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## Renewable Energy to Supply Power through National Grid

The country's renewable energy producers will be allowed to add electricity to the national grid to help them earn money and mitigate supply shortfall. They generate 15 megawatt (MW) of power by using solar power, biogas and wind. "The sponsors of the renewable energy producers will be able to provide electricity to their consumers through the state-controlled electricity national grid," said Power Secretary M Fozul Kabir Khan.

He said the state-owned power entities will purchase the renewable electricity offering attractive rates to encourage more production of such energy. "Investments from both local and foreign companies will be encouraged under a proposed renewable energy policy. We are now working on adoption of the country's first-ever renewable energy policy to woo investments for electricity generation from unconventional resources", Dr Khan said.

He said it will help harness the potentials of renewable sources for power production. It will facilitate mass use of clean energy and thus mitigate the nagging electricity crisis across the country. Under the policy, the Government is considering introducing a mandatory provision of use of solar power system in multi-storied buildings and apartments for lighting and water heating. Necessary changes will also be brought to the existing building code to incorporate the mandatory use of solar power system in high-rise buildings.

The Government power cell has already drafted the renewable energy policy under which a guideline will be prepared to boost electricity generation from renewable energy sources. The Government has taken the initiative to formulate the renewable energy policy as it struggles to cope with the mounting electricity demand in industries, farming, commercial activities and households. Chief Adviser Fakhruddin Ahmed inaugurated a national campaign for increased use of renewable energy and energy conservation across the country.

Currently, the country's total power generation is hovering around 3,500 MW against the estimated demand for over 5,000 MW a day. Several public, private and non-governmental organisations (NGOs) have installed a number of renewable energy units like solar, wind, bio-gas across the country with support from donor agencies to ease electricity crisis. The proposed renewable energy policy will also help explore community-based renewable energy generation for different applications and its multipurpose use in off-grid areas of Bangladesh.

Currently, the Local Government Engineering Department (LGED) has a number of solar power projects supplying electricity to shops and over 150 families, including those of tribals and fishermen. The state-owned LGED also installed some ten wind-mill energy projects, one micro hydropower project and over 1,000 biogas projects across the country. The Rural Electrification Board (REB) has installed solar power system for over 800 consumers of two riverine islands of Narshingdi.

The Infrastructure Development Company Ltd (IDCOL) has installed over 180,000 solar home systems through its partner organisations. It has targeted to finance 900,000 solar home systems by the year 2012 with assistance from World Bank, Global Environment Facility (GEF), Asian Development Bank (ADB), Kreditanstalt für Wiederaufbau (KfW) and Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ). *Grameen Shakti*, another local NGO, has installed over 77,000 solar power systems and 500 biogas plants for over 700,000 people of different coastal areas.



<http://bangladesheconomy.wordpress.com> 31.08.08

## Businesses Hails Power Sector for Private Investment

The leading business leaders hailed the Government's decision to open up the country's power sector for private investments to expedite development of this ailing sector. They said extensive private sector involvement in electricity generation would ensure uninterrupted power supply to their industries, reduce production costs and time and thus augment industrial output substantially.

According to Power Ministry, the Government has decided to allow setting up of merchant power plants by private entrepreneurs where the power producers would have the liberty to select their clients and sell electricity at their choices. A merchant power plant policy would be adopted soon to encourage private investments in the power sector under a regulated framework.

"The Government must have to adopt a transparent policy to attract substantial investments from the private sector", said the Federation of Bangladesh Chambers of Commerce and Industry (FBCCI). President of Bangladesh Garment Manufacturers' and Exporters' Association (BGMEA) Anwar-ul-Alam Chowdhury Parvez said, "The industrialists want uninterrupted electricity supply to their enterprises to ensure optimum production and timely shipment. Private sector involvement would help in stopping frequent electricity disruptions in the industrial units".

Currently the industrialists spent a lot of money to install generators in their factories as back-up support during load shedding that costs over billions of takas. "Total expenditure of the country's garment factories increased by Tk 500 million (US\$7.30mn) a month only for purchase of diesel at higher rates to Tk 55 (US\$0.80) a litre from its previous price of Tk 40 a litre", a top leader of the business body of the country's highest export earning garment sector said.

A medium-sized garment factory having the working force between 1,000-1,200 has to spend over Tk 1.0 million (US\$0.01mn) a month to arrange back-up power support of industries, he said. "The industrialists would likely consume electricity from the merchant power plants even if it becomes costlier than the government-supplied electricity to get quality services", said Bangladesh Knitwear Manufacturers and Exporters Association (BKMEA) President Fazul Huq said.

He said the move should be implemented as quickly as possible to relieve the businessmen from the curse of frequent electricity disruptions.



#### BPDB to Improve Efficiency, Raise Power Tariff

The Bangladesh Energy Regulatory Commission (BERC) will ask state-owned Bangladesh Power Development Board (BPDB) to improve its efficiency and raise power tariff on an average by 20 percent for power distribution companies. This will, however, not make any change to tariff rates for the retail consumers, including the households and industries.

The move by the BERC will be first of its kind in the country's energy sector where power tariff will be determined by an entity other than the Energy Ministry. The Commission will ask the BPDB to improve its efficiency ensuring transparency and accountability in its activities.

All the power sector stakeholders, including the BPDB, power distribution companies including Dhaka Power Distribution Company Ltd (DPDC), Dhaka Electric Supply Company Ltd (DESCO) and the Rural Electrification Board (REB) have been asked to remain present during the announcement to be made at the BERC office. The BERC is going to announce the enhanced rates following a BPDB's proposal for electricity tariff hike by 41 percent on an average for both bulk and retail consumers to offset the mounting losses of the state-owned power entities.

A public hearing was also held in August 2007 where the BPDB tried to justify its tariff hike proposals before the power sector stakeholders. On previous occasions, the Energy Ministry independently raised power tariffs. The Ministry last increased the electricity tariff on March 01, 2007 by 10 percent for bulk and 5.0 percent for retail consumers.

But this time, the BERC is raising the tariff for the power distribution companies that purchases electricity from the BPDB. "We have agreed to increase the power tariff for bulk consumers considering the increase in the cost of operation," the BERC chairman told the FE Saturday. But the extent of the power tariff hike will not definitely be 41 per cent as demanded. "The demand is irrational," the chairman said. To increase power tariff for the retail consumers the distribution companies will have to seek permission from the BERC, a senior commission official said.



*The Financial Express, 28.09.08*

#### World Bank to Support Bangladesh to Increase Power Supply

The Bangladesh Government has successfully concluded negotiations with the World Bank for US\$350mn Siddhirganj Peaking Power Project (SPPP). The proposed project will be Bangladesh's first integrated gas-to-power project, and will contribute 300 MW of generation capacity to help address the country's shortage of power.

M Fouzul Kabir Khan, Secretary, Power Division, Ministry of Power, Energy and Mineral Resources and Alan F Townsend, Senior Energy Specialist, World Bank led the Government and the International Development Association (IDA) delegations, respectively at the negotiation concluding on September 17, 2008. SPPP will increase the power supply during periods of peak demand in Bangladesh. The project would begin operation in 2011, following the construction period.

The project includes three linked infrastructure components, and will help the country make efficient use of scarce natural gas resources while reducing power outages which have become a huge burden to Bangladeshi households and businesses.

The project will construct state-of-the-art 300 MW gas turbine power plant at Siddhirganj. It will also build a 60 km natural gas pipeline to link the main natural gas transmission network to the Siddhirganj site, and an 11 km electricity transmission line so that power from the plant can be delivered to the distribution network. The project also aims to strengthen the three implementing agencies: Gas Transmission Company Limited (GTCL), Electricity Generation Company of Bangladesh (EGCB), and Power Grid Company of Bangladesh (PGCB).

The credit is scheduled for World Bank Board consideration and approval on October 30, 2008. The credits from the IDA, the World Bank's concessionary arm, have 40 years to maturity with a 10-year grace period; they carry a service charge of 0.75 percent.



*World Bank, 18.09.08*



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#### India to Foray in Nepal's Power Sector

The Power Trading Corporation (PTC) and Australian company Snowy Mountain Corporation have initiated a Power Purchase Agreement (PPA) for the Asian Development Bank-promoted 750 MW West Seti Hydroelectric Power Project in Nepal. While a private Nepal party will hold 10 percent stake, ADB will have 15, Snowy Mountain Corporation 25, a Chinese company 15 percent, an equal stake by IL&FS and the rest by the Nepal Government.

While the Engineering Procurement and Construction (EPC) project has been bagged by a Chinese company, 90 percent of the power would be bought by India under the terms and conditions of the agreement. Announcing this after initialing the PPA, Minister of State for Power, Jairam Ramesh said the project would be 187 X 4 units with an expected generation of around 3,251 million units a year.

This is India's first major entry into Nepal's power sector. When the project begins production, it would give revenue of US\$60mn per annum to the Nepal Government. In India, the likely beneficiaries of the project would be Uttar Pradesh, Haryana, Punjab and Delhi. The best part of this hydro venture is that the project would be able to generate high amounts of power even during winter months. A total of 135 km of transmission line from the project site up to the Indo-Nepal border would be laid from the Nepal side and another 100 km to Atamanda, near Bareilly on the Indian side.



**NEA Plans Hike in Power Tariff**

The Nepal Electricity Authority (NEA) has proposed an increase of electricity tariff by around 15 percent to gradually recover accumulated losses, reduce loss and create fund for hydropower development. According to a report unveiled during the NEA's 23rd anniversary, NEA incurred a loss of 25.15 percent in the fiscal year 2007-08, which stood at 26.71 percent the previous year.

Arjun Kumar Karki, Managing Director NEA said, "NEA earned Rs 15,405.03 million from sale of electricity in 2007-08, which is 6.61 percent higher than 2007's figure. It earned Rs 655.24 million as other income". NEA has incurred a net loss of Rs 1,312.16 million after deducting interest, foreign exchange loss and provisions. However, it earned a profit of Rs 314.19 million the preceding year. Accumulated loss by the end of 2007-08 has reached Rs 7,133.77 million.

The power demand has been growing at the rate of 11.31 percent. But NEA hopes the load shedding, which reaches up to 40 hours a week in winter, could be scrapped by next five years.



<http://www.nepalnews.com/archive/main.htm>, 19.08.08

**CFL Could Pose Environmental Hazard**

To reduce the escalating electricity bills and also help save energy will persuade one to look for alternatives. But in the process, hardly one pays much attention to the dangers lurking in such alternatives.

The long life Compact Fluorescent Lamp or CFL – that consumes far less energy than the conventional incandescent light bulb – is being promoted as an alternative that will help save energy as well as cut costs in the long run. The good news is that the energy-saving lamps will also help reduce greenhouse gas emission, the major cause of global warming attributed to burgeoning human activity.

What has not received as much attention is the negative aspect: CFLs contain mercury vapour – mercury is one of the most toxic substances known to man – and coming in contact with it can prove dangerous, even fatal. The safety aspect arises in the event of breakage or disposal, when mercury vapour is released, and those handling it are ignorant of its effects.

Creating this awareness is vital in a place like Nepal where everything is picked, including incandescent bulbs, for recycling. Spent bulbs are broken, and the metal filament retrieved and melted, only to reappear in another form. The fact that lead content in the bulbs can pose a health hazard is not taken into account, especially since recycling in Nepal is done almost entirely in the unorganised sector, often in unhygienic conditions and by rag pickers who double as sorters and smelters.

Mercury poisoning – especially through leaching in landfills – is an old problem. Now the increasing popularity of CFLs has reopened the issue. Mercury has been found to contaminate groundwater, vegetables and fruits, where medical facilities and others have made dumping grounds. Clinical thermometers thrown away by hospitals and nursing homes that have no access to incinerators have been disposed off like any other garbage with little thought to public safety.

Even small quantities of mercury can be extremely toxic and harm the human nervous system, impair normal vision and hearing. Mercury is especially dangerous for children and foetuses. Effective information channels have yet to be established to create the awareness of the health hazards posed by CFLs.

In Nepal, most people engaged in rag picking and sorting are women and children. Even a little exposure to heavy metals like mercury and lead can build up in the human body to dangerous effect which is difficult to reverse. This fact, however, should not discourage people from buying and using CFLs; rather, promoters and traders, in addition to highlighting the lamp's virtues, should educate the consumer on precautions to be taken.



<http://www.gorkhapatra.org.np>, 29.08.08

**Third Indo-Nepal Power Summit**

The Minister of State for Commerce and Power Jairam Ramesh and a 60-member delegation will participate in the Third Indo-Nepal Power Summit 2008 in Kathmandu, on September 23, 2008. The two-day summit will explore possibilities of hydropower project cooperation between Nepal and India. Nepal's Home Minister Bam Dev Gautam will inaugurate the summit. About 300 delegates from Nepal and India will attend it.

Leading power developers from India, including GMR, L and T, Sutlaj JV, Jindal and IL and FS are taking part in the summit. The Nepal Government is organising the summit in collaboration with the Nepal India Chamber of Commerce and Industries (NICCI), and the Independent Power Producers Association of Nepal (IPPAN) with support from India's Power Trading Corporation (PTC).

During the summit, issues like the impact of Nepal's hydro power policies on future power projects, risks associated in financing power projects, availability of credit in financing power projects and installation of transmission lines to facilitate power exchange will be discussed. T N Thakur, Chairman of PTC India Limited, said, "This kind of discussion forum would highlight the multiple benefits that can accrue from balanced development of Nepal's hydropower, including thorough use of power trading options".

This platform would also address the current situation, impediments and future prospects of power trade and the development of the power sector as a whole, he added. Independent Power Producers' Association, Nepal (IPPAN) President, Sandeep Shah, said, "The summit aims to showcase the tremendous opportunities that Nepal has to offer in the area of hydropower".

With its abundant water resources, Nepal is an ideal destination for renewable power projects, including hydropower and investments as well, Shah added. Senior delegates from both India and Nepal will exchange their views, experience and expertise in hydropower sector with each other during the summit.

The summit is expected to open new doors of cooperation between Nepal and India in hydropower sector that would lead to economic prosperity and overall development of both the countries at a time when the Maoist led government in Nepal has spelt an ambitious plan to generate 10,000 MW of power within the next ten years.



<http://www.thaindian.com>, 22.09.08

**Nepal Turns to Indian Power Firms for Funding**

In a bid to raise resources for developing its hydropower sector, Nepal plans to offer Indian private sector developers majority stakes in mid-size joint ventures with a capacity of 300-500 MW. "The Indian partners will be offered majority stakes on condition that they raise the entire debt component for such projects", said Arjun Kumar Karki, Managing Director, NEA.

The Indian developers will get a 51 percent stake in such hydropower projects and NEA, representing the Nepal Government, a 25 percent stake. The rest will be offered to the public in Nepal and India. Nepal has emerged as a favourite destination for several Indian hydroelectric power generation firms due to its huge untapped potential. The companies that have plans to set up hydroelectric projects in that country include Satluj Jal Vidyut Nigam Ltd, Bhilwara Energy Ltd and GMR Infrastructure Ltd.

Nepal has an installed capacity of 617 MW, of which around 570 MW is generated from hydropower. Although Nepal has 83,000 MW of hydropower potential, it is facing a shortage of 100 MW, which is expected to increase to around 300 MW in the coming winters



<http://www.livemint.com/Home.aspx> 23.09.08



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#### Power in City is Just a Call Away

The power connection in Jaipur is just a call away. Jaipur Vidut Vitaran Nigam (JVVN) is going to launch this scheme in the Pink City.

JVVN Chairman R G Gupta said the applicants need to dial a toll free number (155333) to get a new electricity connection in the city. "An employee of the JVVN will reach the specified place as per the convenience of the applicant. He will fill up the form and help the applicant complete the other formalities. The corporation will charge the applicant only a nominal fee of Rs 50, which will be passed on to the employee for his extra efforts", said Gupta.

He said that Jaipur will become a cable free city within the next two years, which will ensure uninterrupted power supply, adding that the work of laying cable underground will be completed within the next two years and the JVVN has earmarked about Rs 300 crore for the purpose. Gupta said the state would have surplus power by March 2009 with the generation of an additional capacity of 2000 MW of power.

Elaborating on the ongoing feeder reform programme, he said about 33,000 villages in the State have been provided with round the clock supply of power equivalent to cities and by August 15, 2008 all the villages in the State will be covered under the scheme. "Except a few villages in the Ajmer Discom, 33,000 villages out of the 36,000 villages in the state have been covered under the scheme till now", said Gupta.

He said this feat has been achieved with an investment of Rs 3,500 crore. It will reduce the power transmission loss by 10 percent. Transmission loss in the state dropped from 40.22 percent in 2005-06 to 30.9 percent in 2007-08. Gupta said the Nigam has set a target of reducing the transmission loss to 5 percent by 2008-09.

He said, the transmission loss has come down in Jaipur by 50 from 24.23 percent in 2000-01 to 12.21 percent in 2007-08.



*Times of India, 01.07.08*

#### Central Excise Slaps Notice on State Discom

In a first of its kind, the central excise department has issued a showcause notice to the state-owned Rajasthan Rajya Vidyut Prasaran Nigam Ltd (RRVPNL) for evasion of service tax worth Rs 161.53 crore.

Chief Commissioner of Central Excise, Rajasthan, Rajesh Dhingra, said RRVPNL has been leasing out its distribution network to various private companies for transmission services to their plants and establishments. He said private companies like Hindustan Zinc, which have their own captive power plants, use the network of RRVPNL for transmission to different destinations. RRVPNL has been charging these private companies hefty sums under 'wheeling charges' which are taxable. But the power transmission company has paid any service tax for the past two years.

According to the Department, RRVPNL, in the past two years, earned Rs 1500.32 crore by lending its transmission network. At 12.6 percent, the service tax it owes is Rs 161.53 crore. Dhingra said it was for the first time in the country that the Department made a claim for service tax from a power transmission company for providing business support services.

The Energy Minister Gajendra Singh Khinvsar maintained that there were several such differences between the central and the state departments and he would look into it after going through the contents of the notice.



*Times of India, 26.07.08*

#### Police to Monitor Power Theft

Two more police stations were inaugurated in Rajasthan to exclusively monitor power thefts. Each of the stations at Dholpur and Baran, under the JVVNL territory, will be headed by an assistant sub-inspector.

JVVNL's Chairman and Managing Director R G Gupta said out of the 13 police stations sanctioned by the State Government in 2006-07 to deal with the high incidence of power thefts, 10 are now functioning. In the first and second phases of the programme, eight stations were opened to curb crimes related to power thefts, he said. The first police station was set up in April 01, 2007.

The personnel at the police stations have been given the power to arrest, jail and put to trial those found involved in theft of electricity or tampering of the equipment.



The Hindu, 03.08.08



- **West Bengal Gets its Power Reform Dynamics Right**  
– *Business Standard*
- **Nuclear Power Gives Energy Security**  
– *Times of India*
- **A History of Failed Power Policies and the Way Out**  
– *The Telegraph*

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### West Bengal Gets its Power Reform Dynamics Right

It is a fascinating turnaround story that is unfolding in West Bengal's power sector. The Left-ruled state managed to make its electricity board profit-making two years ago. In 2007, it split the board into a distribution company and a transmission company, both of which are earning profits. Interestingly, all this was done "without a single demonstration or court case", according to Malay De, Chairman of the West Bengal State Electricity Distribution Company Ltd (WBSEDCL), which was spun off from the electricity board in 2007.

WBSEDCL had revenue of Rs 6,500 crore in its first year of operation (2007-08), which is larger than that of telecom company Mahanagar Telephone Nigam Limited (MTNL) or real estate firm DLF. However, Rs 50 crore net profits it earned is a fraction of what firms in the same income bracket manage. A part of this profit is attributable to trading revenues, but since the state power regulator ensures that 90 percent of the trading profit is passed on to the consumer, the impact of these revenues on the profitability is limited, says De.

The profit would have been higher – at Rs 450 crore – had the trading revenues estimated at the beginning of the year been realised. "Potential benefit of Rs 760 crore trading revenue was passed on to the consumer but the company could only earn Rs 400 crore last year", explained De.

So what is the real story behind the turnaround, if it is not a trading spectacle? "Metering," says De. The 100 percent electronic metering project was started in 2002 and was followed up by meter-by-meter energy accounting and auditing. This was not a capital intensive process with just about Rs 100 crore invested till now.

There were no significant consumer protests against electronic metering, which was the case in Delhi where resident welfare associations raised strong objections to what were perceived as fast-running meters. "All initiatives flow from metering", says De, since it enabled the company to know exactly where the revenue leakages were taking place, and hold the local manager accountable. That was the stick of the policy. The carrot was performance linked incentives (PLIs).

The Aggregate Technical and Commercial (AT&C) losses, now down to 25 percent against the country average of 35-40 percent, were monetised and 15-20 percent given back to employees as incentives.

The corporate lingo: Incentives, corporate planning and professionalism are some of the many new buzzwords in the state's power sector today. The 10-member WBSEDCL board boasts no less than four independent heavyweight directors – former Telecom Secretary Shyamal Ghosh, former Chairman of Gail India Proshanto Banerjee, former Chairman of Indian Aluminium Tapan Mitra and former Commerce Secretary S N Menon.

"Our whole exercise was governance oriented", says the State's Additional Chief Secretary (Energy), Sunil Mitra, who personally tracked and persuaded the independent directors to join the board. Productivity is now tracked. WBSEDCL has 21,700 employees for its 7 million customers, which means about 320 customers per employee, compared with the global standard of 700 customers, says De. Incidentally, each employee served just 178 customers three years ago. This is quite a feat for a company whose average age of employees is over 50.

The fact that there were no lay-offs in the process, or any tariff shocks, made the whole turnaround a win-win proposition for all the stakeholders – the government, which does not have to budget for a power subsidy any more; the consumer, who benefits from flat-lower tariffs; and obviously the utility.

As a precursor to the split, the State Government did however write-off Rs 10,000 crore worth of loans and accumulated interest of the electricity board to enable the successor companies to begin with healthy balance sheets. "It is a significant transformation for a state which has traditionally not been considered progressive from a reform perspective", says KPMG's Executive Director Arvind Mahajan.

Inclusive model: West Bengal ensured that it was talking to all the key stakeholders through the process. The dialogue mechanism was a Joint Management Council comprising directors and heads of departments and the representative workers from recognised unions and associations. It was a time-consuming process but it ensured consensus decisions that were acceptable to the employees, 80 percent of whom were just high-school pass.

According to the Central Electricity Regulatory Commission (CERC) Chairman Pramod Deo, "West Bengal went about the whole process in a very systematic way. It is interesting the way they managed unbundling with the participation of the employees". Individuals matter: "The solution for the state power sector is not investments, but organisational transformation, which West Bengal managed", says Ashish Khanna, Financial Analyst at the World Bank who has been involved with the West Bengal reform process for the last few years. De and Mitra – whose earlier claim to fame was successfully privatising sick state units – are the current toast of the state's power circuit. "Individuals do make quite a bit of a difference and it would be good if there is continuity in this leadership", says Mahajan.

There are the sceptics who fear deterioration in the utilities' performance once the key people change, or if the gain from reduction in non-technical losses dry up and the cost of power generation (or purchase, since West Bengal has a peak deficit now) increases. Industry officials do not rule out a slide, though the likelihood of that happening decreases with corporate systems and processes that have been put in place, and with a board strengthened by independent directors.

De expects "a secular increase in tariff which will be moderated by efficiency improvements" in the future. The West Bengal example needs to be emulated by other state utilities which together ran up commercial losses of almost Rs 26,000 crore last year, yielding a negative return of 18 percent, according to the last economic survey. This estimate may be understated given that utilities like the





### Nuclear Power Gives Energy Security

How important is nuclear power going to be in India's future? Nobody knows for sure, since the future is full of uncertainties. But the nuclear option is a must for providing energy security.

Manmohan Singh thinks nuclear energy will be absolutely vital for India's energy future, and he might be right. His critics say nuclear power will never account for more than a fraction of India's power needs, and will be the most expensive form of power. They may be right too.

Today, the economic viability of nuclear power is far from proven. A detailed MIT analysis in 2003 suggested that nuclear power was distinctly more expensive than power based on coal or natural gas. But since then the prices of fossil fuels have gone through the roof. Many analysts fear that world oil production will soon peak, then plateau, and then decline inexorably. If so, oil will go over US\$500/barrel, and the prices of coal and natural gas prices will quadruple in tandem. That will make them very expensive for power generation.

Meanwhile, the nuclear power industry argues that economies of scale can substantially reduce the cost of nuclear power. Nuclear power plants have high upfront capital costs, but low running costs. If they are built without cost or time overruns, nuclear power could be competitive with natural gas even at today's prices.

In the '70s, nuclear plants in the US were plagued with huge delays and cost overruns. A third generation nuclear plant, currently being built in Finland, has run into similar problems. Yet, France, which gets three-quarters of its electricity from nuclear power, has shown that once production is standardised and plants are built on time, nuclear power is competitive. Fourth generation power plants are now on the drawing board, and could further improve the economics of nuclear power.

Coal is easily the cheapest option for energy. But coal-based power produces massive greenhouse gases, and for that reason may have to be curtailed in future decades. DV Kapur, former Power Secretary and Chief Executive Officer of National Thermal Power Corporation (NTPC), also points out that various expert committees have judged that India's extractable coal reserves may not last beyond four decades.

The 2006 Expert Committee on Energy estimated India's power needs at 960,000 MW by 2031-32, up from 144,000 MW today. This assumed a gross domestic product (GDP) growth rate of nine percent, which is very optimistic. But if indeed India grows so fast, coal, hydel and non-conventional energy sources will meet at best 75 percent of India's needs in 2030, and this proportion will keep declining as coal reserves deplete.

This, says Kapur, leaves an energy gap of 240,000 MW in 2031-32, which is far more than India's entire installed capacity today. Nuclear energy alone can fill this gap. The gap – and India's need for nuclear energy – will keep rising in future decades. Kapur makes a strong, apolitical case for nuclear power. So do Kalam and several top nuclear scientists. Yet, it is possible that breakthroughs in solar or other forms of energy could make them cheaper and more easily accessible than nuclear power. History shows that technology can change in radical, unpredictable ways.

I will be very happy if solar energy becomes the source of the future. It is available everywhere. It is renewable. It has none of the toxic, military or waste-disposal hazards of nuclear power. Recent advances in solar thermal technology show a lot of promise. Yet, nobody knows if the technology can be scaled up, work in cloudy countries, or overcome maintenance issues.

In sum, we face messy uncertainty today. Nuclear energy could be our only long-term saviour. But it could also be rendered irrelevant by the advance of solar or other energy sources. In such circumstances, we need to keep all options open, aim for a mix of energy sources, and try to be at the leading edge of all technologies. An important but little discussed part of the Indo-US nuclear deal is that it will enable India to participate in the international effort to develop fourth-generation nuclear power plants.

The Indo-US nuclear deal offers some immediate benefits. Existing nuclear power plants are running at half their rated capacity for want of fuel, and fuel imports will overcome the problem. Dual-use technologies will more easily be importable after the nuclear deal, greatly improving India's technological access. But it takes up to 10 years to build a green-field nuclear power plant, so the greatest benefits of a big nuclear push lie far out in the future.

The main case for nuclear power is a long-run one, to provide energy security. India needs to be at the cutting edge of this industry in case other power sources become unviable, making nuclear power absolutely essential. And to be at the cutting edge, India needs the Indo-US nuclear deal to end its technological isolation.

For conventional defence security, we maintain various options at considerable cost. For similar reasons, we need to push ahead with nuclear power, even if the immediate cost-benefit ratio is unclear. It is an essential energy security option for the long run.



### A History of Failed Power Policies and the Way Out

Every year, the Prime Minister calls meetings of chief ministers and an action plan and a 'new' power policy to overcome electricity shortages are framed. Then power takes a back seat till they happen again. There is no coordinated action plan, no systems and monitoring to ensure their timely and effective implementation, no accountability demands of inefficient and ineffective bureaucrats.

Look at our history of failed policies. In 1992, the Government fast-tracked power generation and opened it to private investment. Only one project was implemented by Enron. It built a combined cycle (naphtha and gas) plant at Dabhol. The costs were heavily padded and consequent tariffs unacceptably high. The plant was shut down. It remains unviable. Maharashtra reels under electricity shortages while over 2,000 MW of capacity at Dabhol lies unusable because of high tariffs. The failure is entirely that of Central and state government officials who approved the project costs. Perhaps they were anxious for a major foreign investment. Perhaps some officials received special incentives from Enron to approve the high costs (as implied by the Godbole committee).

In 1998, the Government opened transmission to private investment. This did not suit the Central Government transmission monopoly, the Power Grid Corporation that wanted to retain its pre-eminence. It stalled private transmission projects unless they were joint ventures with Power Grid. The government did nothing and private investment was prevented till recently, except in one joint-venture project. Transmission shortages continue. As a result, electricity trading has not taken off and we are unable to optimise our limited capacity.

The Electricity Regulatory Commission (ERC) Act was passed in 1998. The CERC and State Electricity Regulatory Commissions (SERCs) were formed. They have not been effective in implementing their mandates. Most SERCs have postponed tariff increases because governments were not in favour. They have done so by refusing legitimate expenses. They set targets for transmission and distribution loss reduction and metering without any base in empirical studies. Targets were not achieved. Distribution enterprises continue to lose money. State governments divert funds to pay and infrastructure and social expenditures suffer. The appointment of regulators was non-transparent. Formal and informal state government directives interfered with regulatory decisions. Decisions of state regulators showed a bias for state-owned enterprises (SoEs).

In 2000, the Centre introduced the innovative accelerated power development reform programme. It helped marginally in some states in reducing losses. The lack of Government support, a disinterest among regulators in details of action plans for achieving targets, lack of monitoring over the year of the actions, poor administration and a lack of accountability in the absence of penalties for non-performance was largely responsible.

In 2002, Delhi privatised distribution. The scheme had inbuilt financial support from the state. This support was to come from the savings from electricity distribution by private companies. A lack of support from the Union Government and the political leadership for privatisation almost certainly stopped actions by other states on distribution privatisation. Privatisation has changed the distribution situation in Orissa and Delhi. But a Congress-led Centre could not support the actions of a Congress Government in Delhi. Central support to privatising in non-Congress ruled states is more unlikely.

A major initiative of the innovative Power Minister, P Rangarajan Kumaramangalam, the Electricity Act, 2003 has had limited impact. Many key provisions remain poorly implemented, if at all, by state regulators and state governments. Meanwhile, we continue to lament the state of the power sector as we did when in 1998 I was appointed the first chairman of the CERC. The slow Indian administrative system, a total absence of political leadership of all parties on reducing subsidies and improving efficiencies, the absence of a commercial and enterprise culture in state-owned distribution entities, prevent progress.

The principal bottlenecks to transformation are supply shortages; over-dependence on coal; the lack of accountability of independent regulators and their hesitation in ruling contrary to political winds; rising costs of fuels and consumers' unwillingness to pay the costs of servicing these; the financial weakness of government-owned distribution entities; lack of political consensus; government ownership of most distribution networks; limited privatisation initiatives; weak state administrations; and, crucially, power as a concurrent subject of the Centre and states.

### **How can we get out of this mess?**

Coal must be released entirely from Government ownership and bureaucratic management. The proposed allocation of captive coal mines to large-generation plants will remove this bottleneck. But new estimates show our coal reserves lasting for only 25 years. So we will need to import a great part of our requirements of fuels, oil, gas, uranium and coal. This demands a coordinated approach to energy security.

Regulation of all fuel tariffs (coal and gas) should be with the same regulator as for power so that all costs can be scrutinised, adequate returns ensured, and the consumer is not made to pay extortionate prices for the fuels.

The Government has inconsistent policies. It is allocating captive mines to the ultra mega-power projects, thus enabling much lower electricity tariffs. But with gas, much of whose reserves are operated by the private sector, the Government prefers to allow the lessors to make windfall profits in line with international prices. Gas as an alternative fuel to coal for electricity generation should be treated on a par with it. It is not.

Gas prices for power should be linked with other fuel costs. Gas is a national resource and big private profits lead to high power tariffs for consumers. Gas exploration and production risks deserve higher returns. A common regulator should ensure them, but not permit windfall profits from volatile world prices.

There is talk of members and chairpersons of regulatory commissions being remunerated well. But selections must be open and not just limited to retiring government employees. They should be made accountable to legislative committees.

The Centre should use incentives to get the states to implement the Electricity Act. All demand forecasting should take demand elasticity, because of declining thefts, and subsidies into account. Forecasts should be futuristic, not based on past low economic growth, building a spinning reserve of at least five per cent of capacity. Rising incentives for open access with low surcharge, widespread metering, rationalizing of subsidies, distancing from regulators and electricity distribution enterprises and incentivising captive generation must be pursued through the Accelerated Power Reforms and Development Programme (APRDP).

State governments must distance their administration of power from management of power enterprises. These must be restructured to have a commercial approach. State governments should separate ownership from management by privatising distribution, based on the realistic Delhi model.

The Union Government must ensure that its policies are not subverted by public sector enterprises. It must ensure coordination among the ministries of coal, gas, power, renewable, environment and forests, finance and railways, and also help in speedy clearance of environmental issues. The Centre should develop alternatives for the precise targeting of beneficiaries of cheap or free electricity. States must be penalised if they do not do so. Funds must not be wasted on those outside the target populations. Incentives for renewable energy use must be for electricity generated, not for mere construction of the plant as is the case today with wind.

Above all, we need a political consensus among all parties so that the issue of power does not remain a game of political football.



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