (x)		188.0	128.5	102.6
Net debt/equity	-20.2	-22.7	-10.2	-21.3
Net debt/EBITDA (x)	-0.4	-0.4	-0.2	-0.5
CF from operations/net debt				
Per share data (INR)				
EPS Rep (fully diluted)	124.55	139.35	187.43	141.28
HSBC EPS (fully diluted)	99.64	92.90	124.95	94.19
DPS	-37.20	-32.00	-27.00	-28.00
Book value	374.29	365.08	426.78	480.12

Valuation data

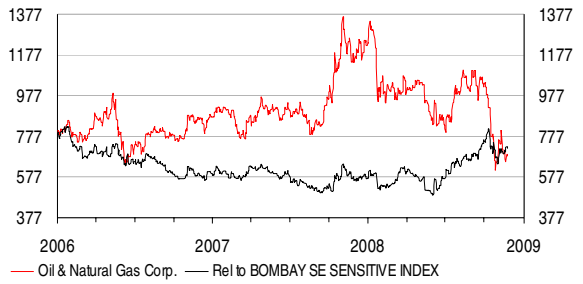
Year to	03/2007a	03/2008e	03/2009e	03/2010e
EV/sales	1.5	1.2	0.9	1.1
EV/EBITDA	3.6	3.0	2.6	2.9
EV/IC	1.8	1.6	1.3	1.2
PE*	6.8	7.3	5.4	7.2
P/Book value	1.8	1.9	1.6	1.4
FCF yield (%)	8.5	7.1	-1.1	12.0
Dividend yield (%)	-5.5	-4.7	-4.0	-4.1

Note: * = Based on HSBC EPS (fully diluted)

Issuer information

Share price (INR)	678.50	Target price (INR)	1,470
Potent'l tot rtn (%)	116.7		
Reuters (Equity)	ONGC.BO	Bloomberg (Equity)	ONGC IN
Market cap (USDm)	28,967	Market cap (INRm)	1,451,225
Free float (%)	26	Enterprise value (INRm)	1203546
Country	India	Sector	OIL & GAS
Analyst	Kirtan Mehta	Contact	+91 80 30013779

Price relative



Source: HSBC

Note: price at close of 24 Nov 2008

HSBC

PSL Ltd

- PSL manufactures and supplies line pipes for oil and gas companies
- INR60bn order backlog, with orders from GAIL and Florida Gas Transmission Company
- We have an Overweight (V) rating with a target price of INR170

Snapshot

PSL Limited is the largest Indian spiral pipe company in terms of capacity, and manufactures and supplies spiral weld pipes for oil, gas and water transmission.

The company has a total capacity of 1,175,000 tonnes for producing line pipes and plans to set up a new 350,000 tonnes manufacturing facility in the US.

We believe that the company would benefit from an increase in natural gas demand (due to fuel switch) since this would increase the requirement for infrastructure for the transportation and distribution of gas.

Gas transportation infrastructure: PSL has an order backlog of INR60bn, which includes orders from GAIL and Florida Gas Transmission Company for laying the infrastructure for gas distribution.

It has earlier successfully executed pipeline projects for BPCL, IOCL and Reliance Industries Ltd in the domestic market.

Valuation & risks

We value PSL Ltd using a PE multiple based valuation methodology.

Our target PE multiple for PSL Ltd is 5x and based on our September 09 EPS estimate, we arrive at fair value of INR170.

We have an Overweight (V) rating based on the fact that that the company has a strong order book and we expect the execution to improve in the second half of the year, with the company's US production facility coming on stream.

Risks

The key risks to our rating are: 1) slower execution of order backlog and depletion of order backlog, 2) lower than expected EBITDA margin, and 3) equity dilution, leading to lower than expected EPS.

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HSBC

Financials & valuation: PSL Ltd

Overweight (V)

Financial statements

Year to	03/2008a	03/2009e	03/2010e	03/2011e
Profit & loss summary (INRm)				
Revenue	20,734	37,960	42,983	43,896
EBITDA	1,923	3,332	4,016	4,224
Depreciation & amortisation	-539	-586	-607	-662
Operating profit/EBIT	1,383	2,745	3,409	3,562
Net interest	-579	-958	-1,103	-1,255
PBT	1,253	1,937	2,456	2,457
HSBC PBT	1,253	1,937	2,456	2,457
Taxation	-409	-639	-810	-811
Net profit	844	1,298	1,646	1,646
HSBC net profit	844	1,298	1,646	1,646
Cash flow summary (INRm)				
Cash flow from operations	30	-2,396	1,476	4,164
Capex	-1,799	-250	-250	-750
Cash flow from investment	-1,799	-250	-250	-750
Dividends	-121	-236	-260	-260
Change in net debt	-123	2,882	-967	-3,155
FCF equity	-806	-2,796	1,076	3,264
Balance sheet summary (INRm)				
Fixed assets	6,391	6,055	5,698	5,786
Current assets	16,971	25,155	28,834	30,578
Cash & others	4,005	1,623	3,090	6,745
Total assets	23,572	31,420	34,741	36,574
Operating liabilities	7,686	13,860	15,272	15,218
Gross debt	9,317	9,817	10,317	10,817
Net debt	5,312	8,193	7,227	4,072
Shareholders funds	5,697	6,759	8,145	9,531
Invested capital	11,671	15,726	16,169	14,401

Ratio, growth and per share analysis

Year to	03/2008a	03/2009e	03/2010e	03/2011e
Y-o-y % change				
Revenue	43.7	83.1	13.2	2.1
EBITDA	27.0	73.3	20.5	5.2
Operating profit	28.8	98.5	24.2	4.5
PBT	37.1	54.6	26.8	0.1
HSBC EPS	28.2	53.8	26.8	0.1
Ratios (%)				
Revenue/IC (x)	2.0	2.8	2.7	2.9
ROIC	8.8	13.4	14.3	15.6
ROE	18.3	20.8	22.1	18.6
ROA	6.2	7.1	7.2	7.0
EBITDA margin	9.3	8.8	9.3	9.6
Operating profit margin	6.7	7.2	7.9	8.1
EBITDA/net interest (x)	3.3	3.5	3.6	3.4
Net debt/equity	90.4	118.1	86.8	41.9
Net debt/EBITDA (x)	2.8	2.5	1.8	1.0
CF from operations/net debt	0.6		20.4	102.3
Per share data (INR)				
EPS Rep (fully diluted)	20.39	31.35	39.75	39.77
HSBC EPS (fully diluted)	20.39	31.35	39.75	39.77
DPS	3.78	5.00	5.50	5.50
Book value	177.46	163.25	196.73	230.23

Valuation data

Year to	03/2008a	03/2009e	03/2010e	03/2011e
EV/sales	0.4	0.3	0.3	0.2
EV/EBITDA	4.7	3.6	2.7	1.9
EV/IC	0.8	0.8	0.7	0.5
PE*	4.4	2.9	2.3	2.3
P/Book value	0.5	0.5	0.5	0.4
FCF yield (%)	-21.3	-74.0	28.5	86.4
Dividend yield (%)	4.2	5.6	6.1	6.1

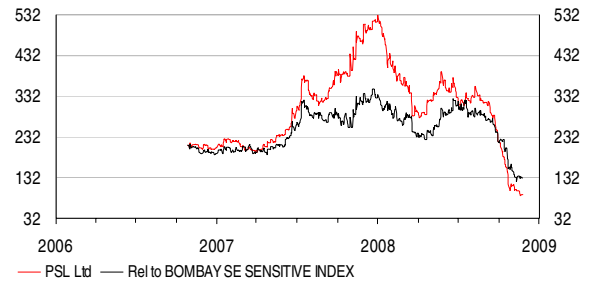
Note: * = Based on HSBC EPS (fully diluted)

Issuer information

Share price (INR)	89.50	Target price (INR)	170
Potent'l tot rtn (%)	89.9		

Reuters (Equity)	PSLH.BO	Bloomberg (Equity)	PSLL IN
Market cap (USDm)	76	Market cap (INRm)	3,823
Free float (%)	40	Enterprise value (INRm)	11973
Country	India	Sector	ENERGY EQUIPMENT
Analyst	Sandeep Somani	Contact	+9122 2268 1245

Price relative



Source: HSBC

Note: price at close of 24 Nov 2008

HSBC

Reliance Industries (RIL)

- RIL is likely to emerge as one of the largest domestic producers of gas in India
- RIL's significantly large exploration portfolio provides it an opportunity to benefit from growth in demand for natural gas
- Rating Overweight; target price INR2,160

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Snapshot

RIL is poised to become the largest domestic producer of natural gas in India with the start-up of natural gas production from its D6 field on the eastern coast of India by Q4 FY2009. As per guidance, Reliance plans to start gas production in the KG D6 gas project over 2H FY 2009 and to ramp-up to peak production of 80MMcm/d within six quarters. Currently the natural gas produced from this field is set to be sold at USD4.2/MMBtu (USD25/bbloe), following a decision by the Indian government. However, a court ruling is pending. Further, RIL's exploration portfolio provides it an opportunity to benefit from any growth in gas demand in India, and given the increasing emphasis on NG based generation facilities, we see RIL as a beneficiary of clean energy initiatives.

Valuation and risks

Our target price is based on a sum-of-the-parts valuation of RIL's core business. Our valuation per share for RIL is based on its current outstanding shares, less treasury shares. To account for the recent de-rating of the market, we change our valuation methodology for the petrochemical and refining business to a combination of DCF-based valuation (50%) and relative valuation (50%) based on a EV/EBITDA multiple of 5.5x. Our DCF valuation for parts of the business is based on a WACC of 11.2%. We value RIL's investments in RPL at our target price of INR165/share

RIL: Sum-of-the-parts valuation

Business	Method	Valuation (INR/share)
Petrochem and refining	Combination of DCF and relative multiple	**1030**
E&P		**692**
PMT block	DCF	68
D6 MA crude	DCF	57
D6 MA gas	At D6 gas valuation	36
D6 gas	DCF	403
CBM	At USD3.0/boe	40
NEC	At USD2.5/boe	87
Retail	DCF	**56**
Investments in RPL, RILL	Target price/ market value	**382**
Total		**2160**

Source: HSBC

The risks to our rating include materially lower long-term oil and gas prices; refining and petrochemical margins; and US dollar exchange rates than that in our assumptions. Company-specific risks include the recoverability of reserves, project ramp-up of oil and gas production and refinery production, and litigation over gas pricing (KG D6) in the Mumbai high court.

HSBC

Financials & valuation: Reliance Industries

Overweight (V)

Financial statements

Year to	03/2008a	03/2009e	03/2010e	03/2011e
Profit & loss summary (INRm)				
Revenue	1,371,467	1,985,084	2,261,035	2,085,854
EBITDA	231,446	282,591	414,110	443,265
Depreciation & amortisation	-50,042	-55,115	-76,530	-83,808
Operating profit/EBIT	181,404	227,477	337,581	359,457
Net interest	-10,865	-20,850	-20,381	-10,807
PBT	230,108	213,304	328,670	363,476
HSBC PBT	230,108	213,304	328,670	363,476
Taxation	-34,876	-35,191	-40,489	-46,731
Net profit	195,214	173,877	261,254	291,479
HSBC net profit	147,879	173,877	261,254	291,479
Cash flow summary (INRm)				
Cash flow from operations	302,054	142,871	318,506	385,072
Capex	-394,019	-119,534	-78,387	-207,670
Cash flow from investment	-413,652	-118,890	-78,387	-207,670
Dividends	-21,300	-23,618	-29,068	-32,702
Change in net debt	232,606	-205,470	-217,459	-145,344
FCF equity	-151,535	16,658	228,648	162,577
Balance sheet summary (INRm)				
Fixed assets	1,139,452	1,203,872	1,205,729	1,329,592
Current assets	514,889	566,624	632,133	676,049
Cash & others	44,742	126,853	144,543	202,060
Total assets	1,749,569	1,865,081	1,932,447	2,100,225
Operating liabilities	250,217	280,902	269,542	244,723
Gross debt	506,961	383,602	183,834	96,006
Net debt	462,219	256,749	39,290	-106,054
Shareholders funds	855,107	978,794	1,192,936	1,434,783
Invested capital	1,359,382	1,362,742	1,423,778	1,558,858

Ratio, growth and per share analysis

Year to	03/2008a	03/2009e	03/2010e	03/2011e
Y-o-y % change				
Revenue	20.5	44.7	13.9	-7.7
EBITDA	15.0	22.1	46.5	7.0
Operating profit	19.1	25.4	48.4	6.5
PBT	57.1	-7.3	54.1	10.6
HSBC EPS	19.9	12.9	44.5	11.6
Ratios (%)				
Revenue/IC (x)	1.2	1.5	1.6	1.4
ROIC	13.3	14.0	21.2	21.0
ROE	20.1	19.0	24.1	22.2
ROA	13.7	10.8	16.1	16.2
EBITDA margin	16.9	14.2	18.3	21.3
Operating profit margin	13.2	11.5	14.9	17.2
EBITDA/net interest (x)	21.3	13.6	20.3	41.0
Net debt/equity	51.6	23.7	3.0	-6.7
Net debt/EBITDA (x)	2.0	0.9	0.1	-0.2
CF from operations/net debt	65.3	55.6	810.6	
Per share data (INR)				
EPS Rep (fully diluted)	124.05	110.49	166.02	185.22
HSBC EPS (fully diluted)	101.73	114.87	166.02	185.22
DPS	12.69	13.52	16.00	0.00
Book value	588.25	621.99	758.07	911.76

Valuation data

Year to	03/2008a	03/2009e	03/2010e	03/2011e
EV/sales	1.6	1.0	0.8	0.8
EV/EBITDA	9.4	6.9	4.2	3.6
EV/IC	1.6	1.4	1.2	1.0
PE*	11.3	10.0	6.9	6.2
P/Book value	1.9	1.8	1.5	1.3
FCF yield (%)	-8.9	1.0	13.4	9.5
Dividend yield (%)	1.1	1.2	1.4	0.0

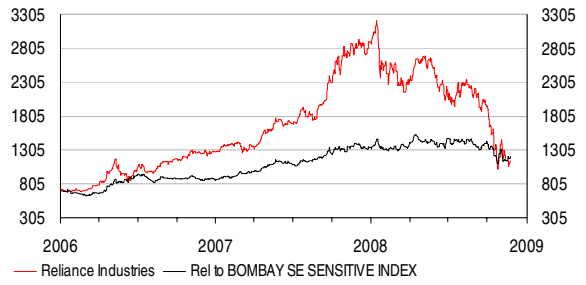
Note: * = Based on HSBC EPS (fully diluted)

Issuer information

Share price (INR)	1144.8	Target price (INR)	2160	Potent'l tot rtn (%)	88.7

Reuters (Equity)	RELI.BO	Bloomberg (Equity)	RIL IN
Market cap (USDm)	35,962	Market cap (INRm)	1,801,672
Free float (%)	53	Enterprise value (INRm)	1963836
Country	India	Sector	OIL & GAS
Analyst	Kirtan Mehta	Contact	+91 80 30013779

Price relative



Source: HSBC

Note: price at close of 24 Nov 2008

HSBC

Shree Renuka Sugars

- Its focus on renewable businesses – ethanol and cogeneration – diversifies earnings from the cyclical sugar business
- Margin expansion should lead to EPS CAGR of 91% for FY08-10e, improving ROE (30%) and ROIC (25%)
- We have an Overweight (V) rating, with a target price of INR80; trigger: inorganic growth; key risk: low ethanol and power sales

Snapshot

Shree Renuka Sugars is the largest ethanol manufacturing company in terms of production capacity and distinguishes itself from peers in terms of the business segments in which it operates and the sugar business operating model. The company will be a primary beneficiary of ethanol blending being made mandatory.

Apart from the manufacturing business, the company also refines and trades in sugar. It has a sugar manufacturing capacity of 37,500 tonnes crushed per day and a refining capacity of 4,000 tonnes per day. The total distillery capacity of the company would be 1,200 kilo litres per day (KLPD), and its cogeneration capacity is 143MW.

The company has focussed on developing its distillery business by investment in Dhanuka Petrochem (Distillery capacity) and KBK Chemicals (Ethanol manufacturing technology).

Bio fuel and ethanol: Of the total distillery capacity of 1,200 KLPD, the company has an ability to switch between sugarcane and molasses as the feed stock for 600 KLPD. The distillery division at the current ethanol price of INR21.5/litre would contribute c42% to the total earnings of the company. We estimate that an INR1/litre increase/decrease in price for the distillery segment would lead to a 3% increase/decrease in EPS.

Valuation & risks

The stock has been trading within a PB multiple band of 3-8x, since assets employed by the company are low as a result of its operating lease business model. We assign a PB multiple of 3x, and based on our FY09e BVPS, of INR29, we arrive at a fair value of INR85.

We have assumed a target EV/EBITDA multiple of 8x, and based on our FY09e EBITDA, of INR3.5bn, we arrive at a fair value of INR75. Our target price, of INR80, is the mid-point of our P/B and EV/EBITDA based valuations.

Risks: The key risks to our rating are: 1) lower availability of sugarcane, 2) higher sugarcane cost, 3) lower sugar prices, 4) increase in molasses cost, 5) equity dilution, and 6) cogeneration business realisation.

EV/EBITDA calculation

Heads	INR
Multiple	8.0
FY09e EBITDA	3,578
EV	28,623
Net Debt	5,971
Equity value	22,651
No. of shares	298
Fair value	75.0

Source: HSBC estimates

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HSBC

Financials & valuation: Shree Renuka Sugars

Overweight (V)

Financial statements

Year to	09/2007a	09/2008e	09/2009e	09/2010e
Profit & loss summary (INRm)				
Revenue	9,506	18,329	23,388	31,755
EBITDA	1,321	2,329	3,578	5,708
Depreciation & amortisation	-249	-420	-602	-692
Operating profit/EBIT	1,072	1,910	2,976	5,016
Net interest	-134	-647	-855	-918
PBT	1,067	1,263	2,121	4,098
HSBC PBT	1,067	1,263	2,121	4,098
Taxation	-236	-417	-530	-1,024
Net profit	831	846	1,590	3,074
HSBC net profit	831	846	1,590	3,074
Cash flow summary (INRm)				
Cash flow from operations	825	1,674	2,875	6,223
Capex	-3,408	-2,550	-2,600	-3,800
Cash flow from investment	-3,549	-2,550	-2,600	-3,800
Dividends	-83	-58	-66	-105
Change in net debt	2,624	-602	410	-3,252
FCF equity	-3,101	-1,523	-580	1,506
Balance sheet summary (INRm)				
Fixed assets	7,700	9,831	11,829	14,937
Current assets	3,352	4,698	5,631	8,708
Cash & others	307	909	1,149	4,401
Total assets	11,241	14,718	17,648	23,834
Operating liabilities	822	1,320	1,801	3,131
Gross debt	6,470	6,470	7,120	7,120
Net debt	6,163	5,561	5,971	2,719
Shareholders funds	3,357	6,329	8,089	12,909
Invested capital	9,924	12,300	14,510	16,113

Ratio, growth and per share analysis

Year to	09/2007a	09/2008e	09/2009e	09/2010e
Y-o-y % change				
Revenue	-13.9	92.8	27.6	35.8
EBITDA	-17.4	76.4	53.6	59.5
Operating profit	-29.1	78.2	55.8	68.6
PBT	-23.1	18.4	67.9	93.2
HSBC EPS	-33.8	-15.3	88.0	93.3
Ratios (%)				
Revenue/IC (x)	1.2	1.6	1.7	2.1
ROIC	10.4	11.5	16.6	24.6
ROE	29.8	17.5	22.1	29.3
ROA	10.1	9.9	13.8	18.1
EBITDA margin	13.9	12.7	15.3	18.0
Operating profit margin	11.3	10.4	12.7	15.8
EBITDA/net interest (x)	9.9	3.6	4.2	6.2
Net debt/equity	183.6	87.9	73.8	21.1
Net debt/EBITDA (x)	4.7	2.4	1.7	0.5
CF from operations/net debt	13.4	30.1	48.1	228.9
Per share data (INR)				
EPS Rep (fully diluted)	3.35	2.84	5.34	10.32
HSBC EPS (fully diluted)	3.35	2.84	5.34	10.32
DPS	0.34	0.21	0.23	0.35
Book value	13.53	22.93	28.89	43.33

Valuation data

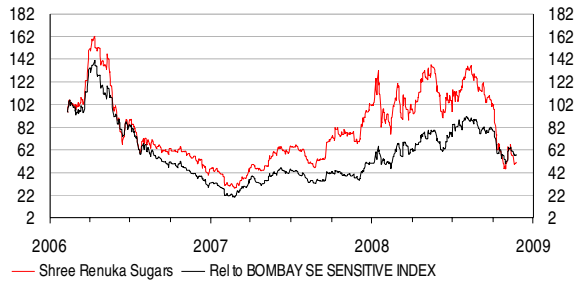
Year to	09/2007a	09/2008e	09/2009e	09/2010e
EV/sales	2.1	1.0	0.8	0.5
EV/EBITDA	15.0	8.2	5.5	2.9
EV/IC	2.0	1.6	1.4	1.0
PE*	15.3	18.0	9.6	5.0
P/Book value	3.8	2.2	1.8	1.2
FCF yield (%)	-22.7	-11.2	-4.2	11.0
Dividend yield (%)	0.7	0.4	0.5	0.7

Note: * = Based on HSBC EPS (fully diluted)

Issuer information

Share price (INR)	51.20	Target price (INR)	80.00
Potent'l tot rtn (%)	56.2		
Reuters (Equity)	SRES.BO	Bloomberg (Equity)	SHRS IN
Market cap (USDm)	276	Market cap (INRm)	13,822
Free float (%)	62	Enterprise value (INRm)	19216
Country	India	Sector	FOOD & STAPLES RETAILING
Analyst	Sandeep Somani	Contact	+9122 2268 1245

Price relative



Source: HSBC

Note: price at close of 24 Nov 2008

HSBC

Welspun Gujarat

- Welspun manufactures line pipes and also has backward integrated into steel plates/coil
- Strong order backlog of INR90bn from Trans Canada/ El Paso and Stroh Gas
- We have an Overweight (V) rating and a target price of INR160

Snapshot

Welspun is one of the largest pipe manufacturing companies, with a capacity of 350,000 tonnes per annum (TPA) for LSAW, 750,000 TPA for HSAW and 250,000 for ERW pipes. Besides this, the company has backward integrated into the manufacturing of steel plate and coil, with an annual production capacity of 1.5m tonnes.

Welspun is a supplier of pipes for over 50 oil and gas companies across the world. With the increase in the demand for natural gas as fuel, the company should benefit from the increase in the infrastructure requirement, as more pipeline projects are announced.

Gas transportation infrastructure The company has already executed international gas transmission pipeline projects in Alaska and Trans Canada. Based on its successful project execution, the company has received repeat orders from TransCanada, El Paso and Stroh Gas. The company's order book is INR90bn, with the majority of orders being for SAW pipes.

Valuation & Risks

We have valued Welspun Gujarat using PE multiple based valuations. Our target PE multiple for the stock is 6x, based on its historical PE band and its future outlook. Using our September 2009 EPS estimate, our PE multiple-based value is INR160 per share.

We have an Overweight (V) rating on the stock, based on its strong order backlog, of INR 90bn, higher than backlogs at peers Jindal SAW and PSL ltd, its healthy RoE (25%) & RoIC (16%) and the fact that the stock is currently trading at a trough PE multiple.

Risks: The key risks to our rating are: 1) lower sales due to lower-than-expected volumes and/or prices, 2) an increase in interest cost, and 3) a delay in capacity expansion and the commissioning of the plate mill.

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HSBC

Financials & valuation: Welspun Gujarat Stahl Roh

Overweight (V)

Financial statements

Year to	03/2008a	03/2009e	03/2010e	03/2011e
Profit & loss summary (INRm)				
Revenue	39,944	64,446	76,517	88,509
EBITDA	6,477	9,252	12,700	13,881
Depreciation & amortisation	-609	-1,580	-1,820	-1,940
Operating profit/EBIT	5,868	7,672	10,880	11,940
Net interest	-819	-1,754	-2,160	-1,820
PBT	5,235	5,918	8,719	10,121
HSBC PBT	5,235	5,918	8,719	10,121
Taxation	-1,828	-2,067	-3,045	-3,535
Net profit	3,407	3,851	5,674	6,586
HSBC net profit	3,407	3,851	5,674	6,586
Cash flow summary (INRm)				
Cash flow from operations	-19	14,297	8,402	9,663
Capex	-12,229	-4,000	-2,000	-2,000
Cash flow from investment	-12,229	-4,000	-2,000	-2,000
Dividends	-188	-356	-191	-212
Change in net debt	23,384	-20,573	-4,051	-5,631
FCF equity	-12,660	8,543	4,242	5,843
Balance sheet summary (INRm)				
Fixed assets	26,727	29,227	29,407	29,466
Current assets	12,251	36,865	46,041	57,210
Cash & others	-9,683	10,891	14,941	20,572
Total assets	39,233	72,909	82,264	93,493
Operating liabilities	15,147	26,127	29,999	34,854
Gross debt	25,274	25,274	25,274	25,274
Net debt	34,957	14,384	10,333	4,702
Shareholders funds	12,602	18,281	23,764	30,138
Invested capital	33,513	29,074	30,507	31,250

Ratio, growth and per share analysis

Year to	03/2008a	03/2009e	03/2010e	03/2011e
Y-o-y % change				
Revenue	49.1	61.3	18.7	15.7
EBITDA	94.4	42.8	37.3	9.3
Operating profit	105.4	30.7	41.8	9.7
PBT	138.9	13.0	47.3	16.1
HSBC EPS	111.4	30.0	28.1	16.1
Ratios (%)				
Revenue/IC (x)	1.5	2.1	2.6	2.9
ROIC	14.5	16.0	23.8	25.2
ROE	35.7	24.9	27.0	24.4
ROA	10.9	8.9	9.1	8.8
EBITDA margin	16.2	14.4	16.6	15.7
Operating profit margin	14.7	11.9	14.2	13.5
EBITDA/net interest (x)	7.9	5.3	5.9	7.6
Net debt/equity	277.4	78.7	43.5	15.6
Net debt/EBITDA (x)	5.4	1.6	0.8	0.3
CF from operations/net debt		99.4	81.3	205.5
Per share data (INR)				
EPS Rep (fully diluted)	18.32	20.70	30.51	35.41
HSBC EPS (fully diluted)	18.32	23.81	30.51	35.41
DPS	1.01	1.91	1.03	1.14
Book value	67.75	98.28	127.76	162.03

Valuation data

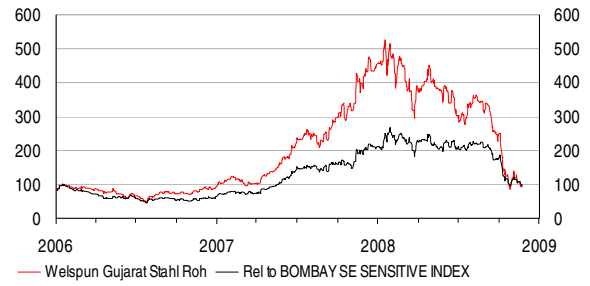
Year to	03/2008a	03/2009e	03/2010e	03/2011e
EV/sales	1.3	0.4	0.3	0.2
EV/EBITDA	8.0	2.7	1.6	1.1
EV/IC	1.6	0.9	0.7	0.5
PE*	5.1	3.9	3.1	2.6
P/Book value	1.4	0.9	0.7	0.6
FCF yield (%)	-73.9	80.8	40.1	55.3
Dividend yield (%)	1.1	2.1	1.1	1.2

Note: * = Based on HSBC EPS (fully diluted)

Issuer information

Share price (INR)	93.25	Target price (INR)	160
Potent'l tot rtn (%)	71.6		
Reuters (Equity)	WGSR.BO	Bloomberg (Equity)	WGS IN
Market cap (USDm)	347	Market cap (INRm)	17,390
Free float (%)	58	Enterprise value (INRm)	24957
Country	India	Sector	ENERGY EQUIPMENT
Analyst	Sandeep Somani	Contact	+9122 2268 1245

Price relative



Source: HSBC

Note: price at close of 24 Nov 2008

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Rating definitions for long-term investment opportunities

Stock ratings

HSBC assigns ratings to its stocks in this sector on the following basis:

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Our ratings are re-calibrated against these bands at the time of any 'material change' (initiation of coverage, change of volatility status or change in price target). Notwithstanding this, and although ratings are subject to ongoing management review, expected returns will be permitted to move outside the bands as a result of normal share price fluctuations without necessarily triggering a rating change.

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Prior to 15 November 2004, HSBC's ratings system was based upon a two-stage recommendation structure: a combination of the analysts' view on the stock relative to its sector and the sector call relative to the market, together giving a view on the stock relative to the market. The sector call was the responsibility of the strategy team, set in co-operation with the analysts. For other companies, HSBC showed a recommendation relative to the market. The performance horizon was 6-12 months. The target price was the level the stock should have traded at if the market accepted the analysts' view of the stock.

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LARSEN & TOUBRO	LART.BO	736.80	25-Nov-2008	2, 5, 6, 7
OIL & NATURAL GAS CORP	ONGC.BO	685.85	25-Nov-2008	6, 7
PSL LTD	PSLH.BO	88.75	25-Nov-2008	4
RELIANCE INDUSTRIES	RELI.BO	1071.80	25-Nov-2008	2, 5, 6, 9, 11
SHREE RENUKA SUGARS	SRES.BO	49.10	25-Nov-2008	6, 7
WELSPUN GUJARAT STAHL ROH	WGSR.BO	88.75	25-Nov-2008	4

Source: HSBC

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