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Power players: private sector key to India's US\$100bn programme to ramp up power capacity

Business impact

- India: substantial additional electricity generation capacity required (78,000 MW by 2012; approximately 100,000 MW between 2013 and 2018).
- Urgent need for investment to reduce power supply deficit: currently estimated at US\$100bn.
- Very significant opportunities for private sector investment.

Against a backdrop of ever-growing demand and increasing supply deficit, India's Ministry of Power has set a challenging goal of "power for all" by 2012¹. The provision of adequate, reliable power at an affordable cost to all Indian citizens is estimated to require a capacity augmentation programme of approximately 78,000 MW in the period to 2012. Due to the highly capital-intensive nature of the power sector, funding for this additional capacity is put at approximately US\$100bn. Although the industry is currently dominated by the public sector, India's ambitious capacity addition programme provides the private sector with significant opportunities for investment.

For the year to January 2008, the shortfall in India's energy capacity amounted to 9 per cent while its peak demand shortage was 15.2 per cent (or approximately 16,000 MW). The sector has, however, been slow to attract private sector investment on the scale that is needed. India's power sector was among the first in the world to be opened up to private participation under its New Economic Policy in 1991. It was also the first sector in which 100 per cent foreign direct investment was permitted, in an attempt to attract foreign capital and technology. However, during the 1990s private investors, both domestic and (particularly) foreign, struggled to make successful

investments and the sector became tainted with unsuccessful mega-projects such as Dabhol and Vizag.

The situation has, however, changed significantly in recent years.

This briefing sets out India's progress to date in respect of its policy objectives, and looks at some of the opportunities afforded by India's demand growth and sector reforms.

The legislative framework

For a variety of reasons, not least being India's geographical size and the diversity of its electricity usage, electricity is a "concurrent area" under the Indian constitution – i.e. both the Central and State Governments in India may legislate on the subject. Each State has the power to legislate in respect of matters relating to the generation, transmission and distribution of electricity within its territorial domain. The Central Government, through the Ministry of Power, is primarily responsible for the development of electrical energy throughout India and for formulating and evolving Indian policy in respect of energy.



Power for all: 78,000 MW of new capacity by 2012

India's Electricity Act 2003 (the Electricity Act) completely restructured the country's power sector, the main aim being to break up each State's vertically integrated electricity supply entities into a transmission utility and a number of generating and distribution utilities. The Electricity Act also introduced open access to transmission networks² and mandated the introduction of open access to distribution networks by the end of 2008 for bulk customers. The Act de-licensed generation³ and provided for automatic approval for foreign direct investment for 100 per cent foreign equity without any upper limit on the quantum of investment across all aspects of the power sector (including power trading). Guidelines for the development of projects through competitive tariff-based bidding were set, along with guidelines encouraging competition in the development of transmission projects. For the first time, captive power plants were freely permitted. The Electricity Act also set out the minimum percentage of electricity that each distribution utility must source from renewable sources.

A National Electricity Policy was adopted in February 2005 to supplement the Electricity Act, and a Tariff Policy Resolution, published in January 2006, detailed the tariff policy reforms that were part of the National Electricity Policy. The current Five-Year National Electricity Plan was announced in August 2007. In addition to the substantial addition of capacity, India's National Electricity Policy focused on low-cost generation, utilisation of non-conventional energy sources, development of the National Grid including inter-State interconnections, and reform of India's distribution systems and electricity regulation.

While implementation of the Electricity Act across India has not been perfect (for example, open access to the grid remains an issue in some States), there is a general view among commentators that the Act has been successful in encouraging much-needed private investment in the sector.

Opportunities in the generation sector

In the past, private investors have been wary of the Indian power sector. The poor financial state of many State electricity boards, due principally to uneconomic tariffs and inordinately high network losses, made it difficult for the private sector to invest with confidence. However, circumstances have changed in recent years and the electricity sector is now attracting substantial private sector investment.

India's capacity addition programme

As of 31 May 2009, India's total installed generation capacity was 149,391.91 MW⁴ comprising

approximately 65 per cent thermal, 25 per cent hydro, 8 per cent renewables and 3 per cent nuclear (see table below for further details).

Fuel type	Installed capacity	Percentage of total
Coal and lignite	77,948.88 MW	53.3%
Hydro	36,877.76 MW	24.7%
Gas	14,734.01 MW	10.5%
Renewables ⁵	13,242.41 MW	7.7%
Nuclear	4,120 MW	2.9%
Oil	1,199.75 MW	0.9%

The National Electricity Policy estimates that India's annual consumption of electricity will rise from the present level of 631 units per capita to 1,000 units per capita by 2012. Since 2000, India's energy supply and peak demand deficits have been steadily increasing, representing a 9 per cent deficit in respect of energy supply and a 15.2 per cent deficit in respect of peak demand in the 2007-2008 period. While generation capacity has been steadily increasing (and reliability of supply improved), India's demand continues to far outstrip supply. It is not surprising, therefore, that the Eleventh Five-Year Plan (for the period 2007 to 2012) has sought to intensify generation capacity addition.

Under the Eleventh Five-Year Plan, the proposed capacity augmentation programme to be undertaken during the period 2007 to 2012 is anticipated to include the addition of approximately 59,000 MW of thermal generation capacity, 16,000 MW of hydro generation capacity and approximately 3,000 MW of nuclear generation capacity (see table below for detail).

Projected additional capacity				
Sector	Hydro (MW)	Thermal (MW)	Nuclear (MW)	Total (MW)
Central	9,685	26,800	3,380	39,865 (50.7%)
State	3,605	24,347	0	27,952 (35.5%)
Private	3,263	7,497	0	10,760 (13.8%)
Total	16,553 (21%)	58,644 (74.6%)	3,380 (4.4%)	78,577 (100%)

Of the 78,577 MW of total additional capacity proposed to be undertaken in the period 2007-2012,

7,500 MW (or about 9.5 per cent) have already been commissioned, and projects of 60,000 MW (or about 77 per cent) are already under construction. Despite this, India's Planning Commission recently stated that it will miss its target of installing 78,577 MW of additional electricity generation capacity by 2012 as several projects are yet to achieve financial close. Nonetheless, industry sources foresee the addition of approximately 60,000 MW by the time the current plan ends, which is in itself a considerable achievement.

The next Five-Year Plan, which starts in 2012, is likely to contain even higher capacity targets, with the plan calling for approximately 100,000 MW of new capacity to be added to the Indian system. What is even more interesting is the projected ownership: while the majority of existing generation capacity is in the hands of public sector undertakings such as National Thermal Power Company (NTPC) and National Hydro Power Company (NHPC), the percentage of private generation capacity ownership is projected to rise from around 27 per cent to 63 per cent by the end of the next Five-Year Plan. This figure represents both a significant opportunity and a significant challenge for the private sector. There are clear signs that the Indian private sector is responding to this challenge, with companies such as Reliance Energy, Tata Power and Essar becoming increasingly active in the generation sector.

In addition to a massive capacity addition programme, India is also committed to improving the performance of its existing thermal power stations. A renovation and modernisation programme was launched by the Government of India in 2005 to improve the performance of thermal power stations which had been operating for more than 15 years and whose plant load factor had fallen below 60 per cent. Under the programme, poorly performing thermal power stations were partnered with more efficient utilities such as Tata Power in order to facilitate technical and commercial recovery of units. The Central Electricity Authority identified 26 such thermal power stations (with an aggregate generation capacity of 8,455 MW) to participate in the programme, which, on average, has resulted in an increase in plant load factors from 44 per cent to approximately 53 per cent in the 2007-2008 period⁶.

Ultra mega power projects

Recognising that the "power for all" policy requires considerable and rapid augmentation of generating capacity and affordable tariffs, the Government of India also launched an initiative to develop coal-fired ultra mega power projects (UMPPs). UMPPs are typically developed on a build-own-operate (or BOO)

basis and with a capacity of at least 4,000 MW. These initiatives were encouraged largely on the basis that economies of scale would be achieved through "supercritical" and "ultra-supercritical"⁷ technologies resulting in the generation of cheaper power. The choice of project developer is based on a tariff-based competitive bidding process in order to ensure that supply quality and quantity requirements are maintained.

To facilitate these huge projects, the Indian Ministry of Power has taken a lead role in co-ordinating the myriad of departments and State governments which may impact the UMPP. In conjunction with the Ministry of Power, the Power Finance Corporation of India (PFC) is the nodal agency responsible for carrying out the UMPP bid process and for completing certain activities prior to the award of the project, in order to enhance investor confidence and elicit a greater number of competitive bids. For each project, PFC establishes a wholly-owned special purpose vehicle (SPV) which owns and develops each asset to the point where it is appropriate for a tariff-based competitive bidding process to be undertaken. In particular, the Ministry of Power or the SPV is tasked with conducting the "request for proposal" process, acquiring land for the project, obtaining allocated captive coal blocks (for pithead projects), obtaining any necessary water allocation, obtaining forestry clearance permits and initiating the environmental impact assessment report process. In addition, the Ministry of Power is tasked with inter-State power allocation, negotiation and completion of the relevant power purchase agreements and ensuring the provision of adequate payment security for such agreements at State level. While the steps taken by PFC through the SPVs to accelerate the projects have clearly been helpful, implementation of the process for obtaining the necessary permits has not always been perfect.

To increase their attractiveness to investors, the Electricity Act provides certain fiscal incentives in respect of UMPPs, including zero customs duty on the importation of capital goods and an income tax holiday for ten years for generating companies. To further allay any concerns on the part of private investors regarding revenue stream security, some UMPPs benefit from a multi-tiered payment security regime, including the provision of a 12-month revolving letter

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of credit and the escrowing of receivables. However, the primary reason that the UMPPs are seen as attractive for private sector sponsors and their funders seems to be the economic robustness of these projects. The initial UMPPs have managed to set very competitive tariffs: these tariffs, combined with the freedom under the Electricity Act to sell power into India's wholesale merchant market (where prices are often much

higher than the tariff payable by the offtaker) in the event of an offtaker's default, have given investors confidence that the projects will continue to generate cashflow even where an offtaker under the power purchase agreement defaults. In any event, because of the large size of UMPPs, offtake is usually undertaken by several distribution companies under separate power purchase agreements, which spreads individual payment default risk.

India's Central Electricity Authority identified nine sites in various States to be developed as UMPPs⁸ – four at pithead⁹ and five on the coast¹⁰. Four sites have already been competitively bid and awarded: Sasan (pithead Madhya Pradesh), Tilaiya (pithead Jharkhand) and Krishnapatnam (coastal Andhra Pradesh) awarded to Reliance Power, and Mundra (coastal Gujarat) awarded to Tata Power. Mundra and Sasan have now achieved financial close (April 2008 and April 2009 respectively).

The benchmark tariff responses to the Sasan, Krishnapatnam and Mundra projects bore out expectations that the UMPP initiative would result in reduced electricity tariffs, driven by the competitive process. The projects also attracted considerable interest from various established developers in the Indian national and international infrastructure sector, with a total of 36 expressions of interest received in relation to the Mundra UMPP, 12 of which satisfied the qualification criteria, with six ultimately submitting financial bids.¹¹

It is worth noting that the UMPPs have been successful in attracting mainly Indian developers – few international developers have participated to date. Indian developers no longer feel the need to partner with foreign developers and are more confident in their ability to deal with local political issues such as permitting.

Merchant power plants

In addition to UMPPs and mega power projects, the reforms instituted by the Electricity Act have also facilitated the construction and development of merchant power plants (i.e. power generating facilities which are financed without fully committed long-term power purchase contracts). Merchant power plants are seen as a viable way of increasing India's generating output, and operate competitively in line with the fundamental aims of supplying power efficiently and to the areas where it is most needed. One attraction is that some merchant power plants (base load plants) supply power to the grid at a stable rate, while others (peaking plants) only generate when demand is high. Merchant power plants absorb market risk and compete for customers and revenue streams – there is no security or guarantee to protect a minimum level of offtake and the risk profile for sponsors is therefore very different from plants which benefit from a long-term power purchase agreement.

Investors may seek to follow the "hybrid" route of certain merchant power plants currently being financed in India, whereby offtake contracts are entered into to guarantee a suitable portion of the project's fixed charges for a period sufficient to cover the amortisation of project debt, with the balance of the project's capacity retained for short-term trading, enabling the project to benefit from demand-supply mismatches in the market. Some of these offtake arrangements may be with power traders and not necessarily with a distribution company or industrial consumer. This portfolio offtake approach enables offtake risk to be spread across a number of entities rather than being concentrated in one entity. Interestingly, Indian banks are increasingly comfortable with a degree of merchant risk, one lender recently confirming that it is generally happy to see up to 25-30 per cent of plant capacity being uncontracted and sold on a merchant basis.

Nuclear

With the US Congress having given the nod to the Indo-US nuclear deal, the Indian nuclear industry is moving towards achieving its planned capacity installation of 20,000 MW by 2020.

India currently has an installed nuclear power generation capacity of 4,120 MW, with another 3,380 MW in various stages of construction and due to be completed by 2012. India's nuclear sector currently remains under public sector control. However, there have been several signals from Central Government suggesting that it may be opening the sector to private participation. Approximately 40 private and public sector companies have already announced plans to enter the sector.

In conventional technology terms, the Indian power sector has developed to the extent of being able to cater largely for its own growth and development requirements. Where external assistance is required is in sourcing higher levels of equipment using supercritical and ultra-supercritical technologies to help reduce coal consumption and improve efficiencies. The Central Government has specified that technology transfer to a local partner and joint manufacturing with an Indian industrial establishment are essential prerequisites for the selection of foreign reactor vendors offering the new generation of light water reactors.

The Nuclear Power Corporation of India Ltd (NPCIL) initially engaged in negotiations with four prospective suppliers: Areva of France, GE-Hitachi (US-Japanese), Westinghouse (owned by Toshiba) and Atomstroyexport of Russia. Russia is already supplying India's first large nuclear power plant, comprising two VVER-1000 (V-392) reactors, under a US\$3bn Russian-financed contract. In February 2009, NPCIL signed a memorandum of understanding with Areva to build two, and later four, more pressurised water reactor units at Jaitapur. Areva submitted its bid to build the first two such units in July 2009 with a view to commissioning in 2017 and 2018. In March 2009, GE-Hitachi signed an agreement with NPCIL to begin planning to build a multi-unit power plant using advanced boiling water reactors, with discussions ongoing in relation to the proposed site. In May 2009, Westinghouse signed a memorandum of understanding with NPCIL for the deployment of its AP1000 reactors using local components. NPCIL also signed an agreement with Korea Electric Power Co (KEPCO) to study the prospects for deploying Korean APR-1400 reactors in India, although this co-operation will depend upon the establishment of a bilateral nuclear co-operation agreement between the two countries.

Among the Indian firms that have long associations with the Indian nuclear industry, the most notable are Bharat Heavy Electricals Limited (BHEL) from the public sector and Larsen & Toubro Limited (L&T) from the private sector. Both have been supplying equipment (including critical equipment such as reactors and end-shields), systems and services to NPCIL for the earlier domestically-built Indian pressurised heavy water reactors. It is likely that NPCIL will encourage the selected foreign technology suppliers to team up with these two Indian principals. GE-Hitachi and Atomstroyexport each have formal co-operation arrangements with L&T, and Westinghouse has also indicated its willingness to co-operate with L&T. In addition to BHEL and L&T, more Indian industrial houses are lining up to join with suppliers

and recipients of nuclear technologies and material, or to join NPCIL in power generation.

In the meantime, the global nuclear industry awaits the Government of India's policy declaration in respect of allowing private companies to establish and own nuclear power projects.

Subsisting weaknesses in the electricity sector

Among the various sectors in India's infrastructure spectrum, power is probably the most important and yet is regarded as the weakest. This perception is made more acute by the fact that its weakness impacts the economy across the board and has a significant negative impact on India's rate of growth. Some weaknesses in the sector are explored further below.

Transmission and the national grid

India's transmission lines have grown exponentially, from 3,708 circuit kilometres (ckm) in 1950 to more than 211,000 ckm today; by 2012, they are expected to total in excess of 293,000 ckm. Capacity increases of the magnitude required under the Eleventh Five-Year Plan are estimated to require India's current transmission grid capacity of 143,000 MW to be increased to 200,000 MW, its current inter-regional transmission capacity of 17,000 MW to be increased to at least 38,000 MW and its substation capacity to be increased by approximately 50 per cent from current levels. To facilitate funding of transmission and distribution projects, the Government of India has created a National Electricity Fund to finance projects for which conventional funding is not easily available. It has also established guidelines encouraging competition in the development of transmission projects. However, to date, only one joint venture transmission line has been constructed¹².

Much has been done over the past five years to increase and strengthen India's national grid, with the period seeing a shift in grid development planning from regional self-sufficiency to national level planning. By improving grid transmission, moving to availability-based tariffs and enforcing grid discipline, India has enhanced the security and reliability of its power supply, and once commonplace grid disturbances have noticeably diminished. Transmission network operators

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have also been required by the Electricity Act to offer open access to transmission capacity on a non-discriminatory basis.

In 2005, the Government of India established the Village Electrification Programme to facilitate countrywide electrification.

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Somewhat less than 45 per cent of rural India has electricity supply and approximately 55 per cent – or 600,000 villages – still require the whole range of services including distribution, supply, metering, billing and revenue collection. The Indian people as a whole, however, appear to have some resistance to private ownership of the electricity sector and consequently India's distribution

system is only partially privatised, with many distribution companies remaining in the control of the Government. This presents a formidable technical and administrative challenge to India's power sector administrators. Nevertheless, it is a challenge which must be overcome since reform of India's distribution sector, susceptible as it is to many important stakeholder interests (those of its utilities, political systems and consumers), is pivotal to the success of its electricity system. Effective commercialisation is integral to enabling cross-subsidies in the tariff structure to be eliminated, and with this the imposition of cost-reflective tariffs encouraging the efficient use of power.

Fuel supply issues

Domestic coal remains the principal fuel for power generation in India. Following nationalisation of the coal mining sector, coal was predominantly produced by India's State-owned coal producer holding company, Coal India Ltd (CIL), with the intention that CIL would supply coal to all power plants. However, CIL consistently defaulted in delivering the contract quantities of coal (both in terms of quality and quantity), thereby seriously affecting generation plant load factors. As a result, and due to the increasing need to create additional generation capacity, the Central Government has permitted private sector participation in captive coal mining for the generation of power¹³. Captive coal blocks with sufficient mineable reserves for the life of the project may be allocated to

power generating companies themselves for exploitation by the project, as was the case with the Sasan and Tilaiya UMPPs. However, the allocation process for such captive blocks remains cumbersome, limiting the effectiveness of this initiative.

In order to overcome the perennial coal demand-supply mismatch which plagues the power generation sector¹⁴ (for 2009-2010, there is a projected coal deficit of approximately 16 per cent), India's Central Government policy also facilitates the importation of superior quality, high calorific value coal for blending with substantially cheaper high-ash content domestic coal. Both the Mundra and Krishnapatam UMPPs are intending to source imported coal from the market. Indeed, many private developers are already looking at the acquisition of coal assets overseas.¹⁵ However the quantum of the shortfalls and projected shortfalls in required coal quantities would necessitate the importation of large volumes of coal, which would strain India's port-handling capacities and require enormous rail transport infrastructure. Thus, while imported coal may mitigate the demand-supply mismatch for coastal thermal plants, unavoidable transport bottlenecks mean that it is problematic for plants located deep within the sub-continent.

In addition to its preponderance of coal-fired generation, a substantially lesser proportion of India's power (approximately 5,200 MW¹⁶) is generated using natural gas supplied by GAIL (India) Limited, mostly from the Bombay High offshore field on the west coast of India. Like all natural gas fields, however, the life of this field is limited and production is likely to start declining by 2012. Natural gas from Block D6 of the Krishna-Godavari basin, off the eastern coast of India, a proportion of which is earmarked for supply to India's power sector, is presently being developed by Reliance Industries Limited, with the field having commenced production and expected to supply gas at an initial rate of 15 mmscmd (million metric standard cubic metres per day), gradually rising to a peak flow of 80 mmscmd.

On India's west coast, liquefied natural gas (LNG) sourced from West Asian gas-fields is delivered to and regasified at LNG terminals established and operated by Petronet and Shell, for offtake by power projects mainly in Gujarat. However, the fall in international crude oil prices, which also resulted in a steep fall in global naphtha prices, led many of India's generators to switch to naphtha rather than regasified natural gas as a fuel. This shift of demand to replacement fuel and away from LNG upset the economics of Shell's LNG terminal in Hazira (Gujarat), which previously took delivery of approximately three spot cargoes per month earmarked for the power sector¹⁷. While

demand has now resumed, LNG suppliers seeking to arbitrage global LNG prices are likely to continue to supply their LNG into the most profitable markets, which may result in diversion of supply from India's power sector.

Institutional obstacles

While India's policy-makers have taken a holistic view of the Indian power sector, encompassing legislative and regulatory amendments and reform across the generation, transmission and distribution sectors, weaknesses remain in the implementation of the various reform measures enacted by the Central Government. Some State Governments have been either slow to introduce the reform measures or unable to put them into effect due to resistance from vested interests. Some 13 Indian States have reorganised their State Electricity Boards (SEBs) and unbundled utilities as required by the Electricity Act. Eight States, including Bihar, Jharkhand, Kerala, Punjab, Chattisgarh, Tamil Nadu and Himachal Pradesh, are still in the process of formulating schemes for the reorganisation of their SEBs, creating problems for the Central Government in approving and financing schemes under the Five-Year Plans.

The Electricity Act championed the rationalisation and phasing-out of cross-subsidies. However, six years after its enactment, cross-subsidisation continues, with industry and commercial consumers continuing to pay excessively high tariffs in order to balance the artificially low tariffs payable by agricultural and domestic consumers. In 2008, for example, the average tariff for commercial supply was Rs. 4.90/kWh (US\$0.1/kWh) and for industrial supply was Rs. 3.09/kWh (US\$0.07/kWh), compared to an average tariff for agricultural supply of Rs. 1.15/kWh (US\$0.03/kWh) (with agriculture accounting for approximately 25 per cent of the total power consumed in the country for that year). Vested interests (including political parties) continue to resist even a graduated levelling of tariff for the various different consumer segments, making elimination of cross-subsidies a distant hope and even reduction difficult to achieve.

Financing

It should be noted that the overwhelming majority of bank debt invested in the generation sector has come from Indian financial institutions, both private and public. This is hardly surprising, given the current liquidity of Indian banks, the fact that power generation is very much a national, and not cross-border, business and given that tariffs are denominated in rupees with no dollar linkage. Whether the Indian financial institutions can continue to provide the necessary funding for the build-out of the power

generation sector remains to be seen. At an approximate capacity cost of US\$1,000 per kW and debt-to-equity ratio of 75:25, the 100,000 MW of capacity in the next Five-Year Plan amounts to a debt requirement of approximately US\$75bn. To date, there has been some limited involvement from international financial institutions in the UMPPs, but principally from regional development banks such as the Asian Development Bank, and from export credit agencies such as KEXIM. If India is to achieve its ambitious capacity generation targets, some commentators believe that further efforts must be made to widen the pool of available capital by further attracting foreign bank debt.

Conclusion

The availability of a reliable supply of energy is key to India's sustainable (and sustained) development. India's ability to support the growth of its GDP (projected by India's National Electricity Policy to be a rate of 8 per cent) with sufficient quantities of reliable power represents a huge challenge. The reforms instituted by the Electricity Act have gone some way to introducing commercial viability in India's power sector, but much remains to be done. Cross-subsidies must be phased out and open access enforced to encourage further merchant power plants to be developed. The investment challenge is enormous and can only be met with sustained private sector participation.

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Notes:

- 1 Indian National Electricity Policy and Eleventh Five-Year Plan 2007-2012, Volume 1, Inclusive Growth, page 255.
- 2 For loads greater than 1 MW.
- 3 This de-licensing also permits any generator of electricity to distribute electricity in a rural area without the requirement for any licence.
- 4 Figures from the Indian Ministry of Power, Annual Administration Report.
- 5 Including small hydro projects, wind, biomass, urban and industrial water power.
- 6 Central Electricity Authority, Review of Performance of Thermal Power Stations 2007-2008, published September 2008.
- 7 Supercritical and ultra-supercritical technology refers to the type of steam generator adopted in the power plant. Supercritical generators operate at a higher pressure (over 3,200 psi) than traditional technologies and ultra-supercritical generators operate at a higher pressure again (over 4,400 psi). By operating at such pressures, the water used to generate steam does not boil but rather vapourises into steam directly, resulting in the plant being more efficient due to slightly less fuel use.
- 8 Mundra in Gujarat, Krishnapatnam in Andhra Pradesh, Tadri in Karnataka, Girye in Maharashtra and Cheyyur in Tamil Nadu.
- 9 Sasan in Madhya Pradesh, Tilaiya in Jharkhand, Sundergarh District in Orissa and Akaltara in Chhattisgarh.
- 10 Tamil Nadu and Karnataka have also identified two additional sites for development at Marakanam and Ghataprabha in the Belgaum

- district respectively. The preliminary feasibility of each of these sites is currently being examined by the Central Electricity Authority.
- 11 Project Finance International Market Intelligence, Financing Global IPPs, "Mundra UMPP – The Largest Power Project in India", page 186.
 - 12 Power Grid Corporation of India Limited and Tata Power established a transmission line which transmits power generated by the Tala Hydro Project in Bhutan into India's North-East interconnector.
 - 13 Private sector participation was facilitated through an amendment to the Coal Mines (Nationalisation) Act 1973 which took effect from 9 June 1993.
 - 14 India's 2008-2009 annual coal production plan stipulated that power utilities would require 373m tonnes of coal of which approximately 337m tonnes would be supplied by CIL and its subsidiaries. The deficit of 36m tonnes is intended to be substantially met by the importation of 20m tonnes of superior high calorific value coal.
 - 15 Tata Power has acquired stakes in coal mines in Indonesia.
 - 16 GAIL (India) Limited website (<http://www.gailonline.com>).
 - 17 Shell reportedly bought a spot cargo in January 2009 following the period of weak demand which forced it to stop terminal operations.

Ashurst's power sector expertise

Ashurst is one of the world's leading law firms advising in the power sector. With a specialist power team across Asia, Europe and the Middle East and over 90 dedicated energy and infrastructure lawyers worldwide, we can assemble teams to provide high quality advice tailored to our clients' needs.

In an industry where understanding the commercial aspects of a deal is vital, Ashurst lawyers have a thorough understanding of the global power market, the players and the documentation (commercial and financial).

Members of our team have invaluable commercial experience from time spent in-house at leading industry players. We have helped deliver some of the largest and most complex power deals in recent years and our experience spans the complete spectrum of these industries including advising:

- sponsors from pre-development phase through to financial close on large IWPPs;
- funders (both conventional and Islamic) on complex multi-sourced financings;
- export credit agencies; and
- contractors on EPC and O&M arrangements.

Ashurst and India

Ashurst has been active in the Indian market since the first phase of deregulation and liberalisation, and we have had a licensed liaison office in New Delhi since 1994. Our liaison office plays an invaluable role, providing logistical and communication support by obtaining information from the government and regulatory agencies, liaising with local lawyers and facilitating communications between Ashurst's other offices and parties in India.

Key features of our India group include:

- a dedicated India team across Europe, the Middle East and Asia, comprising over 40 English and Indian qualified lawyers;
- a strong track record of successfully concluded deals in India;
- lawyers who understand the legal, regulatory and cultural issues involved in doing business in India;
- advice on strategy and policy in India, based on the extensive knowledge and experience of members of the group; and
- a liaison office in New Delhi which provides up-to-date information, and research and analysis on the legal, business and political scene in India.

We have teams of Indian qualified lawyers in our offices in London (focusing on the UK and Europe), Dubai (focusing on the Middle East and Africa) and Singapore (focusing on Asia) in order to advise clients on investing in India wherever their location. Our Indian lawyers work as part of our deal teams servicing the needs of clients investing in the Indian roads sector.

For more detail on Ashurst's experience in India or on our India group, please speak to any of the contacts listed below.

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