Investment Opportunities in Indian Power Sector and Cooperation with International Energy Agency

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Outline of the Presentation:

I. Strengths of Indian Economy

Investment climate in India is buoyant and various macro-economic parameter are reflecting that pace of growth of the economy has accelerated and macro- economic fundamentals are sound and moving towards right direction.

- India has been able to achieve an economic growth rate of 8% per annum during last few years and is poised to achieve double digit growth rate.
- Industrial growth rate has been recorded over 9% consistently in last few years.
- Domestic saving rates have been rising a reached over 29%.
- Inflation rate has been moderate despite the sharp hike in International oil prices.
- The current account deficit is around 1.3% of the GDP and reflects the revival of investment and also the impact of oil prices, but a deficit of this order is very much financeable.
- Foreign exchange reserves are at a very comfortable label of about $170 billion.

II. Key Energy indicators:

Sl.No	Indicator	India	World
1.	TPES (Mtoe)	572.85	11223
2.	TPES Per Captia (Toe)	0.53	1.77
3.	TPES /GDP (PPP)	0.18	0.21
4.	Electricity Consumption Per Capita (kWh)	457	2516
5.	CO_2 / TPES (Tone CO_2 /Toe)	1.93	2.37
6.	CO_2 Per Capita	1.02	4.18

Source IEA: Key world Energy Statistics 2006.

Paper Presented in the IEA Governing Board Meeting at Sydney

III. Strengths of Indian Power Sector

III.1 During the period 2007-12 average economic growth rate has been projected at 9% per annum. To sustain this economic growth power sector has also to grow by 9%.

III.2 To cater to the needs of economy growing at the average rate of 9%, providing reliable, affordable, secure and sustainable energy, possible options include maximizing domestic production, diversifying the fuel mix and the source of supply and maintaining sufficient reserves. This will ensure price stability as also security of supply in the energy sector. Fluctuations in the delivery price of the energy have cascading effect on the growth process itself. In the long term perspective for fueling the likely installed capacity of 800 MW by 2031-32, coal is to remain mainstay in the overall fuel mix for power generation in the country.

III.3 To revamp the Power Sector, number of path breaking initiative have been taken in the recent past, both in terms of policy pronouncements and programmes ranging from bringing about efficiency in generation segment through introduction of super critical technology to penetration of commercial energy in the rural areas and consolidation of electricity delivery system.

IV. Energy Strategy

- Full development of hydro potential. Hydro power irrespective of size, renewable source of energy.
- Domestic coal to remain primary source. Emphasis on Super Critical Plants and Clean Coal Technologies.
- Import of coal on moderate scale for coastal locations.
- Use of gas dependent on availability and price.
- Import of gas – LNG terminals. Gas pipelines from Western and Central Asia.

V. RECENT POLICY INITIATIVES

V.1 Comprehensive Legislation

- Electricity Act, 2003 is an historic legislation, which not only integrates the previous three Acts, but goes beyond in trying to create a competitive environment.
- Consumer is the central point of this legislation and the main features are:
  - Promoting competition for benefit of the consumers.
  - Effective mechanism for redressal of consumers' grievances
  - Regulatory oversight for transparency
  - Measures to control theft of power
  - Special measures for power in rural areas
- **Facilitates Investment by creating competitive Environment**
  - Entry Barriers removed/reduced
  - Generation delicensed.
  - Freedom to captive generation including group captive.
  - Recognizing trading as an independent activity.
  - Open access in transmission already in place.
  - Open access to consumers above 1 MW within five years commencing from 27th January, 2004 (date of enforcement of amendment of Electricity Act).
  - Multiple licenses in distribution.
  - Regulatory Commissions – to develop market; fix tariff.

V.2 Electricity Policy

- This is the main instrument through which the legislative provisions under the Electricity Act have to be administered and implemented. It aims at:
  - Access to all by year 2009
  - Eliminating power shortages by year 2012
  - Protection of consumer interests
  - Financial turnaround of power utilities

V.3 Tariff Policy

- Another very important policy initiative, which was needed to be put in place to give effect to the Electricity Act, was the Tariff Policy which was notified in January, 2006.
- This policy aims at:
  - Reducing the cost of power through competitive process of capacity development.
  - Operationalising Open Access in Transmission and Distribution.
  - A clear-cut policy on management of subsidy and cross-subsidy encouraging renewable energy sources of generation.
  - A clear-cut direction on optimum utilization of captive plant capacity.
  - In nut-shell, Tariff Policy aims at ensuring that the consumers interests are protected in the best possible manner.

V.4 Tariff Based Competitive Bidding

- The next policy instrument put in place, is comprehensive guidelines on competitive bidding for power project development. This was notified in January, 2005.
- The main objective of the competitive bidding guidelines is to see that the distribution companies get electricity at best possible price and thereby consumers get electricity at optimal tariff. This also aims at a transparent process of selection of project development.
- Similar dispensation in Transmission segment was also extended and comprehensive guidelines were issued in May 2006.

VI. POSITIVE RESPONSES

- Growth in electricity generation during Ninth Plan was 3% per annum. During last three years growth in electricity generation has been consistently above 5%. During April to October, 2005 growth rate recorded was 5.2%, against this during the same period in 2006-07 growth in generation has been 7.3%.
- The Plant Load Factor (PLF) is an important measure of operational efficiency of thermal power plants. The PLF of the overall system has improved significantly

from 64.6% in 1998-99 to 75 % now. Thus, implying a secular improvement in efficiency in generation.

- Inter regional connectivity has been planned with hybrid system consisting of HVDC, Ultra high voltage AC (765KV) and Extra high voltage AC (400KV) lines. The present Inter Regional capacity is 11,500 MW and projects in hand indicate that this capacity would be enhanced to 30,000 MW by 2012.
- There has been a revival of interest in generation following the enactment of the Electricity Act. Provisions for open access have effectively taken care of concern of developers regarding payment security as it enable them to find alternative consumers across India who would be prepared to pay for the electricity in case their tariffs were competitive.
- Payment by electricity utilities whether in public / private sector to generation or transmission companies is no longer a concern any more. In last four years 100% payment of bills is being ensured by district utilities all over the country.
- The distribution reforms have remained the key focus area for quite some time now. A number of measures have been taken to improve financial health of State Utilities. These measures have shown positive results. The losses of State Utilities have come down to US $ 4.6 billion during 2003-04 from US$ 6.2 billion in 2001-02. The gap between cost of supply and revenue is also showing a declining trend. State Utilities have liquidated all their past dues and are regularly paying the current dues. The creditworthiness of Indian power sector has considerably improved.
- Electricity market in the country is buoyant. There has been quantum increase in the investment in the power sector. At present projects aggregating over 43,000 MW with total committed investment of above $50 Billion are under execution. Majority of them would be commissioned in next 3 years.
- As a positive consequence of Electricity Act, capacity addition through Captive route has picked up significantly. Recently over 4000 MW has been added through this route.
- Over 7,000 MW of IPPs have achieved financial closure after the Electricity Act came into force and another 9,000 MW is in the pipeline.
- Reorganizing the fact that economies of scale leading to cheaper power could be secured through large size power projects and for introducing the efficient super

critical technology in a big way, a unique initiative has been launched for development of Ultra Mega Power Projects under tariff based international competitive bidding route. 9 sites for development of 4000 MW project each have been identified so far and the first two sites would be handed over to the successful bidder by December end 2006. The investment requirement of each of the project has been worked out to be $ 3.5 Billion.

- Open Access in transmission has become a reality. Real fillip to this process would be given through the development of Merchant Plants, which will be in the ultimate benefit of consumers.
- Open Access in distribution is mandated to happen latest by 2009. All regulatory commissions have worked out the rules and for consumers of 1 MW and above, this process would be taking off in the next 2-3 years time frame. This will, however, take some time to stabilize. Even in UK, it took almost more than 10 years for the process to deliver results to a significant level. We could expect same time frame for open access in distribution to be a reality to a significant level of supply of power to larger consumers and also to other consumers.
- Scheme of development of Merchant Power plants in the country has been to provide the additional generating reserves that India needs now and will need in the future. They are a modern, market-based answer – at least in part – to energy challenges faced by the country.
- It is expected that developers would respond to this initiative of Ministry of Power and would make efforts to develop power plants which will have highly competitive tariff. This would be one of the major inputs in creating and developing competitive electricity market in coming years. This step is aimed at catalyzing this process and accelerating the pace of development of merchant power plants.

VII. Development of Alternate Source of Energy

- Emphasis on Biomass.
- Wind power potential – success story for rapid development. More than 3800 MW added in the last four years.
- At over 5500 MW, Wind capacity 4th largest in the world.
- Development of Mini and Micro hydro electric projects

- Solar power needs intensive R&D for cost reduction . Extensive development of solar dependent on CDM benefits to offset present high cost.
- Nuclear power presently 3,900 MW- Share of Nuclear power to be enhanced. No CO2 emissions.
- Mastery in fuel cycle and technology.
- Fuel Constraint.
- Rapid increase in share of nuclear power dependent on International Cooperation

VIII. Low Energy Intensity and Low Carbon Path of Development

	Energy Intensity TPES/GDP (KgOE/2000PPP$)	Per Capita CO2 Emissions (Tonnes/capita)
India	**0.18**	**1.02**
China	**0.23**	**3.66**
USA	**0.22**	**19.73**
OECD	**0.19**	**11.09**

IX. India IEA Cooperation

The Ministry of Power had signed an MOU with the International Energy Agency in April, 1998 for cooperation in the power sector. India is one of the few non-member countries of the IEA and cooperation focuses on following key areas:

- Energy Information and Statistics
- Energy supply security
- Energy efficiency
- Energy and Environment

- Energy pricing etc.

There has been close inter-action with IEA, India since then, India-IEA have jointly organized a number of events jointly. These include workshop on Coal and Electricity held at New Delhi in September, 2003, Workshop on Standard and Labeling held at Bangalore in October, 2004 This event proved very popular with stakeholders and paved the way for Indo-IEA collaboration on energy efficiency and conservation. Recently, Workshop on energy efficiency and building codes was organised at New Delhi in 2006.

In addition, IEA has a Greenhouse Gas R&D Programme which operates from London. India is participating in this Programme and NTPC has been nominated as Nodal Agency for representing India in the Programme. It has been decided that CEA and TERI will be associated in this programme and representatives of all these three organizations will participate in the meetings of this programme.

The IEA Demand Side Management Programme is an international collaboration with 17 IEA Member Countries and the European Commission working to clarify and promote opportunities for Demand Side Management. India is participating in the IEA DSM Implementing Agreement and Bureau of Energy Efficiency (BEE) has been nominated as the Nodal Agency for representing India in this programme. BEE, as the Nodal Agency, will sign an agreement with the IEA-DSM for participation of India in this programme.

Strengthening India-IEA Cooperation

India –IEA Cooperation has proved to be mutually beneficial. The IEA is an organization established with a primary function to advise the OECD countries on Energy related matters. It is an important forum in the developed world and India stands to gain through its association as it gets an opportunity to project its policies and programmes before the developed world. India is one of the non – member countries of the IEA and IEA considers India as a fast emerging economy that would eventually become one of the largest energy users of energy in the years to come.

Since the signing of MoU as detailed above, a number of events/ training programs have been jointly organized. In the process India has also decided to join two of the IEA's major conventions, i.e., Greenhouse Gas R&D programme and IEA – DSM. India could consider joining some of the other useful conventions in future.

The Roadmap for the future cooperation is mainly to come in the areas which, interalia, include:

a. Energy efficiency and Demand Side Management.
b. Data Management, mismatch in the Demand supply projections and evolving assessment methodology for computing Energy Balance.
c. India and IEA have worked together to jointly put the case across for treatment of Hydro power project, irrespective of size as renewables. In this direction further cooperation is required to be made for treating all Hydro projects eligible for benefits under CDM.
d. Despite the recognition that gas is an environmentally benign source of energy, its availability at the right price has been the key issue which has acted as deterrent for the power sector setting up ambitious gas based power projects. To track the developments in the international gas markets it is imperative that IEA should brig out various scenarios and projections for availability of gas.
e. IEA may work out Capital cost benchmarks for various power projects.
f. Long term projections for Nuclear fuel availability and prices.

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