FOREIGN DIRECT INVESTMENT IN NON-CONVENTIONAL ENERGY IN INDIA

DISSERTATION SUBMITTED IN PARTIAL FULFILMENT FOR THE AWARD OF THE DEGREE OF MASTER OF LAWS

UNDER THE GUIDANCE OF

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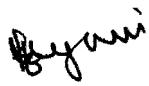
DECLARATION

This dissertation titled *"Foreign Direct Investment in Non-conventional Energy in India"* is hereby submitted in partial fulfilment of my LLM Degree in Business Laws in this institution.

I do declare that the dissertation is a result of legitimate research carried out by me under the supervision and guidance of Prof. Dr. N.L.Mitra, Prof.of Law National Law School of India University, Bangalore.

I further declare that any reference in this paper is duly acknowledged.



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CERTIFICATE

This is to certify that this dissertation on *"Foreign Direct Investment in Non-conventional Energy in India"* submitted by Sayeeswari R, ID NO - 289, for the degree of Maters of Law for the session 2007-2009 of the National Law School of India University, Bangalore is the product Bonafide research carried out under my supervision and guidance. This dissertation or any part thereof has not submitted elsewhere for any other degree.

Date....30.05.09

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1.1. INDIA- A LAND OF INFINITE OPPORTUNITIES

For time immemorial India has been known for its diverse culture, for the accommodating people and for the ease of its topography. Today, the world's largest democracy has come to the vanguard as a universal resource for the manufacturing and services industry. Its pool of technical skills, its base of an English-speaking populace with an increasing disposable income and its burgeoning market have all combined to enable India emerge as a viable partner to global industry[1].

India is the 10th largest industrialized country with the emerging markets tag.[2] It has embarked upon ambitious programme of economic reforms to unshackle the economy from Government controls, which will help in exploiting its rich resources and realizing its incredible potential. It is widely accepted that India has the potential to achieve economic growth, higher than the growth accomplished by recently industrialized countries in the Asia Pacific region.[3] The economy has registered an average growth rate of more than 7 per cent since 1997, sinking poverty by about 10 per cent. India realized 8.5 per cent GDP growth in 2006, and again in 2007, considerably augmenting its gross

[1] Manual of investment commission of India, Investment Commission of India, New Delhi. available at www.investmentcommission.in

[2] http://en.wikipedia.org/wiki/Emerging_markets

[3] Nabhi's manual for Foreign collaboration investment in India, 6th edition, Nabhi publications, New Delhi, 1995

production.[4] India has undergone a paradigm shift owing to its competitive stand in the world. The Indian economy is on a robust growth trajectory and boasts of a steady annual growth rate, rising foreign exchange reserves and booming capital markets among others.[5]

India tenders investment opportunities in excess of US$850 billion in varied sectors over the next five years.[6] Being a democracy ensures a secure policy environment and its independent institutions guarantee the rule of law. This extremely diversified economy has shown rapid growth and remarkable resilience since 1991, when economic reforms were set off with the progressive opening of the economy to international trade and investment.[7] While its size and growth potential make India striking as a market, the most compelling reason for investors to be in India is that it provides a lofty return on investment. India is a free-market democracy with a legal and regulatory framework that remunerates free enterprise, entrepreneurship and risk taking.[8] The industrial policy of India offers a great deal of freedom to business houses and entrepreneurs to make their own investment choice. India has undergone more than a decade of economic reforms. The continuity in the economic liberalization process and the political consensus that economic change is imperative continues to encourage the industrial growth path in India.

1.2. ENERGY SECTOR IN INDIA:

[4] http://ibef.org/artdispview.aspx?art_id=22175&cat_id=584&in=35

[5] http://www.indiainbusiness.nic.in/whyindia.htm

[6] http://www.pppinindia.com/india.asp

[7] *Ibid.*

[8] *Ibid.*

Energy is vital for survival on earth. Availability and access to energy are considered as catalysts for economic growth. There is a strong mutual relationship between economic development and energy consumption. On one hand, growth of an economy, with its global competitiveness, hinges on the availability of cost-effective and environmentally benign energy sources, and on the other hand, the level of economic development has been observed to be reliant on the energy demand.[9]

India is both a major energy producer and a consumer. India currently ranks as the world's seventh largest energy producer, accounting for about 2.49% of the world's total annual energy production. It is also the world's fifth largest energy consumer, accounting for about 3.45% of the world's total annual energy consumption in 2004[10]. Since independence, the country has seen significant expansion in the total energy use in the country with a shift from non-commercial to commercial sources. The share of commercial energy in total primary energy consumption rose from 59.7% in 1980–81 to 72.6% in 2006–07. It must be noted, however, that India's per capita energy consumption is one of the lowest in the world. India consumed 455 kilogram of oil equivalent (kgoe) per person of primary energy in 2004, which is around 26% of world average of 1750 kgoe in that year. As compared to this, per capita energy consumption in China and Brazil was 1147 kgoe and 1232 kgoe, respectively.[11]

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[9] Indian energy sector: an overview available at http://www.indiaenergyportal.org/overview_detail.php

[10] 11th five year plan, Planning commission http://planningcommission.nic.in/plans/planrel/fiveyr/11th/11_v3/11v3_ch10.pdf

[11] *ibid.*

India is well-endowed with both exhaustible and renewable energy resources. Coal, oil, and natural gas are the three primary commercial energy sources. India's energy policy, till the end of the 1980s, was principally based on availability of indigenous resources. Coal was by far the largest source of energy. However, India's primary energy mix has been changing over a period of time[12].

Despite increasing dependency on commercial fuels, a sizeable quantum of energy requirements (40% of total energy requirement), especially in the rural household sector, is met by non-commercial energy sources, which include fuelwood, crop residue, and animal waste, including human and draught animal power. However, other forms of commercial energy of a much higher class and efficiency are steadily replacing the traditional energy resources being consumed in the rural sector.[13]

Projections made in the Integrated Energy Policy Report[14] reveal that to achieve its development goals, India would need to rely increasingly on imported oil, gas, and coal in the medium term. Against this backdrop, the role of new and renewable energy assumes added significance, irrespective of whether it replaces coal or oil. In this regard, IEPR[15] recognizes 'the need to maximally develop domestic supply options as well as the need to diversify energy sources . . .', although renewables are likely to account for only around 5%–6% of the primary commercial energy-mix by the year 2032. Continuing

[12] *ibid.*

[13] *ibid.*

[14] Integrated Energy Policy Report, 2008 Available at http://www.energy.ca.gov/2008_energypolicy/index.html

[15] *ibid.*

to sustain the growth of new and renewable energy is in the country's long-term interest, even though in the medium term this option might materialize somewhat costlier. Thus, a balanced approach for new and renewable energy that factors in the need to develop domestic and renewable sources of energy has to be adopted.

1.3. NON CONVENTIONAL ENERGY IN INDIA

India's search for new and renewable energy resources that would ensure sustainable development and energy security began in early 70's of the last century. Consequently, use of various renewable energy resources and efficient use of energy were recognized as the two thrust areas of the sustainable development. Realising the need for intense efforts in this sector, the Government of India established a Commission for Additional Sources of Energy (CASE) in the Department of Science and Technology, in 1981. The mandate of CASE is to promote research and development activities in the field of renewable energy. CASE was formally incorporated in 1982, in the newly created Department of Non-conventional Energy Sources (DNES). In 1992 DNES became the Ministry for Non-conventional Energy Sources, commonly known as MNES.The Ministry continues to support the implementation of a large wide-ranging programme covering the entire range of new and renewable energies. The Ministry has Regional Offices, three specialised research Institutions and a non-banking financial company – Indian Renewable Energy Development Agency (IREDA) - under its administrative control to promote its policy and programme initiatives.

1.4. FDI IN INDIA

Ever since India gained Independence, the nation's economic development programs have struggled to achieve economic self-reliance and social equity. Extended reforms in almost every sector have guaranteed macro-economic stabilization in the country. With the economy evidently charting the course of global integration and international competitiveness over the last decade, there has been substantial flow of Foreign Direct Investment in various core sectors of the economy.

FDI has gained importance globally as an instrument of international economic integration. FDI policies along with trade policies have, in fact, become the focus of liberalization efforts in almost every country. In India, the primary objective of the FDI policy is to invite and aid foreign investment to achieve faster economic growth. The policy guidelines of the Government of India for FDI in India are reviewed on an ongoing basis taking into account the economic requirements of the country. The regulations have been structured to identify the industrial sectors, with or without sectoral caps, for investments, to reduce the procedural formalities and finally to introduce an automatic route for foreign investors to bring in investment by merely informing the Reserve Bank of India.[16]

Under the FDI policy, the original investment, as also the returns thereon, are fully repatriable. The payment of lump-sum fee and royalty to foreign technology provider, including that by a fully owned subsidiary to its offshore parent company, is now permitted.[17]

The Indian capital market is now open to Foreign Institutional Investors. Indian companies are permitted to raise funds from international capital

[16] Investing in India, Regulations and incentives, FML, Delhi, 2007

[17] *ibid.*

markets. India has entered into agreements for the avoidance of double taxation with over 83 countries (including limited DTAA's with 9 countries) in addition to signing bilateral investment protection agreements with over 50 countries.[18] Special investment and tax incentives are given for exports. Certain sectors such as power, electronics and software are also extended these benefits qua these sectors. "Single window" clearance facilities and "investor escort services" have also been provided in various States in order to simplify the approval process for new ventures. India has also entered into bilateral investment treaties which are the agreements between two countries for the reciprocal encouragement, promotion and protection of investment in each other's territories by companies based in either country.[19]

Chapterisation

Chapter1: Introduction--Energy sector in India- current trends

- throws light on emerging status of Indian energy sector in the global set up through the foreign direct investments taking place.

Chapter2: Green power

- Deals with various forms of non conventional energy and their benefits.

Chapter 3: Nuclear power

-Details on the Nuclear power programme in India and the scope of Atomic power in the future.

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[18] *ibid.*

[19] *ibid.*

Chapter4: Regulatory framework for power projects in India.

-Deals with the regulators, the policiy initiatives and the law relating to power, Non conventional energy and FDI in India.

Chapter5: FDI in non conventional energy

- Various approvals necessary for a non conventional energy project- entire process of FDI flowing into Indian energy market and legal mechanisms and necessary fulfillments involved.

Chapter6: Incentives India

- Explains the initiatives given in India to attract investments in Non conventional Energy

Chapter7: Conclusion

CHAPTER 2- GREEN POWER-RENEWABLE ENERGY IN SOURCES INDIA

'Promoting freedom from Fossil Fuels...but the time is running out...soon, there will be nothing left to burn on the earth but earth itself'.[20]

2.1. PREDICTIONS REGARDING CONVENTIONAL SOURCES OF ENERGY

Fossil fuels supply most of the energy consumed today. They are relatively concentrated and pure energy sources and technically easy to exploit, and provide cheap energy. Presently oil 40%, natural gas 22.5%, coal 23.3%, hydroelectric 7.0%, nuclear 6.5%, biomass and others 0.7% provide almost all of the world's energy requirements[21]. While fossil fuels and hydro-electricity will continue to play a dominant role in the energy scenario in India in the next few decades, conventional energy resources such as coal, oil, and natural gas are limited and non-renewable. Also, fossil fuels need to be used prudently on account of being environmentally harmful. On the other hand, renewable energy resources are indigenous, non-polluting and virtually inexhaustible.[22]

2.2. RENEWABLE ENERGY IN INDIA

In India with additions to installed capacity, total generation by public utilities increased rapidly, from 5106 GWh in 1950 to 264,231 GWh in 1990/91,

[20] The official website of Indian Renewable Energy Development Agency carries this message on the home page. Available at http://www.ireda.nic.in

[21] *Supra* Note 1

[22] *ibid.*

registering an annual growth rate of 10.4 % over this period.[23] Until the 1980s the growth rate in hydro and thermal generation was comparable, but during the 1980s, hydro generation was comparable, but during the 1980s, hydro generation increased at a rate of only 4.4% compared to a growth rate of 11.6 % in thermal generation.[24] Since thermal generation is based on burning coal or oil, increases in CO2 emissions, which injure the atmosphere and affect global warming, accompany this growth. Since the 1980's, and still currently, India has encountered a negative balance in overall energy consumption and production. This has resulted in the need to purchase energy from outside the country to supply and fulfill the needs of the entire country. As we will demonstrate later, the Government is more sensitive to renewable energy potential and has started to put reforms and projects, incentives and legislation in place to convince investors and companies to make the shift.

The developed nations have contributed a greater share of the emissions of carbondioxide, leading to global warming. But the current trends in the developing nations are very alarming and, if unchecked, developing countries will contribute half of the annual greenhouse gases. This calls for urgent measures for minimising, if not replacing, the reliance on fossil fuels to meet the increasing energy requirements. It is for this reason that the non-conventional renewable sources of energy have caught the attention of many.[25]

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[23] Global Energy Network Institute, Overview of Renewable Energy Potential of India, Available at *www.geni.org/*

[24] *ibid.*

[25] *ibid.*

Renewable energy sources are indigenous and can contribute towards reduction in dependency on fossil fuels. Non conventional energy sources assume special significance in India when viewed in the context of the geographic diversity and size of the country, not to mention the size of its rural economy. Since renewable energy resources are diffused and decentralised, they are more appropriate as local energy systems to meet the ever expanding and diversified energy needs. In this perspective, they offer numerous possibilities for meeting the basic energy needs of the rural poor. This apart, renewable energy offers significant possibilities for job creation. Such jobs would also help arrest rural to urban migration.

Renewable energy also provides national energy security at a time when decreasing global reserves of fossil fuels threatens the long-term sustainability of the Indian economy. The energy security is an issue not only at the national level but also at the local level. This means that a remote hamlet or village will not need to depend on mostly erratic energy supply from far flung areas but will be in a position to meet its own demands through indigenous energy resources. The use of such technologies, which on the one hand enable users to use traditional fuel more efficiently and on the other hand utilize locally appropriate renewable energy resources provides a certain level of energy security to these users.[26]

Globally Nations are more concentrating on Renewable Energy. An examination of India's primary energy balance shows that renewables account for about 32% of primary energy consumption in 2003-04[27].

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[26] *ibid.*

[27] Bhat, Dimple shahi, India power projects regulation, policy and finance, 1998

2.3. RENEWABLE ENERGY SOURCES

A natural resource qualifies as a renewable resource if it is refilled by natural processes at a rate comparable or faster than its rate of consumption by humans or other users. Solar radiation, tides, winds and hydroelectricity are perpetual resources that are in no danger of long-term availability. Renewable resources may also mean commodities such as wood, paper, and leather.

The following are the commonly recognised forms of Renewable Energy in India:

a. Solar Energy
b. Wind energy
c. Bio mass
d. Other sources

a. Solar Energy

Solar power is the technology of obtaining usable energy from the light of the sun. Solar energy has been used in many conventional technologies for centuries, and has come into widespread use where other power supplies are lacking, such as in remote locations and in space[28].

Indirectly, the sun is responsible for all our energy. Plants use the sun's light to make food, animals eat plants for food, decaying plants hundreds of millions of years ago produced the coal, oil and natural gas that we use today. So, fossil fuels is actually sunlight stored millions and millions of years ago.

Solar energy can be used in a number of applications including

[28] Solar energy info kit 2008, Available at http://www.terienvis.nic.in/enrg-solar.htm

- Heat (hot water, building heat, cooking)
- Electricity generation (photovoltaics, heat engines)
- Desalination of seawater
- Plant's lifecycle

Solar heating is to capture or concentrate sun's energy for heating buildings and for cooking or heating food stuffs etc. Solar electricity is mainly produced by using photovoltaic solar cells which are made of semi- conducting materials that directly convert sunlight in to electricity.

India is a vast country with an area of over 3.2 million sq. Km. Because of its location between the Tropic of Cancer and the Equator, India has an average annual temperature that ranges from 25°C – 27.5 °C. This means that India has huge solar potential. The sunniest parts are situated in the south/east coast, from Calcutta to Chennai.[29]

b. Wind Energy

Wind is the natural movement of air across the land or sea. Wind is caused by uneven heating and cooling of the earth's surface and by the earth's rotation. Land and water areas absorb and release different amount of heat received from the sun. As warm air rises, cooler air rushes in to take its place, causing local winds. The rotation of the earth changes the direction of the flow of air. Kinetic energy in the wind can be used to run wind turbines, but the output depends upon the speed of the wind. Turbines generally require a wind in the range 5.5. m/s (20 Km/h)[30].

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[29] *ibid.*

[30] *supra* Note 2

India now has the 5th largest installed capacity, of 9755.85 MW, in the world.[31]

Cumulative power generation from wind energy projects

Year	Cumulative power generation capacity (MW)	Annual growth (%)
1996-97	823.62	--
1997-98	968.48	17.58
1998-99	991.98	2.42
1999-2000	1080.81	8.95
2000-01	--	--
2001-02	1507.30	39.46
2002-03	1702.00	12.91
2003-04	2483.00	45.88
2004-05	2980.00	20.01
2005-06	4433.90	48.75
2006-07	6315.00	42.45

Source: MNRE, Govt of India [32]

Benefits of Wind Energy

[31] http://mnes.nic.in/

[32] Available at http://www.terienvis.nic.in/stat_table/stat_tab.htm#3_8

- Reduces climate change and other environmental pollution
- Wind energy can be utilized as a shield against ever increasing power prices. The cost per kwh reduces over a period of time as against rising cost for conventional power projects.
- Diversifies
- energy supply, eliminates imported fuels, provides a hedge against the price volatility of fossil fuels. Thereby provides energy security and prevention of conflict over natural resources
- One of the cheapest source of electrical energy.
- Least equity participation required, as well as low cost debt is easily available to wind energy projects.
- A project with the fastest payback period.
- A real fast track power project, with the lowest gestation period; and a modular concept.
- Operation and Maintenance (O&M) costs are low.
- No marketing risks, as the product is electrical energy.
- Creates employment, regional growth and innovation
- Reduces poverty through improved energy access
- Fuel source is free, abundant and inexhaustible
- Delivers utility-scale power supply

In India, the wind power potential has been estimated at 45000MW[33]. Experts consider that the technological advances in recent years in the field and the availability of sophisticated equipments would facilitate the country in

[33] Wind Energy Information, Published by Envis Centre on Renewable energy and Environment Available at http://www.terienvis.nic.in/enrg-wind.htm

achieving the target in future years. Power generation from wind in India has emerged as a successful programme, making a meaningful contribution to bridging the gap between the supply and demand for power. The present installed capacity of 1 080MW of wind power represents a little more than 1% of the total installed capacity in the country.[34] As such, 860MW of wind power capacity was added during the Eighth Plan period as against the initial target of 100MW and the revised target of 500MW[35]. More than 5 billion units of electricity have been generated and fed to the utility by wind power projects[36]. Potential windy locations have been identified in the flat coastal terrain of southern Tamil Nadu, Kerala, Gujarat, Lakshadweep, Andaman & Nicobar Islands, Orissa and Maharashtra. Favourable sites have also been identified in some inland areas of Karnataka, Andhra Pradesh, Madhya Pradesh, West Bengal, Uttar Pradesh and Rajasthan. Locations having an annual mean wind power density greater than 150 watts per sq metre at 30 metre height will be considered suitable for wind power projects[37]. There are 177 locations identified so far with an aggregate potential capacity of about 5500 MW in 13 states[38].

c. Biomass

Biomass (organic matter) can be used as a fuel, and to generate electricity, both called forms of bioenergy. Wood, the largest source of bioenergy, has been used to provide heat for thousands of years. However, there are many

[34] http://www.terienvis.nic.in/enrg-wind.htm

[35] *ibid.*

[36] *ibid.*

[37] *ibid.*

[38] *ibid.*

other sources of biomass such as plants, residue from agriculture or forestry, and the organic component of municipal and industrial waste that are used today as sources of energy. Today, many bioenergy resources are replenished through the cultivation of energy crops, such as fast-growing trees and grasses, called bioenergy feedstocks.

Unlike other renewable energy sources, biomass can be converted directly into liquid fuels for our transportation needs. The two most common biofuels are ethanol and biodiesel. Ethanol, an alcohol, is made by fermenting any biomass high in carbohydrates such as corn, through a process similar to that used in brewing beer. It is used mostly as a fuel additive to cut down a vehicle's carbon monoxide and other smog-causing emissions. Biodiesel, an ester, is made using vegetable oils, animal fats, algae, or even recycled cooking grease. It can be used as a diesel additive to reduce vehicular emissions or in its pure form to fuel a vehicle.

Heat can be used to chemically convert biomass into a fuel oil, which can be burned like petroleum to generate electricity. Biomass can also be burned directly to produce steam for electricity production or manufacturing processes. In a power plant, a turbine usually captures the steam, and a generator then converts it into electricity. In the lumber and paper industries, wood scraps are sometimes directly fed into boilers to produce steam for their manufacturing processes or to heat their buildings. Some coal-fired power plants use biomass as a supplementary energy source in high-efficiency boilers to significantly reduce emissions.

Even gas can be produced from biomass for generating electricity. Gasification systems at high temperatures are used to convert biomass into a gas (a mixture of hydrogen, carbon monoxide, and methane). The gas fuels a turbine, which is very much like a jet engine, only it turns an electric generator instead of propelling a jet. The decay of biomass in landfills also produces a gas-methane-that can be burned in a boiler to produce steam for electricity generation or for industrial processes.

Cumulative power generation from biomass energy

Year	**Cumulative power generation capacity (MW)**	**Annual growth (%)**
1996-97	69.5	--
1997-98	119.50	71.94
1998-99	141.00	17.99
1999-2000	222.00	57.44
2000-01	--	--
2001-02	358.00	61.26
2002-03	468.00	30.72
2003-04	613.00	30.98
2004-05	727.00	18.59

2006-07	1146.30	32.13

Source: TEDDY, 2002/03 and MNES, Govt of India[39]

India is very rich in biomass. It has a potential of 19,500 MW (3,500 MW from bagasse based cogeneration and 16,000 MW from surplus biomass). Currently, India has 537 MW commissioned and 536 MW under construction[40]. The facts reinforce the idea of a commitment by India to develop these resources of power production.

d. Other Sources

The other sources of renewable energy are geothermal, ocean, hydrogen and fuel cells. These have immense energy potential, though tapping this potential for power generation and other applications calls for development of suitable technologies.

i. Geo thermal

Geo (Earth) thermal (heat) energy is an enormous, underused heat and power resource that is clean (emits little or no greenhouse gases), reliable (average system availability of 95%), and homegrown.

It comes from radioactive decay in the core of the Earth, which heats the Earth from the inside out and thus energy/power can be extracted owing to the temperature difference between hot rock deep in the earth and relatively cool

[39] *supra* 17

[40] *supra* note 5 at pg 14

surface air and water. This requires that the hot rock be relatively shallow, so it is site- specific and can only be applied in geologically active areas.

Geothermal systems are much more efficient than competing fuel technologies. They are an average of 48% more efficient than the best gas furnaces on a source fuel basis, and over 75% more efficient than oil furnaces.[41]

ii. Ocean thermal and Tidal energy

The vast potential of energy of the seas and oceans which cover about three fourth of our planet, can make a significant contribution to meet the energy needs. Ocean contains energy in the form of temperature gradients, waves and tides and ocean current, which can be used to generate electricity in an environment-friendly manner. Technologies to harness tidal power, wave power and ocean thermal energy are being developed, to make it commercially viable.

iii. Hydrogen and Fuel Cells

In both Hydrogen and Fuel Cells electricity is produced through an electro-chemical reaction between hydrogen and oxygen gases. The fuel cells are efficient, compact and reliable for automotive applications. Hydrogen gas is the primary fuel for fuel cells also. Hydrogen can be produced from the electrolysis of water using solar energy. It can also be extracted from sewage gas, natural gas, naptha or biogas. Fuel cells can be very widely used once they become commercially viable.

[41] Renewable Energy sources, Geo Thermal, http://www.terienvis.nic.in/enrg-geo.htm

3.1. NUCLEAR POWER SCENARIO IN INDIA

Nuclear power is the fourth-largest source of electricity in India after thermal, hydro and renewable sources of electricity.[42]As of 2008, India has 17 nuclear power plants in operation generating 4,120 MW while 6 other are under construction and are expected to generate an additional 3,160 MW. Electricity demand in India has been increasing rapidly, and the 534 billion kilowatt hours produced in 2002 was almost double the 1990 output, though still represented only 505 kWh per capita for the year[43]. In 2006, 744 billion kWh gross was produced, but with huge transmission losses this resulted in only 505 billion kWh consumption.[44] Nuclear power supplied 15.8 billion kWh (2.5%) of India's electricity in 2007 from 3.7 GWe (of 110 GWe total) capacity and this will increase steadily as imported uranium becomes available and new plants come on line. India's fuel situation, with shortage of fossil fuels, is driving the nuclear investment for electricity, and 25% nuclear contribution is foreseen by 2050, from one hundred times the 2002 capacity.[45] Almost as much investment in the grid system as in power plants is necessary.

SELF RELIANT INDIA

[42] http://cea.nic.in/power_sec_reports/Executive_Summary/2008_12/27-33.pdf

[43] Nuclear Power in India, Information papers, World Nuclear Association, http://www.world-nuclear.org/info/inf53.html

[44] *ibid.*

[45] *ibid.*

Nuclear power for civil use is well established in India. In 1954, India's First Prime Minister, Jawaharlal Nehru, said "It is perfectly clear that atomic energy can be used for peaceful purposes"[46]. India, being a non-signatory of the Nuclear Non-Proliferation Treaty, has been subjected to a defacto nuclear embargo from members of the Nuclear Suppliers Group (NSG) cartel. This has prevented India from obtaining commercial nuclear fuel, nuclear power plant components and services from the international market, thereby forcing India to develop its own fuel, components and services for nuclear power generation.

The Indian nuclear power industry is expected to undergo a significant expansion in the coming years, thanks in part to the passing of The Indo-US nuclear deal. This agreement will allow India to carry out trade of nuclear fuel and technologies with other countries and significantly enhance its power generation capacity.[47] when the agreement goes through, India is expected to generate an additional 25,000 MW of nuclear power by 2020, bringing total estimated nuclear power generation to 45,000 MW.[48]

India has already been using imported enriched uranium and are currently under International Atomic Energy Agency (IAEA) safeguards, but it has developed various aspects of the nuclear fuel cycle to support its reactors. Development of select technologies has been strongly affected by limited imports. Use of heavy water reactors has been particularly attractive for the

[46] Assisting Energy Independence Or A Dangerous Experiment?, Avilash Roul, vilable at http://www.ecoworld.com/features/2006/09/10/nuclear-power-in-india/

[47]http://www.ptinews.com/pti%5Cptisite.nsf/0/E696AFE1CBD8BA4C652574A600103BE1?OpenDocument

[48] http://www.livemint.com/2008/07/10012202/At-G8-Singh-Bush-reaffirm-c.html

nation because it allows Uranium to be burnt with little to no enrichment capabilities. India has also done a great amount of work in the development of a Thorium centered fuel cycle. While Uranium deposits in the nation are limited (see next paragraph) there are much greater reserves of Thorium and it could provide hundreds of times the energy with the same mass of fuel. The fact that Thorium can theoretically be utilized in heavy water reactors has tied the development of the two. A prototype reactor that would burn Uranium-Plutonium fuel while irradiating a Thorium blanket is under construction at the Madras/Kalpakkam Atomic Power Station.

3.2. REGULATION AND SAFETY[49]

The Atomic Energy Commission (AEC) was established in 1948 under the Atomic Energy Act as a policy body. Then in 1954 the Department of Atomic Energy (DAE) was set up to encompass research, technology development and commercial reactor operation. The current Atomic Energy Act is 1962, and it permits only government-owned enterprises to be involved in nuclear power.

The DAE includes NPCIL, Uranium Corporation of India (mining and processing), Electronics Corporation of India Ltd (reactor control and instrumentation) and BHAVIN* (for setting up fast reactors). The government also controls the Heavy Water Board for production of heavy water and the Nuclear Fuel Complex for fuel and component manufacture.

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[49] Nuclear Power in India, http://www.world-nuclear.org/info/inf53.html

* Bhartiya Nabhikiya Vidyut Nigam Ltd

The Atomic Energy Regulatory Board (AERB) was formed in 1983 and comes under the AEC but is independent of DAE. It is responsible for the regulation and licensing of all nuclear facilities, and their safety and carries authority conferred by the Atomic Energy Act for radiation safety and by the Factories Act for industrial safety in nuclear plants.

NPCIL is an active participant in the programmes of the World Association of Nuclear Operators (WANO).

3.3. NON-PROLIFERATION, US-INDIA AGREEMENT AND NUCLEAR SUPPLIERS' GROUP[50]

India's nuclear industry has been largely without IAEA safeguards, though four nuclear power plants (see above) have been under facility-specific arrangements related to India's INFCIRC/66 safeguards agreement with IAEA.

India's situation as a nuclear-armed country excluded it from the Nuclear Non-Proliferation Treaty so this and the related lack of full-scope IAEA safeguards meant that India was isolated from world trade by the Nuclear Suppliers' Group. A clean waiver to the trade embargo was agreed in September 2008 in recognition of the country's impeccable non-proliferation credentials. India has always been scrupulous in ensuring that its weapons material and technology are guarded against commercial or illicit export to other countries.

[50] *ibid.*

Following the 2005 agreement between US and Indian heads of state on nuclear energy cooperation, the UK indicated its strong support for greater cooperation and France then Canada then moved in the same direction. The US Department of Commerce, the UK and Canada relaxed controls on export of technology to India, though staying within the Nuclear Suppliers Group guidelines. The French government said it would seek a nuclear cooperation agreement, and Canada agreed to "pursue further opportunities for the development of the peaceful uses of atomic energy" with India.

In December 2006 the US Congress passed legislation to enable nuclear trade with India. Then in July 2007 a nuclear cooperation agreement with India was finalized, opening the way for India's participation in international commerce in nuclear fuel and equipment and requiring India to put most of the country's nuclear power reactors under IAEA safeguards and close down the Cirus research reactor by 2010. It would allow India to reprocess US-origin and other foreign-sourced nuclear fuel at a new national plant under IAEA safeguards. This would be used for fuel arising from those 14 reactors designated as unambiguously civilian and under full IAEA safeguards.

The IAEA greeted the deal as being "a creative break with the past" - where India was excluded from the NPT. After much delay in India's parliament, it then set up a new and comprehensive safeguards agreement with the IAEA, plus an Additional Protocol. The IAEA board approved this in July 2008, after the agreement had threatened to bring down the Indian government. The agreement is similar to those between IAEA and non nuclear weapons states, notably Infcirc-66, the IAEA's information circular that lays out procedures

for applying facility-specific safeguards, hence much more restrictive than many in India's parliament wanted.

The next step in bringing India into the fold was the consensus resolution of the 45-member Nuclear Suppliers Group (NSG) in September 2008 to exempt India from its rule of prohibiting trade with non members of the NPT. A bilateral trade agreement then went to US Congress for final approval. Similar agreements will apply with Russia and France. The ultimate objective is to put India on the same footing as China in respect to responsibilities and trade opportunities, though it has had to accept much tighter international controls than other nuclear-armed countries.

The introduction to India's safeguards agreement says that India's access to assured supplies of fresh fuel is an "essential basis" for New Delhi's acceptance of IAEA safeguards on some of its reactors and that India has a right to take "corrective measures to ensure uninterrupted operation of its civilian nuclear reactors in the event of disruption of foreign fuel supplies." But the introduction also says that India will "provide assurance against withdrawal of safeguarded nuclear material from civilian use at any time." In the course of NSG deliberations India also gave assurances regarding weapons testing.

In October 2008 US Congress passed the bill allowing civil nuclear trade with India, and a nuclear trade agreement was signed with France. The 2008 agreements ended 34 years of trade isolation on nuclear materials and technology.

India's safeguards agreement was signed early in 2009, though the timeframe for bringing the eight extra reactors (beyond Tarapur, Rawatbhata and Kudankulam) under safeguards still has to be finalised. The Additional Protocol to the safeguards agreement was agreed by the IAEA Board in March 2009, but needs to be ratified by India.

Nuclear power holds a great deal of potential in India and the government is increasingly relying on its development to hit its power generation targets. The country has recently established a civil nuclear cooperation deal with the United States. Internationally, controversy has historically surrounded India's nuclear program in light of the country's refusal to sign the Nuclear Nonproliferation Treaty (NPT) and its 1974 nuclear weapons test. The U.S.-India civil nuclear energy cooperation deal, signed in July 2005, is no exception. Also known as the "123 Agreement", the deal allows for civil nuclear trade between the U.S. and India with the goal of increasing India's installed nuclear power generation capacity.

In light of the deal, the Indian government has set its nuclear generation target at 40,000 MW by 2020, already showing an increase from its original goal of 20,000 MW. India currently has 14 nuclear reactors in commercial operation with more planned. Recently, India bought six nuclear reactors from Areva of France and four from Rosatom of Russia. They are slated for the Maharashtra and Tamil Nadu nuclear projects. Combined, the ten new reactors will add 11,000 MW of electric capacity to the country.

In addition, in September 2008, India and France also signed a civil nuclear energy cooperation deal that will further enhance India's future nuclear energy generation capabilities.

3.4. NUCLEAR POWER GENERATION

Subsequent to the Indo-US nuclear deal and India getting clearance from the Nuclear Suppliers Group (NSG), nuclear power generation is likely to provide an opportunity of US$ 10 billion in the next five years, according to a JP Morgan estimate. India will now also be partnering several countries for nuclear fuel technology projects.

- As a part of the Eleventh Five-Year-Plan, Nuclear Power Corporation of India Ltd (NPCIL) will be commencing work on 12 reactors. NPCIL will be developing a series of nuclear reactors with capacities between 1,000 MW to 1,650 MW at 5-6 sites along the country's coastline.
- India will also be exploring export opportunities and is planning to set up nuclear power reactors abroad. Three Indian public sector companies—the NPCIL, BHEL and NTPC—will be setting up a company for the export of nuclear power reactors.
- GE Hitachi Nuclear Energy has tied up with NPCIL and BHEL for building multiple GEH-designed nuclear reactors.
- Sweden sees a market of around US$2 billion in India for back-end operations like nuclear waste management.
- NTPC Ltd and NPCIL would jointly invest around US$ 3.09 billion in the next eight years to set up nuclear power plants in the country.[51]

[51] http://www.ibef.org/economy/power.aspx

CHAPTER 4- REGULATORY FRAMEWORK

4.1. HISTORICAL DEVELOPMENT OF POWER SECTOR IN INDIA

Power progress in India commenced at the ended of the 19th century with the commissioning of electricity supply in Darjeeling during 1887, followed by commissioning of a hydro-power station at Sivasamudram in Karnataka in the year 1902.[52] In the pre-independence era, the power supply was largely in the private sector that too restricted to the urban areas. With the formation of State Electricity Boards, a significant step was taken in bringing about systematic growth of power supply industry all over the country. A number of being and with the setting up of thermal, hydro and nuclear power stations, power generation started increasing significantly.

The Ministry of Power is primarily responsible for the development of electrical energy of the country. The Ministry is concerned with perspective planning, policy formulation, processing of projects for investment decisions, monitoring of the implementation of power projects, training and manpower development and the administration and enactment of legislation with regard to thermal and hydro-power generation, transmission and distribution. In all

[52] P.N.Singh, J.K.Singh, Kumar Rathnesh, Encyclopedia of Indian Economy, Deep and Deep Publications, Delhi, 2008

technical matters, the Ministry of Power is assisted by the Central Electricity Authority (CEA).[53]

The construction and operation of generation and transmission projects in the central sector are entrusted to Central Sector Power Corporations, viz., the National Thermal Power Corporation, the National Hydro Electric Power Corporation and the Power Grid Corporation of India Limited. The Power Grid is responsible for all the existing and future transmission projects in the Central Sector and also for the formation of the National Power Grid. Two joint-venture power corporations, namely, Satluj Jal Vidyut Nigam and Tehri Hydro Development Corporation, are responsible for the execution of the Naptha Jhakri Power Project in Himachal Pradesh and projects of Tehri Hydro Power Complex in Uttranchal respectively. Three statutory bodies, i.e. the Damodar Valley Corporation, the Bhakra-Beas Management Board an Bureau of Energy Efficiency, are also under the administrative control of the Ministry of Power. Programmes of Rural Electrification are provided financial assistance by the Rural Electrification Corporation. The Power Finance Corporation provides term-finance to projects in the power sector. The autonomous bodies, namely Central Power Research Institute and the National Power Trading Institute are also under the administrative control of the Ministry of Power. A Power Trading Corporation has also been incorporated primarily to support the Mega Power Projects in the private sector by acting as a single entity to enter into Power Purchase Agreements.

4.2. FRAMEWORK

[53] *ibid.*

4.2.1. REGULATORY BODIES

CENTRAL ELECTRICITY AUTHORITY

Central Electricity Authority (CEA), a statutory organization constituted under section 3 (1) of the Electricity supply Act, 1948 which has been superseded by Section 70(1) of Electricity Act, 2003, plays an important role in formulating policies and programmes for power development in the country and in planning and coordinating various developmental activities in the Power Sector. CEA advises the Central Government on the matters relating to the National Electricity Policy, formulates short-term and perspective plans for development of the electrical system and coordinates the activities of the planning agencies for the optimal utilization of resources to subserve the interests of the national economy and to provide reliable and affordable electricity for all consumers.[54]

Under the Electricity Act, 2003, CEA makes regulations/standards on matters such as construction of electrical plants, electrical lines and connectivity to the grid, installation and operation of meters, concurrence of hydro-electric schemes, safety and grid standards. It also specified measures relating to safety with respect to electrical supply. This will inculcate higher efficiency in all fields of the power sector.

The CEA promotes and assists in timely completion of schemes and projects for improving and augmenting the electricity system by carrying out close monitoting of the construction of generation and transmission projects to ensure their timely completion by identifying bottlenecks and problem areas

[54] *ibid.*

and initiation of remedial measures/actions. It lays stress on improving the performance of existing power stations through better O & M practices, renovation and modernization and life extension programme. It is also charged with the responsibility of monitoring Schemes/ Projects for their timely completion.

Collection and recording the data concerning the generation, transmission, trading, distribution and utilization of electricity and carrying out studies realting to cost, efficiency, competitiveness, etc. are important function of CEA. It makes public from time to time information secured under the Electricity Act, 2003 and provides for the publication of reports and investigations. [55]

The CEA advises Central Government, state Government and Regulatory Commissions on all technical matters realating to generation, transmission and distribution of electricity. It also advises the State Governments, licenses or generating companies on such matters which shall enable them to operate and maintain the electricity system under their ownership or control in an improved manne and where necessary, in coordination with any other Government, licensee or the generating company owing or having control of another electricity system.

The CEA plays a leading role in promoting integrated operating of Regional Grid systems and the evolution of a National Grid. The Eastern, the North-Eastern and Western regions have been integrated and are operating in synchronous mode. Eastern Region is concerned with Northern as well as

[55] *ibid.*

Southern Region through HVDC back to back links. Similarly, Western region is also connected with Northern and southern Regions through the same arrangements. The CEA facilitates exchange of power within the country from surplus to deficit region and with neighboring countries for mutual benefits.

It promotes research in matters affecting the generation, transmission, distribution and trading of electricity, carries out, or cause to be carried out, any investigation for the purpose of generating or transmitting or distributing electricity and promotes measures for advancing the skills of persons engaged in the Electricity industry. It actively participates in power supply restoration process in case of occurrence of unfortunate incidents of destruction caused due to drought/ cyclone/ floods/ tsunami, etc. in various parts of the country.

CENTRAL ELECTRICITY REGULATORY COMMISSION (CERC)

CERC is a statutory body functioning under sec - 76 of the Electricity Act 2003 (CERC was initially constituted under the Electricity Regulatory Commissions Act, 1998 on 24th July, 1998)[56]

As entrusted by the Electricity Act, 2003 the Commission has the responsibility to discharge the following functions:-

Mandatory Functions[57]:-

[56] WWW.CERC.Inida.gov

[57] *ibid.*

(a) to regulate the tariff of generating companies owned or controlled by the Central Government;

(b) to regulate the tariff of generating companies other than those owned or controlled by the Central Government specified in clause (a), if such generating companies enter into or otherwise have a composite scheme for generation and sale of electricity in more than one State;

(c) to regulate the inter-State transmission of electricity ;

(d) to determine tariff for inter-State transmission of electricity;

(e) to issue licenses to persons to function as transmission licensee and electricity trader with respect to their inter-State operations.

(f) to adjudicate upon disputes involving generating companies or transmission licensee in regard to matters connected with clauses (a) to (d) above and to refer any dispute for arbitration;

(g) to levy fees for the purposes of the Act;

to specify Grid Code having regard to Grid Standards;

(h) to specify and enforce the standards with respect to quality, continuity and reliability of service by licensees.

(i) to fix the trading margin in the inter-State trading of electricity, if considered, necessary;

(j) to discharge such other functions as may be assigned under the Act.

Advisory Functions:-

(i) formulation of National electricity Policy and tariff policy;

(ii) promotion of competition, efficiency and economy in the activities of the electricity industry;

(iii) promotion of investment in electricity industry;

The State Electricity Regulatory Commission (SERC)

The State Electricity Regulatory Commission was to be constituted by the Government of the state under section 17 of the Electricity Regulatory Commissions Act, 1998. After the Electricity Act, 2003, the state commissions now come under the present Act since the Electricity Regulatory Commissions Act, 1998 has since been repealed.

The functions of the Commission under Section 86 of the Electricity Act,2003[58] are :-

1. The State Commission shall discharge the following functions, namely:
    a. determine the tariff for generation, supply, transmission and wheeling of electricity, wholesale, bulk or retail, as the case may be, within the State: Providing that where open access has been permitted to a category of consumers under section 42, the State Commission shall determine only the wheeling charges and surcharge thereon, if any, for the said category of consumers;

[58] http://www.erckerala.org/codes/about.htm, also http://www.pserc.nic.in/pages/aboutusmain.html

b. regulate electricity purchase and procurement process of distribution licensees including the price at which electricity shall be procured from the generating companies or licensees or from other sources through 46 agreements for purchase of power for distribution and supply within the State;

c. facilitate intra-state transmission and wheeling of electricity;

d. issue licences to persons seeking to act as transmission licensees, distribution licensees and electricity traders with respect to their operations within the State;

e. promote congenration and generation of electricity from renewable sources of energy by providing suitable measures for connectivity with the grid and sale of electricity to any person, and also specify, for purchase of electricity from such sources, a percentage of the total consumption of electricity in the area of a distribution licence;

f. adjudicate upon the disputes between the licensees, and generating companies and to refer any dispute for arbitration;

g. levy fee for the purposes of this Act;

h. specify State Grid Code consistent with the Grid Code specified under clause (h) of sub-section (1) of section 79;

i. specify or enforce standards with respect to quality, continuity and reliability of service by licensees;

j. fix the trading margin in the intra-State trading of electricity, if considered, necessary; and

k. discharge such other functions as may be assigned to it under this Act.

2. The State Commission shall advise the State Government on all or any of the following matters, namely :-.

i. promotion of competition, efficiency and economy in activities of the electricity industry;

ii. promotion of investment in electricity industry;

iii. reorganization and restructuring of electricity industry in the State;

iv. matters concerning generation, transmission , distribution and trading of electricity or any other matter referred to the State Commission by that Government.

The State Commission shall ensure transparency while exercising its powers and discharging its functions.

In discharge of its functions the State Commission shall be guided by the National Electricity Policy, National Electricity Plan and tariff policy published under section 3.

MINISTRY OF NEW AND RENEWABLE ENERGY

The Ministry of New and Renewable Energy (MNRE) is the nodal Ministry of the Government of India for all matters relating to new and renewable energy. The broad aim of the Ministry is to develop and deploy new and renewable energy for supplementing the energy requirements of the country.[59]

The role of new and renewable energy has been assuming increasing significance in recent times with the growing concern for the country's energy

[59] http://mnes.nic.in/

security. Energy 'self-sufficiency' was identified as the major driver for new and renewable energy in the country in the wake of the two oil shocks of the 1970s. The sudden increase in the price of oil, uncertainties associated with its supply and the adverse impact on the balance of payments position led to the establishment of the Commission for Additional Sources of Energy in the Department of Science & Technology in March 1981. The Commission was charged with the responsibility of formulating policies and their implementation, programmes for development of new and renewable energy apart from coordinating and intensifying R&D in the sector. In 1982, a new department, i.e., Department of Non-conventional Energy Sources (DNES), that incorporated CASE, was created in the then Ministry of Energy. In 1992, DNES became the Ministry of Non-conventional Energy Sources. In October 2006, the Ministry was re-christened as the Ministry of New and Renewable Energy.[60]

MINISTRY OF POWER

The ministry of power started functioning independently with effect from 2nd july, 1992. Earlier it was known as the Ministry of Energy comprising the Departments of Power, Coal and Non-Conventional Energy sources. Electricity is a concurrent subject at Entry 38 in List III of the Seventh Schedule of the Constitution of India. The Ministry of Power is primarily responsible for the development of electrical energy in the country. [61]

The Ministry is concerned with perspective planning, policy formulation, processing of projects for investment decision, monitoring of the

[60] *ibid.*

[61] http://www.powermin.nic.in/

implementation of power projects, training and manpower development and the administration and enactment of legislation in regard to thermal, hydro power generation, transmission and distribution.[62]

The Ministry of Power is responsible for the Administration of the Electricity Act, 2003, the Energy Conservation Act , 2001 and to undertake such amendments to these Acts, as may be necessary from time to time, in conformity with the Government's policy objectives.[63]

DEPARTMENT OF ATOMIC ENERGY

The Department of Atomic Energy (DAE) is a department within the Ministry of Science and Technology in India. The department is responsible for nuclear technology, including nuclear power and research.[64]

The vision of the Department of Atomic Energy is to empower India through technology, creation of more wealth and providing better quality of life to its citizen. This is to be achieved by making India energy independent, contributing to provision of sufficient, safe and nutritious food and better health care to our people through development and deployment of nuclear and radiation technologies and their applications.

The Department is engaged in the design, construction and operation of nuclear power / research reactors and the supporting nuclear fuel cycle technologies covering exploration, mining and processing of nuclear minerals, production of heavy water, nuclear fuel fabrication, fuel reprocessing and

[62] Ibid.

[63] Ibid.

[64] www.wikipedia.com

nuclear waste management. It is also developing advanced technologies which contribute to the national prosperity. The human resource developed and technical services being rendered by the Department have been greatly helping the Indian industry.

4.2.2. LEGISLATION

The first legislation on this subject was the Electricity Act, 1887 which provided for the protection of person and property from any risk or injury consequent to the supply and use of electricity. This Act was, however, repealed by the Indian Electricity Act, 1903 which was replaced in 1910 by the major amending Act. The Indian electricity Act, 1910 provided a basic legal framework for the electricity supply industry. Though the Act brought into effect certain important changes (such as grant of licenses for bulk supply and provision for purchase of electrical undertakings by the State), the excessive discretion vested in the hands of those who administered the law and the fact that the Act merely amended the law related to the supply and use of electricity, highlighted the need for a exhaustive code on this subject.

Where the Indian Electricity Act, 1910 dealt with the supply and use of electricity as well as the rights and obligations of the licensees, the subsequent enactment, the Electrical (Supply) Act, 1948 dealt with the Statutory powers and functions of the Central Electrical Authority, the State Electricity Boards ("SEBs") and Generating Companies.

One of the fundamental reasons for its enactment was the extension of the process of electrification to rural and semi-urban areas. The 1956 amendment to this Act saw an increase in the role of the State Government. The State Government now had supervisory control over the SEBs that led to huge

losses in their operation and widening of the gap between the demand and supply of electricity.

Although subsequent amendments were made to the Electricity (Supply) Act, 1948, it was the Electricity Regulatory Commissions Act in 1998 which sought to distance the government from the functioning of the SEBs. Under the Act, independent regulatory bodies were created at the Central and the State level, that is the Central Electricity Regulatory Commission and the State Electricity Regulatory Commissions respectively. The main objects of this Act were rationalisation of electricity tariff, transparency in policy formulations, promotion of efficient and environmentally benign policies as well as greater involvement of the private sector.

On June 10, 2003, the new Central Electricity Act was enacted. This Act seeks to usher in the 'second generation reforms' in the power sector (the first being brought in by the Electricity Regulatory Commissions Act, 1998). The Act repeals all previous Central laws in Electricity i.e. The Indian Electricity Act, 1910, The Electricity (Supply) Act, 1948 and the Electricity Regulatory Commissions Act, 1998. The Act seeks to establish a more competitive market in the Indian Electricity sector through the removal of a number of restrictive barriers. Apart from the steps taken to de-license the industry, the Act also takes into consideration social interests. Various provisions exist for the protection of consumer interests such as creation of Consumer Redressal Forums and Ombudsman, and creation of policies consistent with the environment friendly objective of the Act.

ELECTRICITY ACT, 2003: A SNAP-SHOT OF KEY CHANGES[65]

The Act essentially provided a "process map" for a market-based transparent regime through progressive introduction of competition and choice by incorporating impressive panoply of features comprising liberalization of captive generation, introduction of open access in transmission and subsequently in distribution, and the provision for issuing multiple distribution licenses in a given area. A critically important change that the Act sought to encourage was replacing the present Single-Buyer model to a Multi-Buyer model. This would lead to a paradigm change in the environment whereby monopoly of the SEBs for buying/selling power would cease, thus leading to a market determined tariff structure. Towards harmonization of regulation, the Act specificates that the principles laid out by the Central Electricity Regulatory Commission (CERC) in generation and transmission should guide SERCs. The Act wrote the code for the sector from a national perspective with regard to grid discipline and rationalized dispatch of power[66]. Some of the key features are:

1. *Generation*

(a) Any Company, association or body of individuals (even unincorporated) can generate electricity without requirement of techno-economic clearance of CEA, or approval of State Government or regulator, except in case of hydropower station for which written consent of Central Electricity Authority is required.

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[65] Abstracted from Paper titled *CURTAIN RAISER TO THE ELECTRICITY ACT, 2003,* J Sagar Associates, Available at *www.ficci.com/*

[66] The Power Sector in India: An Inquiry into the Efficacy of the Reform Process, Saugata Bhattacharya and Urjit R. Patel, Presentation at tbe Brookings-NCAER India Policy Forum 2007, New Delhi, July 17-18, 2007

(b) A Generating Company can supply electricity directly to more than one consumer and is vested with the duty to establish, operate and maintain sub-stations, tie lines etc.

(c) Any entity, (company, co-operative society or association of persons) can establish a Captive Generation Plant (CGP) primarily for its own use without any entry barriers. Open access is to be provided to all CGPs. No cross-subsidy surcharge would be levied on the persons who have established CGP for carrying electricity to destination of his own use.

2. *Rural Electrification/Generation/ Distribution*

(a) Government of India shall to formulate a National Policy after consulting State Governments & CEA, to govern (i) rural electrification and local distribution through local bodies[67], and (ii) rural off-grid supply including those based on renewable/non-conventional energy resources.

(b) No license is required for generating or distributing in rural areas notified by the State Govt.

3. *Licensing*

(a) Trading has been recognized as a separate licensed activity along with transmission and distribution. However, a license is not required in respect of (i) trading by a distribution licensee, (ii) transmission, distribution or trading by any Govt., as the Govt. would be deemed a licensee.

(b) Electricity Regulatory Commission (ERC), on the recommendation of Government, in accordance with the national electricity policy and public interest can exempt any of the local bodies[68] from requiring license.

4. *Trading and Captive Generation*

[67] Panchayat institutions, users associations, co-operative societies, NGOs or franchisees

[68] Ibid.

(a) Trading, i.e., purchase of electricity for resale, is a separate licensed activity, except for distribution licensees who do not require a separate trading license. Traders can enter into direct contracts with the consumers and determine its terms and conditions (including tariff).

(b) The Appropriate Commission may specify –

(i) the entry barriers for traders – technical requirements, capital adequacy requirement, and credit-worthiness;

(ii) duties, re-supply and trading in electricity to be discharged by a trader; and

(iii) fix trading margin in intra-state trading if considered necessary.

(c) ERCs have to develop trading market and have to be guided by National Tariff Policy.

5. *Open Access*

(a) Open access means non-discriminatory use of transmission lines, distribution system and associated facilities by any licensee/consumer/Genco in accordance with ERC regulations.

(b) The licensees, consumers and Gencos have to pay transmission/wheeling charges for open access. Consumers has to also pay a surcharge (to be utilized to meet cross subsidy) determined by ERC, for open access.

(c) ERC may order any licensee owning intervening transmission facilities to provide use of facilities to any other licensee, to the extent of surplus capacity.

(d) A State Transmission Utility is obliged to provide non-discriminatory open access to its transmission system for use by a licensee or Genco forthwith, or by any consumer once distribution level open access has been provided.

(e) There is no statutory time limit for introduction of open access. ERC has to

determine by June 10, 2004 the phases and conditions, subject to which open access would be introduced.

6. *Distribution*

(a) The distribution licensee has a mandatory duty to supply on request of consumer in a time bound manner if the consumer agrees to pay the applicable tariff. ERC is empowered to suspend or revoke license of a Discom for failure to maintain uninterrupted supply.

(b) Distribution licensee is empowered to recover charges/expenses/security and disconnect supply for non-payment of dues.

(c) Discoms can enter into direct contracts with consumers.

(d) Discoms can engage in other businesses but have to share revenue to reduce wheeling charges, and maintain separate accounts for the same.

(e) ERCs may grant more than one distribution licenses can be issued in a given area, permitting them to supply electricity through their own distribution system. To get a subsequent distribution licence any person will have to comply with additional requirements prescribed by GoI regarding capital adequacy, creditworthiness, or Code of Conduct etc.. If an applicant meets such requirements, he shall not be denied grant of the licence.

(f) ERCs may permit by regulations a consumer/class to receive supply of electricity from anyone other than the distribution licensee of the area of supply – against payment of wheeling charge & surcharge in lieu of cross subsidy.

(g) Distribution licensee is free to undertake distribution for a specified area within his area of supply without need for a separate licence. Provided that the distribution licensee shall remain liable for the supply.

7. Transmission

(a) To secure non-discriminatory open access, transmission has been segregated as a wires function without any trading (buying and selling). Central transmission utility (CTU) and all State transmission utilities (STUs) are deemed licensee.

(b) CTU and STUs functions are (i) Transmission; (ii) planning & co-ordination of transmission system; (iii) development of efficient and economical transmission lines from generating stations to load centers; (iv) providing non-discriminatory open access to the system.

(c) To secure efficient, economical and integrated transmission and supply of electricity –

(i) GoI shall demarcate India into regions;

(ii) NLDC, operated by a Government Company or authority or Corporation, shall co-ordinate and secure optimum scheduling and dispatch among RLDCs;

(iii) RLDCs, operated by a Government Company or authority or Corporation, shall ensure intra-regional integrated operation of the power system. In doing so, it shall comply with principles, guidelines & methodologies specified by CERC in the Grid Code;

(iv) SLDCs, operated by a Government Company or authority or Corporation, shall ensure integrated operation of the power system in a State.

(d) RLDCs and SLDCs are empowered to issue directions, and exercise supervision & control to ensure stability, efficiency & economy of grid operation in the region and the State respectively. Licensees, generating companies and other persons connected with operation of power system shall comply. SLDC shall ensure compliance with RLDC directions.

(e) Pending creation of separate RLDCs & SLDCs, the CTU and the STU shall perform the role.

8. *Tariff*

(a) Government has been distanced from determination of tariff. This power has been vested in the CERC/SERC. In determination of tariff CERC/SERC shall be guided by factors including National Electricity Policy, tariff policy (formulated by Central Government), CERC's principles and methodologies for setting tariff and principles rewarding efficiency and multiyear tariff[69].

(b) In case tariff is determined through transparent bidding as per Government of India guidelines, the same shall be adopted by the ERCs.

(c) To promote competition among distribution licensees, where there are 2 or more distribution licensees supplying in an area, the ERC may fix only maximum ceiling of tariff for retail sale.

(d) The PPAs/BSAs entered into before 10th June, 2003 have not been explicitly saved or granted a protection from regulatory intervention.

9. *Regulatory Commissions*

(a) It is mandatory to establish SERCs within 6 months from 10th June, 2003. Joint Commission can be constituted for two or more States or Union territories or both by mutual agreement.

(b) The new functions to be performed by CERC/ SERC include specifying Grid Code, Supply Code (only SERC), levy fees, fix trading margins in inter state trading[70].

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[69] The binding value of abovementioned guidelines is not clear as no express power to depart from these is provided.

[70] In discharge of all functions, CERC/SERC would be guided by National Electricity Policy/ Plan and Tariff Policy.

(c) In exercise of their functions, ERCs shall be guided by –

(i) National Electricity Policy, National Electricity Plan & Tariff Policy;

(ii) directions of GoI/State Government concerned, in matters of policy involving public interest – where such Government's decision shall be final as to whether the directions relates to a policy involving public interest. There is no express provision enabling ERCs to depart from such directions.

(d) Provision for separate ERC funds (not consolidated funds) for finance of ERC expenditures.

10. *Policy Issues*

(a) Central Government shall prepare, publish and revise National Electricity Policy and Tariff policy in consultation with State Govts and CEA[71].

(b) The implementation of the Act is largely dependent on the nature and scope of the diverse policy instruments to be issued by Government, and institutions like Special Courts, Appellate Electricity Tribunal, NLDC, RLDC, SLDC, SERCs and SEB successors to be constituted by Government's. It is noteworthy that these instruments will have a bearing are:-

(i) role and functioning of ERCs,

(ii) role and functioning of CEA,

(iii) market development,

(iv) governance of the sector – regulation, grid operations, safety issues, and enforcement.

4.2.3. POLICY INITIATIVES

POWER FOR ALL BY 2012

[71] It is noteworthy that ERC is not consulted in formulation of policy.

The Government of India has an ambitious mission of POWER FOR ALL BY 2012. This mission would require that our installed generation capacity should be at least 200,000 MW by 2012 from the present level of 144,564.97 MW. Power requirement will double by 2020 to 400,000MW.[72]

Objectives[73]

- Sufficient power to achieve GDP growth rate of 8%
- Reliable power
- Quality power
- Optimum power cost
- Commercial viability of power industry
- Power for all

Strategies

- Power Generation Strategy with focus on low cost generation, optimization of capacity utilization, controlling the input cost, optimisation of fuel mix, Technology upgradation and utilization of Non Conventional energy sources

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[72] Gujarat tops in rural electrification; several states falter, Available at http://www.sindhtoday.net/south-asia/10586.htm

[73] Electricity sector in India, Available at http://en.wikipedia.org

- Transmission Strategy with focus on development of National Grid including Interstate connections, Technology upgradation & optimization of transmission cost.

- Distribution strategy to achieve Distribution Reforms with focus on System upgradation, loss reduction, theft control, consumer service orientation, quality power supply commercialization, Decentralized distributed generation and supply for rural areas.

- Regulation Strategy aimed at protecting Consumer interests and making the sector commercially viable.

- Financing Strategy to generate resources for required growth of the power sector.

- Conservation Strategy to optimise the utilization of electricity with focus on Demand Side management, Load management and Technology upgradation to provide energy efficient equipment / gadgets.

- Communication Strategy for political consensus with media support to enhance the genera; public awareness.

MEGA POWER POLICY[74]

In 1995, the government strengthened its policy for privateinvestment in generation projects of over 1,000 MW capacity, for supplying electricity to more than one state, termed as mega power projects. The policy was intended to introduce competitive bidding for awarding projects. CEA, POWERGRID and NTPC, were to provide catalytic support to private investors by identifying potential sites, arranging the transmission of power and for preparing feasibility report respectively.

19 projects, 14 in the public sector and 5 in the private sector, were declared to be mega power projects. The Power Trading Corporation (PTC) was setup, to purchase power from the identified projects and to sell it to identified SEBs. This included, the adoption of a new

package of security mechanism consisting of a Letter of Credit and recourse to state government's share of the Central Plan Allocations

ACCELERATED POWER DEVELOPMENT REFORM PROGRAMME:

The Distribution Sector could not grow with the required pace due to paucity of funds and therefore, Distribution Reforms were initiated by the Government. MoUs and MoAs were signed with the States for linking the support of Government of India through APDRP which is ambitious plan for

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[74] Anoop Singh,Policy Developments for Private Investment in the Indian Power Sector, Asian Development Bank institute, Available at http://www.adbi.org/discussion-paper/2007/04/26/2236.policy.environment.power.sector/policy.developments.for.private.investment.in.the.indian.power.sector/

upgradation and strengthening of subtransmission and distribution system with the objective of reducing the AT&C losses to around15%.[75]

RURAL ELECTRIFICATION[76]

Jharkhand, Bihar, Uttar Pradesh, Orissa, Uttranchal, West Bengal etc are some of the states where significant number (more than 10%) of villages are yet to be electrified.

- Number of Villages (1991 Census) - 593,732
- Villages Electrified (30 May 2006) - 488,173
- Village level Electrification % - 82.2%

GRID-INTERACTIVE RENEWABLE POWER

The Ministry has set a goal of installing 10 percent of the additional power generation capacity in the country through grid connected renewable power by 2012. A target of 3075 MW capacity addition has been planned during X Plan period. Over 1200 MW capacity has been added through wind, small hydro and biomass power in the country in the last one year. This has been achieved by encouraging major investment from the market.[77]

WIND POWER PROGRAM

The annual wind power capacity addition touched a new height of 1000 MW as compared to an achievement of 615 MW during the last year. The

[75] Power, DIPP

[76] Ibid.

[77] A Snapshot of Renewable Energy in India, Available at http://www.renewableenergyworld.com/rea/news/article/2005/05/a-snapshot-of-renewable-energy-in-india-30729

cumulative installed wind power capacity has reached about 3500 MW. As a result, India now ranks in the fourth position in the world, after Germany, USA and Spain in wind power generation, thus overtaking Denmark. The first 2 MW wind turbine was installed at Chettikulam, Tirunelveli District, Tamil Nadu, which is the largest unit size installation in Asia.[78]

STANDALONE RENEWABLE ENERGY SYSTEMS

About 100,000 biogas plants and 16,530 solar photovoltaic lighting systems were installed during 2004-05. Biomass power projects aggregating to 140 MW capacity were installed, which have created large number of employment and income generation opportunities, especially in rural areas. In addition, 100 percent producer gas operated engine was developed and deployed in several villages for rural electrification.[79]

SOLAR THERMAL ENERGY

Over 150,000 square meters of collector area has been installed in the country for solar water heating in domestic, industrial and commercial sectors making the cumulative installed collector area over one million square meters. A solar steam cooking system consisting of 20 dishes of 12.6 square meters area each has been commissioned at Global Hospital and Research Centre, Mount Abu. The system produces around 1200 Kg. Of steam every day which is being used for the purpose of cooking, sterilization and laundry.[80]

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[78] *Ibid.*

[79] *Ibid.*

[80] *Ibid.*

OTHER MAJOR POLICY INITIATIVES TO STREAM LINE THE PROCESS OF PROJECT DEVELOPMENT IN THE POWER SECTOR[81]

- Captive Power Plants: Under the Electricity Act 2003 captive power plants including group captive, have been freely permitted. The Act provides, that any person may construct, maintain or operate a captive generating plant and dedicated transmission lines and shall have the right to open access for carrying electricity from his captive generating plant to the destination of his use, subject to the availability of transmission capacity.
- Open Access to Transmission: Under the provisions of the Electricity Act 2003, open access in transmission has been introduced to promote competition amongst the generating companies, who can now sell to different distribution licensees across the country. Open access has been made available to captive generating plants, subject to availability of transmission capacity.
- No Techno-Economic Clearance for Thermal Generation
- Generation has been delicensed under the Electricity Act, 2003. The requirement of techno economic clearance of CEA for thermal power plants has also been done away with.

[81] Power, Market and opportunities, India Brand Equity Foundation, Haryana

- Automatic Approval for FDI: In order to facilitate FDI, automatic approval (RBI route) for 100 per cent foreign equity without any upper ceiling on the quantum of investment is permitted in all sectors of the power sector, i.e., generation, transmission and distribution of electricity.
- Generating company permitted to distribute electricity in rural areas: The Electricity Act, 2003, allows any generator of electricity to distribute electricity in a rural area without the requirement of any license, subject to compliance with measures as may be specified by the CEA.

NEW INITIATIVES

Major thrust is being given towards - research, development, demonstration, commercialization and deployment of new and renewable energy systems/devices for transportation, portable and stationary applications for rural, urban, industrial and commercial areas. Alternate Fuels for surface transportation including electric/hydrogen/hybrid vehicles. Bio-fuel is being developed for motive power for stationary/portable applications. A steering group, set up by the National Hydrogen Energy Board, under Shri Ratan Tata, is about to prepare final action plan for public private partnership and the road map for hydrogen energy. A new component of cow dung based power plants have been introduced in the biogas program.[82]

[82] Ibid.

FOREIGN DIRECT INVESTMENT-PROCESS AND PROCDURES

5.1. FDI SCENARIO IN INDIA

Major infrastructure development requires a substantial influx of investment capital. The policies of the Indian Government seek to encourage investments in domestic infrastructure from both local and foreign private capital. The country is already a hot destination for foreign investors. As per the World Investment Report of the UNCTAD, India was rated the second most attractive location (after China) for global FDI in 2007[83].

Currently, India has FDI of about US$21 billion per year, well below the targeted US$30 billion[84]. In order to increase FDI inflows, particularly with a view to catalyzing investment and enhancing infrastructure, the Indian Government has introduced significant policy reforms. For example, it now permits 100% FDI under the automatic route for a broad range of sectors only certain post investment intimation is required. For FDI in a few sectors, a prior approval is required, which takes around 6-8 weeks[85]. As part of policy reforms, the Indian Government is constantly simplifying the approval route process, including setting up several agencies to expedite FDI approval. Further liberalization is expected as the Government continues to emphasize infrastructure investment.

[83]India second best destination for FDI in 2007: UNCTAD, http://economictimes.indiatimes.com/articleshow/2464156.cms

[84] Infrastructure in India- A vast land of construction opportunity, PricewaterhouseCoopers. Available at *www.pwc.com/in/*

[85] *ibid.*

Approval Route – Permission required	Automatic Route – Freely permissible (100%)
⇩	⇩
• Existing Airports – beyond 74% • Atomic Minerals • In case of joint venture or technology • collaboration agreement in the same field	• Greenfield airports • Construction & maintenance of infrastructure like ports, harbors, roads and highways • Power generation, transmission and distribution and power trading (atomic energy not permitted) • Mass rapid transport systems • Townships, housing, built-up infrastructure and construction-development projects

Figure showing FDI Routes[86]

In August 2008, a press report[87] stated that Morgan Stanley was looking to invest up to a quarter of its US$4 billion global infrastructure fund in emerging markets, notably India and China – and that in India, Morgan Stanley would face competition from Australia's Macquarie Group, JP Morgan, Goldman Sachs and Deutsche Bank, all looking to channel foreign

[86] *ibid.*

[87] Daily Business Activity in India, Available at http://www.indiaabc.com/ibbinternet/byfcompany.aspx

investors' money into Indian infrastructure. While some of this planned investment may be reduced or delayed given the current environment in the credit markets, India is still likely to garner substantial FDI, particularly if its economy is able to maintain a fairly strong rate of growth in the face of a global recession.

From an exchange control perspective, India is moving towards full current account convertibility. Most revenue transactions are freely permitted, except certain transactions like royalty, consultancy fees, etc., which are subject to certain limits. Capital account transactions need prior approval, except where specifically permitted. In order to promote the construction sector, the Indian Government has relaxed some of the exchange control restrictions and is now allowing foreign nationals/ citizens to acquire immovable property in India, subject to certain conditions and procedures.[88]

5.1.1. INDIA'S FOREIGN INVESTMENT REGULATIONS

In India no investment is allowed in a few sensitive sectors. But there are sectors where approvals are not automatic and are accorded on a case-to-case basis on merit. In all other sectors, foreign investment is allowed on an automatic basis up to the permissible limit set for a sector, i.e., it does not require prior approval of the GoI, and the investment is required to be notified within a specified period. [89]

Approvals can follow one of the two routes, namely the Automatic Approval route or the Specific Approval route. The government, from time to time, notifies "sector specific guidelines for FDI" delineating the percentage of FDI

[88] *supra* note 84

[89] Investing in India, FDI Policies and Procedures, DIPP, Minstry of Commerce, New Delhi

permitted in specified sectors/activities. The guidelines also specify if the foreign investment would fall under the automatic or approval route. In the sectors/ activities not listed in the guidelines, FDI is permitted up to 100 percent under the automatic route, subject to the applicable sectoral rules / regulations.[90]

i. The Automatic Route

This route applies to all proposals that are totally in line with the investment guidelines set for the sector. No prior approval is necessary for investments under the automatic route. However, the name of the collaborators, particulars of allotment, copy of the foreign collaboration agreement, the original foreign inward remittance certificate from the authorized dealer and other specified information are to be presented to the RBI within 30 days of bringing in their investment.

ii. The Specific Approval Route

FDI activity not covered under the automatic route requires prior government approval and is considered by the Foreign Investment Promotion Board, Department of Economic Affairs, Ministry of Finance on a case-to-case basis.[91]

The FIPB, comprising the secretaries of Departments/Ministries of Industries, Commerce, Finance and External Affairs, besides officials from various administrative Ministries, meets every week and considers applications in their totality. The decision of the committee is communicated within 30 days[92] and

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[90] *ibid.*

[91] Investing in India, Regulations an d Incentives, FML, Delhi

[92] *ibid.*

applicants can also ascertain the status from the SIA website http:// indmin.nic.in by keying in their acknowledgement number. While granting approval, weightage is given to the employment potential, potential inflow of foreign exchange through exports, long term competitive advantage to India and favourable alignment of the proposals with government priorities like poverty alleviation, infrastructure development etc. The comments of the administrative Ministry as well as the industry development departments of the recipient State are well considered while clearing the proposal.

- FEMA

The provisions, which apply only to entry of FDI, spring from the Foreign Exchange Management Act, 1999. The route to foreign investment has been made easier as the propel is more on management of foreign investment rather than on regulation as was rampant under its antecedent regulation, Foreign Exchange Regulation, 1973. India's foreign investment regulations are two branched, one relates to the authorisations or licenses required by a foreign investor, and the other deals with the link between the subsidiary or joint venture company and its foreign parent company or investor, as the case may be.[93]

- Regulation Governing Relations With Parent Company

The trade account is fully convertible, which means that foreign exchange is easily available for all essential classes of payments such as, import/ export trade, business profits, technology fees, royalties, training, healthcare, education and overseas travel. While full capital convertibility is yet to be

[93] *ibid.*

introduced in India, few specified transfers are allowed on the capital account. The capital and profits of foreign investment in approved industrial activities are fully repatriable after deduction of applicable withholding taxes and other deductions, if any.[94]

- Procedure for Profit Repatriation

Profit repatriation can be in the form of dividends and bonus shares or from capital gains from the sale of investments in India. Indian companies must pay a dividend distribution tax of 15 per cent + 10 per cent Surcharge + 3 per cent Education Cess (equivalent to 16.995 per cent) on the distributed profits, which are not further taxed in the hands of the beneficiary shareholders, including nonresident shareholders.

Dividends to foreign shareholders must be repatriated within 42 days of their being announced, after submitting the necessary documentation to the RBI. The net dividends received from India are taxfree in the overseas recipient country, as provided in India's double taxation avoidance with several countries.

- Acquisition of Immovable property

Acquisition of immovable property by a non-resident: A person residing outside India, who has been permitted by RBI to establish a branch, or office, or place of business in India (excluding a Liaison Office), has general permission of RBI to acquire immovable property in India that is necessary for, or incidental to, the activity. However, in such cases, a declaration, in prescribed form (IPI), is required to be filed with the RBI, within 90 days of the acquisition of immovable property.

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[94] *ibid.*

Foreign nationals of non-Indian origin who have acquired immovable property in India with the specific approval of the RBI cannot transfer such property without prior permission from the RBI.

Acquisition of immovable property by an NRI: An Indian citizen residing outside India (NRI) can acquire by way of purchase any immovable property in India other than agricultural/plantation/farm house. He may transfer any immovable property other than agricultural or plantation property or farm house to a person resident outside India who is a citizen of India or to a person of Indian origin resident outside India or a person resident in India.[95]

5.1.2. ENTRY OPTIONS IN INDIA FOR A FOREIGN ENTERPRISE

The Indian market opened up for foreign investors with the scrapping of industrial licensing and relaxation of FDI norms considerably. Currently, there are various options available to a foreign enterprise for setting up operations in India.

Entry Options in India

A foreign enterprise wishing to conduct business in India can opt for the following main options:

a. Liaison office:

The role of the liaison office is limited to collecting information about possible market opportunities and providing information about the company and its products to prospective Indian customers. It can promote export/import from/to India and also facilitate technical/financial collaboration between the parent company and companies in India. A liaison office cannot however,

[95] *ibid.*

undertake any commercial activity directly or indirectly and cannot, therefore, earn any income in India. Grant of approval for the establishment of a liaison office in India is by the Reserve Bank of India (RBI).[96]

b. Project office:

Foreign companies planning to execute specific projects in India can set up temporary project/site offices in India. The RBI has now granted general permission to foreign entities to establish project offices subject to specified conditions.

Such offices cannot undertake or carry on any activity other than that which is related and incidental to the execution of the projects. Project offices may remit the surplus of the project on completion outside India, a general permission for which has been granted by the RBI.[97]

c. Branch Office:

Foreign companies engaged in manufacturing and trading activities abroad are allowed to set up Branch Offices in India

for the following purposes:

i. Export/Import of goods.

ii. Rendering professional or consultancy services.

iii. Carrying out research work in which the parent company is engaged.

iv. Promoting technical or financial collaboration between Indian companies and parent or overseas group companies.

v. Representing the parent company in India and acting as buying/selling agent in India.

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[96] *supra* note 89

[97] *ibid.*

vi. Rendering services in Information Technology and development of software in India.

vii. Rendering technical support to the products supplied by the parent/group companies.

viii. Foreign airline/shipping company.

A branch office is not allowed to carry out manufacturing activities on its own but is permitted to subcontract these to an Indian manufacturer. Branch offices established with the approval of the RBI may remit outside India the profit of the branch net of applicable Indian taxes and subject to RBI guidelines. Grant of permission for setting up branch offices is by RBI.[98]

d. JOINT VENTURE:

This is a popular route for foreign companies wishing to establish a base in India. For this purpose, an Indian company with limited liability is incorporated in India under the Companies Act and investment made along with a suitable business partner. Depending upon the business sector, the investments on repatriation basis can be made into this Indian company under automatic route or through prior approval of the GoI acting through the FIPB. Foreign equity in such Indian companies can be up to 100 per cent depending on the business of the Indian company (in which case a wholly owned subsidiary can be set up by the foreign investor as discussed below), prevailing investment policies of the government and receipt of requisite approvals.[99]

e. WHOLLY OWNED SUBSIDIARIES:

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[98] *ibid.*

[99] *ibid.*

There are certain sectors where the GoI permits 100 per cent FDI. In such cases, the foreign investor can set up its wholly owned subsidiary. Investors prefer such a set up as they are able to exercise maximum control over its functioning and obtain maximum gain therefrom. A wholly owned subsidiary can be incorporated either as a public or a private company. It is more advantageous to form a private company because private companies are formed with just 2 to 50 members and many provisions of the Companies Act are not applicable. Also, restrictions on transfer of shares are permitted and invitation to public to subscribe to its share capital is not allowed. Shares of the public limited companies on the other hand, are normally freely transferable and a minimum of seven members are required to form the company. Further, a company to be incorporated as a private company must have a minimum paid-up equity share capital of Rs. 100,000 while a public company must have a minimum paid-up capital of Rs. 500,000. It is essential to point out here that in terms of the Companies Act, a private company, which is a subsidiary of a public company, falls under the definition of a public company. Thus, if a private company in India were a subsidiary of a foreign body corporate, which if incorporated in India would be treated as a public company as per the definition in the Companies Act, the said private company would be treated as a public company. The only exception to this rule is where one or more foreign bodies corporate hold the entire share capital of the private company. [100]

f. PROCEDURE FOR INCORPORATION OF A COMPANY IN INDIA

[100] Supra note 9

The first step in incorporating a company in India is to obtain the name approval for the company, from the Registrar of Companies in the State / Union Territory in which the company will maintain its registered office. This approval is provided, subject to certain conditions. For instance, there should not be an existing company by the same name. Further, the last words in the name are required to be "Private Limited" in the case of a private company limited by shares and "Limited" in the case of a public company limited by shares. The second step is the drafting of the Memorandum and the Articles of Association of the company and filing of the same with the concerned Registrar of Companies. The Memorandum of Association is a document that sets out the constitution of the company. It contains, *inter alia*, the objects and the scope of activities of the company and the extent of authorized share capital of the company.

The Articles of Association contain the rules and regulations of the company or the management of its internal affairs. While the Memorandum specifies the objects and purposes for which the Company has been formed, the Articles of Association lay down the rules and regulations for achieving those objects and purposes. The Articles of Association would set out the contract between the shareholders of the company with regard to the management of the company and transfer of its shares.

The third step is to register the company, which is completed when the Registrar of Companies issues the certificate of incorporation. The Registrar of Companies will give the certificate of incorporation after the required documents are presented along with the requisite registration fee, which is scaled according to the authorized share capital of the company. A private

company can commence business on receipt of its certificate of incorporation. However, in addition, a public company needs a certificate of commencement of business from Registrar of Companies to commence the business.

A public company has the option of inviting the public for subscription to its share capital. Accordingly, the company has to issue a prospectus, which provides information about the company to potential investors. The Companies Act specifies the information to be contained in the prospectus.[101]

5.2. FDI IN NON-CONVENTIONAL ENERGY SECTOR

The FDI Inflows to Non-conventional Energy has helped the Non-Conventional Energy sector to develop its infrastructure. The Non-conventional Energy sources are abundant in India and so are the possibilities of growth in this sector.[102]

FDI Inflows to Non-conventional Energy played an important part in the developing the required infrastructure for tapping Non-Conventional Energy from various sources. The Non-Conventional Energy sources such as Wind, Solar Thermal, Solar Photo-voltaic, Small Hydro, Co-generation, Biomass, Tidal, Geothermal and Urban & Industrial Wastes have huge potential of providing clean energy without causing pollutions.

5.2.1. INVESTMENT POLICY

[101] Ibid.

[102] FDI Inflows to non-conventional Energy, Available at http://business.mapsofindia.com/fdi-india/sectors/non-conventional-energy.html

- The Central Government has formulated the Foreign Direct Investment Policy, pertaining to the Non-Conventional Energy sector. Foreign investors are entitled to indulge in joint operations with Indian counterparts through technological and financial collaborations for establishing renewable energy based power generation projects.
- The process of foreign investment approval has been liberalized with the aim of providing transfer of technology and foreign financial investments by means of joint ventures
- FDI up to 100% is allowed in case of equity[103]
- The Central Government has been encouraging foreign investors to establish renewable energy based power generation project on Build-Own-Operate basis. [104]

5.2.2. MAJOR CLEARANCES REQUIRED FOR PROJECTS IN INDIA

Approvals/ Clearances Required	**Department to be Approached and Consulted**
Incorporation of Company	Registrar of Companies
Registration/IEM/Industrial license	DIC for SSI/SIA for large and medium industries
Allotment of land	State DI/SIDC/Infrastructure Corporation /SSIDC

[103] PN 7/2008 www.DIPP.NIC.IN

[104] FDI Policy and Business Opportunities, Indian Investment Centre, http://iic.nic.in/iic3_a.htm

Permission for land use (in case industry is located outside an industrial area)	a. State DI b. Dept. of Town and Country Planning Local authority/Distt. Collector
NOC and consent under Water and Air Pollution Control Acts	State Pollution Control Board
Approval of construction activity and building plan	a. Town and country planning b. Municipal and local authorities c. Chief Inspector of Factories d. Pollution Control Board Electricity Board
Sanction of Power	State Electricity Board
Use and storage of explosives	Chief Controller of Explosives

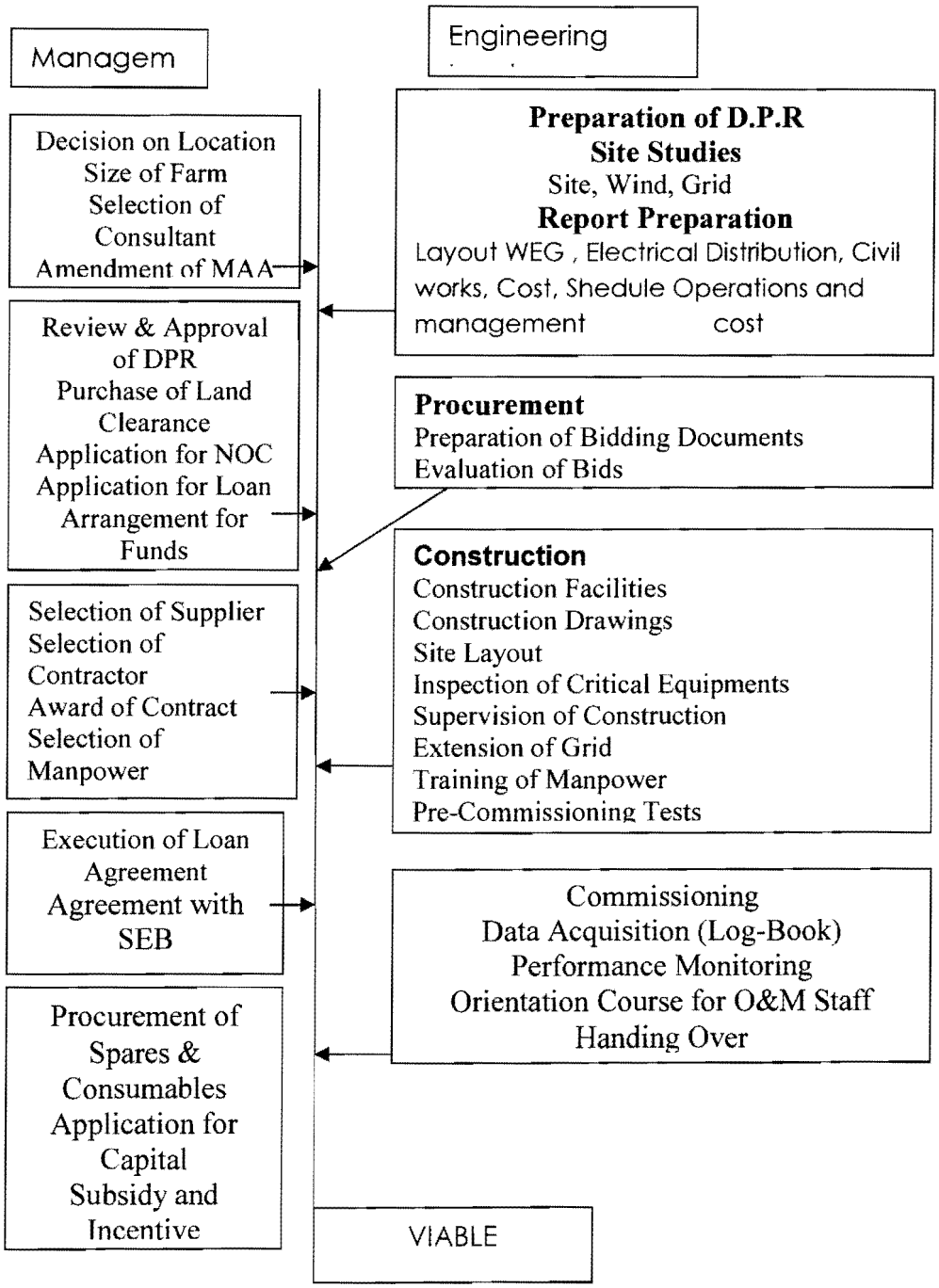
Boiler Inspection Certificate	Chief Inspector of Boilers
Finance	i. SFC/SIDC for term loans ii. For loans higher than Rs. 15 Million, all India financial institutions like IDBI, ICICI, IFCI etc.
Registration under States Sales Tax Act, and Central and State Excise Act	i. Sales Tax Department ii. Central and State Excise Depts.
ISI Certificate	Regional Office of the Bureau of Indian Standards (BIS)
Quality Marking Certificate	Quality Marking Center of the State Government
Code Number for Export and Import	Regional Office of Director General of Foreign Trade.
Water Availability	Appropriate state Government
Environmnet and Forest Clearance	State Government and Ministry of Environment and forest
Civil Aviation clearance for wind turbine etc	National Airport Authority
Rehabilitation and resettlement of displaced families	Ministry of Environment and forest State Governments

Land Availability	Private negotiations

Source: DIPP[105]

5.2.3. GUIDELINES FOR SETTING UP NON-CONVENTIONAL ENERGY BASED POWER PROJECTS

Implementation of wind farm project



[105] http://dipp.nic.in/clear.htm

SETTING UP A WIND POWER PROJECT:

The Ministry has been issuing guidelines for wind power development since July 1995 in order to bring about balanced growth of the sector. These guidelines relate to preparation of detailed project reports, micrositing, selection of wind turbine equipment, operation & maintenance, performance evaluvation, etc. The certification requirements for wind turbines has been in place in order to ensure quality wind turbines for grid connection. A list of approved models and manufacurers is brought out by Centre for wind Energy Technology(C-WET), on a quaterly basis.[106]

If the size of the project is small, the best option is to take advantage of facilities being provided by experienced windfarm developers. The smaller investor just has to arrange for funds and reap benefits.

If the size of the project is more than 5.0MW, it is considered to follow the following the complete procedure for establishment of the project. The project kick starts with a feasibility study for the selection of competent technical consultants experienced in the field. Selection of suitable site, preferably from among those identified by government agency based on wind data monitoring or by an experienced consultant. Followed by analysis of wind data and assessment of potential at the selected site. In case wind data is not available from a near-by monitoring mast, immediate action is to install a mast for monitoring wind condition.

Detailed Project Report

[106] Annual report 2007-08, MNRE

Detailed Project Report (DPR), prepared by an expert consultancy organization should include

- Capacity of windfarm
- Mode of project financing
- Site identification finalised based on assessment that the wind potential have WPD (wind power density) more than 200 W/m2 at 50 m above ground level.
- Purchase/acquisition of land (Govt. land/Private land).

Project Implementation Stage

- Retaining services of expert consultancy organization
- Micro-siting of WEGs
- No Objection Certificate, to obtain from State Nodal Agency or the State Electricity Board/Regulatory Commission.
- Acquisition of land.
- Power Purchase Agreement with State Nodal Agency/State Electricity Board/Third Party.
- Submitting proposal for loan
- Soil testing
- Preparation of bid document, techno-commercial evaluation of bids and selection of equipment.
- Preparation of Bar chart showing project activities.
- Engaging experienced contract for site work.
- Preparatory work at site – arranging for water and electricity during construction. Creating of storage facility.

- Insurance of material in store/during erection.
- Construction of approach/internal roads.
- Erection and commissioning activities.
- Safety Certificate from the Chief Electrical Inspector to Government (CEIG) prior to commission of the grid and the windfarm.
- Training of operating and maintenance of the windfarm during erection and commissioning.
- Observation on performance of the WEGs and other equipment.
- Handing over/Taking over of the windfarm.

The same process is followed in almost all the projects involving non-conventional energy sources.

5.2.4. POLICIES OF MNES

Central Policy for Renewable Energy Development

The spread of various renewable energy technologies have been aided by a variety of policy and support measures by Government. Major policy initiatives taken to encourage private/foreign direct investment to tap energy from renewable energy sources include provision of fiscal and financial incentives under a wide range of programmes being implemented by the Ministry and simplification of procedures for private investment, including foreign direct investment, in renewable energy projects. The policy is clearly directed towards a greater thrust on over all development and promotion of renewable energy technologies and applications. The recent policy measures provide excellent opportunities for increased investment in this sector,

technology up-gradation, induction of new technologies, market-development and export promotion.

A Comprehensive Renewable Energy Policy for all round development of the sector is under preparation.

Policy measures in vogue[107]:

- A host of fiscal incentives and facilities are available to both manufacturers and users of renewable energy systems, which include: 100% accelerated depreciation for tax purposes in the first year of the installation of projects/systems.
- No excise duty on manufacture of most of the finished products. Low import tariffs for capital equipment and most of the materials and components.

  Soft loans to manufacturers and users for commercial and near commercial technologies.
- Five-year tax holiday for power generation projects. Remunerative price under alternate power purchase policy by State Government for the power generated through renewable energy systems, fed to the grid by private sector.
- Facility for Banking and wheeling of power. Facility for Third party sale of renewable energy power. Financial Incentives/Subsidies for devices with high initial cost. Involvement of women not only as beneficiaries but also for their

[107] Centre for renewable energy and environment, http://www.terienvis.nic.in/govtnotification.htm

active contribution in implementation of renewable energy programmes.

- Encouragement to NGOs and small entrepreneurs. Special thrust for renewable energy in North-Eastern region of the country. 10% of Plan funds earmarked for North-East towards enhanced and special subsidies.
- Allotment of land on long term basis at token lease rent and supply of garbage free of cost at project site by State Governments, in respect of projects on energy recovery from municipal waste.

State Government's Policy for Renewable Energy[108]

For encouraging investment by the private and public sector companies in power generation through renewable energy, a set of guidelines have been issued by the Ministry of Non-Conventional Energy Sources for consideration of the States.

As a result a number of States have announced policy packages including Wheeling, Banking, Third Party sale and Buy-Back which have been outlined. In addition some of the States are providing concession/exemption in State Sales Tax and Octroi etc.

Industrial Policy for Renewable Energy Development in India

Ministry of Non-Conventional Energy Sources is promoting medium, small, mini and micro enterprises for manufacturing and servicing of various types of renewable energy systems and devices. Industrial policy measures include:

[108] *ibid.*

Industrial clearance is not required for setting-up of renewable energy industry.

- No clearance is required from Central Electricity Authority for power generation projects upto Rs. 100 crores (Rs. 1000 million). A five year Tax holiday allowed for renewable energy power generation projects.
- Soft loan is being made available through IREDA for renewable energy equipment manufacturing.
- Facilities for promotion of export oriented units are available for renewable energy industry also.
- Financial support is available to renewable energy industries for taking up R&D projects in association with technology institutions. Power project import allowed.
- Private Sector Companies can set up enterprises to operate as licensee or generating companies.
- Customs duty concession is available for renewable energy parts/equipment, including for machinery required for renovation and modernization of power plants.
- Excise duty on a number of capital goods and instruments in the renewable energy sector has been reduced/exempted.

Foreign Investment Policy[109]

[109] *ibid.*

Following are the major features of the policy:

Foreign Investors can enter into a joint venture with an Indian partner for financial and/or technical collaboration and also for setting up of renewable energy based Power Generation Projects.

Liberalized foreign investment approval regime to facilitate foreign investment and transfer of technology through joint ventures. The proposals for up to 74% foreign equity participation in a joint venture qualifies for automatic approval.

100% foreign investment as equity is permissible with the approval of Foreign Investment Promotion Board (FIPB).

Foreign Investors can also set up a liaison office in India. Government of India is also encouraging foreign Investors to set up renewable energy based power generation projects on Built- Own and Operate basis.

6.1. GENERAL INCENTIVES IN INDIA

The diverse economy of India encompasses traditional village farming, modern agriculture, handicrafts, a wide range of modern industries and a multitude of services. India's pool of technical manpower base with an increasing disposable income and its burgeoning market have all combined to enable India emerge as a viable partner to global industry.[110]

The Government of India is making all efforts to supplement all such advantages of the country. It has made infrastructure development as one of the key area of focus. Sound and effective connectivity via rail, road, ports and air, between the Indian States and with the rest of the world, is a necessity. Along with this, efficient power supply and excellent telecommunication network plays a very important role in the country's development. Accordingly, the Government has undertaken several policy measures and incentives to attract investors into the country and provide a good quality of life to the people.

India is a land of opportunities, capable of attracting individuals, corporates, government bodies, including bilateral and multilateral institutions from diverse fields, as investors into the country. These investment opportunities are embedded in India's advantageous position on the world platform:-[111]

[110] Investment oppurtunities & incentives, Available at http://business.gov.in/investment_incentives/index.php

[111] Opportunities, Policies and Incentives, http://business.gov.in/investment_incentives/opportunites_policies.php

- A three tier democratic system which ensures a stable policy environment.
- A well developed administrative and an independent judicial system.
- A vast geography endowed with diverse topography making India a repository of resources.
- A diverse cultural heritage which puts Indians at ease with the people from other cultures and provides a tolerant environment for the investors.
- One of the largest producers of agricultural commodities ensuring self-sufficiency.
- Manufacturing capability spanning almost all the segments of the economy.
- An unparallel resource of educated, hard-working, skilled manpower including engineers, managerial personnel, accountants and lawyers.
- A rapidly growing consumer base making it one of the world's largest markets for manufactured goods and services.
- A dynamic and robust financial system consisting of a comprehensive banking network, a number of National and State level financial institutions as well as a vibrant capital market. It is supported by a well laid out package of monetary and fiscal incentives as well as liberal and progressive policies.

- Large and diversified infrastructure spreading across the nation and providing easy access to the markets of other nations.

- A well-developed research and development (R&D) set up extending to diverse fields.

- Accounting standards similar to those followed internationally.

- A policy framework that provides clear guidelines for freedom of entry and location, choice of technology, production, repatriation of capital, dividends, etc., which are specifically aimed at enhancing the flow of investment.

- Sound economic fundamentals.

6.2. POWER SECTOR INCENTIVES

Undertakings engaged in prescribed power projects are eligible for tax deduction of profits from relevant business as below[112]: -

- 100% tax deduction for 10 consecutive years in a block of 20 years to undertakings engaged in developing / operating and maintaining / developing, operating and maintaining infrastructure facilities like roads, bridges, rail systems, highway projects, water supply projects, water treatment systems, irrigation projects, sanitation and sewerage systems or solid waste management system.

[112] Indian Taxation System, http://www.iornet.com/countryprofile/india/taxation.htm
Also Destination India- A brief overview of Tax and Regulatory framework, Price water house coopers, Bangalore.

- 100% tax deduction for 10 years in a block of 15 years to undertakings involved in developing / operating and maintaining, / developing, operating and maintaining, ports, airports, inland waterways or inland ports. The Finance Act, 2007 has extended similar benefit to navigational channel in the sea. A similar deduction is also available to undertakings set up before March 31, 2010 for generation/ generation and distribution of power.
- The Finance Act, 2007 has provided a 10 year tax holiday to any undertaking carrying on business of laying and operating a cross country natural gas distribution network, including pipelines and storage facilities being an integral part of such network, subject to certain specified conditions. The deduction would be available for 10 consecutive years in a block of 15 years beginning with year in which the undertaking lays and begins to operate the cross country natural gas distribution network.

6.3. SUB SECTOR WISE INCENTIVES[113]

Wind Energy

Fiscal incentives being offered by the Central Government include tax holidays, concessional customs tariffs and 80% accelerated depreciation. The present policies of fiscal and financial incentives have generated significant interest in the private sector.

[113] New Energy India, Available at http://www.newenergyindia.org/Policy%20Page.htm

• *Direct taxes – 80 per cent depreciation in the first year of installation of a project.*

• *Tax holiday for 10 years.*

Guidelines were issued by the Ministry and IREDA (Indian Renewable Energy Development Agency) to all concerned States for announcement of polices relating to wheeling, banking, third party sale and buy back of power at a minimum purchase price of Rs 2.25 (base year 1994-95), with 5% annual escalation. Nine potential States have already announced polices for private sector participation. Other States have been requested to announce their policies. With the restructuring of the power sector and with the formation of Central Electricity Regulatory Commission (CERC) and State Electricity Regulatory commission (SERC), they are now fixing power tariffs and allied conditions.

Andhra Pradesh Electricity Regulatory Commission, Maharashtra Electricity regulatory Commission, Karnataka Electricity Regulatory Commission and Madhya Pradesh Electricity Regulatory Commission have declared the policies for wind power purchase.

The Maharashtra State Electricity Regulatory Commission (MERC) has passed order for making purchase of electricity generated by renewable sources obligatory for all utilities in Maharashtra. This Renewable energy Purchase Obligation (RPO) is applicable from financial year 2004-05.

Karnataka Electricity Regulatory Commission has also directed that each distribution licensee shall purchase a minimum quantum of 5% and maximum quantum of 10% electricity annually from renewable sources expressed as a percentage of its total consumption.

Madhya Pradesh Electricty Regulatory Commission has fixed a target of 0.5% of total annual consumption in the area of supply for all licensees subject to availability as minimum purchase requirement from wind energy. Orissa Electricity Regulatory Commission has ordered to Power Grid Corporation and power distribution companies to buy 200 million units of green power during financial year 2005-06 at a cost of exceeding the highest cost of thermal power in eastern region.

Solar Energy

- Solar photovoltaic Market Development Programme

Accreted Depreciation : 80% on the first year.

- Solar Thermal Programme

Interest Subsidy is available to the end users for both domestic and commercial application.vDepreciation : 80% on the first year.

- Solar water pumping programme

Accreted Depreciation : 80% on the first year.

The Ministry has announced a new initiative on development and demonstration of mega-watt capacity grid interactive solar power generation in January 2008, with a view to harness the vast solar energy potential in the country for power generation. Under the programme, the Ministry will support grid interactive solar power generation projects up to a maximum capacity of 50 MW. The registered companies, as project developers, would be eligible to set up solar power projects on build, own, operate basis. Proposals from each project developer with a maximum aggregate capacity of 5 MW, either

through a single project or multiple projects of a minimum capacity of 1 MW each, would be considered.

The Ministry will provide generation based incentive up to Rs.12 per KWh for solar photovoltaic power and Rs. 10 per kWh for solar thermal power fed to the grid by the solar power project developers, after taking in to account the tariff provided by the SERC or the utility. The concerned utility and the state Nodal Agency will be inviolved in implementation and monitoring of the project.

Biomass

- Bio power cogeneration

FISCAL INCENTIVES AVAILABLE FOR BIOMASS POWER GENERATION

Item	**Description**
Income Tax	
1. Depreciation	100 % depreciation in the first year can be claimed for the following power generation equipment 1. Fluidized Bed Boilers 2. Back pressure, pass-out, controlled extraction, extraction and condensing turbine for Power generation with boilers 3. High efficiency boilers

	4. Waste heat recovery equipment
2. Tax Holiday	10 year tax holiday
Customs Duty	Duty leviable for NRSE power projects of less than 50 MW capacity (under Project Import Category) is 20 % ad valorum. This covers machinery and equipment components required for generation of electric power.
Central Excise Duty	Exempted for renewable energy devices, including raw materials, components and assemblies.
Central Sales Tax	-
General Sales Tax	Exemption is available in certain States .

In addition to all these incentives by the Central government, various state governments have also given incentives to the project developers.

Energy from Waste

- Commercial Projects: Financial assistance as interest subsidy for reducing rates of interest
- Demonstration Project: Financial assistance on capital cost of the project

- Power Generation at Sewage Treatment Plants: Financial assistance on incremental cost for generation of power from biogas

6.4. STATE SPECIFIC INCENTIVES[114]

- A number of states have announced policy packages including banking, third party sale and buy-back. Most states have declared buyback rates with some escalation for each subsequent year.
- Some states are providing concessions or exemption in state sales tax. These rates vary widely from state to state and between different technologies.
- Fourteen states have so far announced policies for the purchase and support of electrical energy generated from various RE sources.
- Maharashtra has set up a "green energy fund" for promoting renewable projects.
- Eleven state regulators have under the National Tariff Policy 2006 passed orders for a minimum offtake of renewable power by distribution licencees (called RPOs; renewable energy purchase obligations).

State	Renewable Energy Purchase Obligation
Andhra Pradesh	Minimum 5% from 2005-06 to 2007-08 (including a minimum 0.5 per cent from wind).
Madhya Pradesh	0.5%

[114] *ibid.*

Karnataka	Minimum 5% and maximum of 10%
Gujarat	Minimum specification: - 2006-07: 1% - 2007-08: 1% - 2008-09: 2%
Rajasthan	DISCOMS to enter into PPAs up to 400 MW with renewable energy sources (including PPAs signed under Policy 1999, Policy 2000, and Policy 2003)
Orissa	To buy 200 million units of green power during 2006-07 at a cost not exceeding the highest cost of thermal power in eastern region
Maharastra	Target 250 MW from biomass power projects
Tamil Nadu	10% of total power consumption (still a proposal not an order)
Haryana	Minimum percentage: - 2007-08: 3% - 2008-09: 5% - 2009-10 & thereafter: 10%
West Bengal	RPOs vary for different licensees: - WBSEB: 1.9% in 2006-07 and 3.8% in 2007-08 - CESC: 1.02% in 2006-07 and 2.03% in 2007-

	08 - Durgapur Projects Ltd: 0.72% in 2006-07 and 1.4% in 2007-08 - DPSC Ltd: 0.43% in 2006-07 and 0.95% in 2007-08
Kerala	Minimum RPO 5%, which will include 2% from SHP, 2% from wind and 1% from sources other than SHP and wind

Source: Ministry of New and Renewable Energy, India. [115]

[115] *ibid.*

CONCLUSION

The Indian economy is booming, with rates of Gross Domestic Product (GDP) growth exceeding 8% every year since 2003/04.[116] This ongoing growth is due to rapidly developing services and manufacturing sectors, increasing consumer demand (largely driven by increased spending by India's middle class) and government commitments to rejuvenate the agricultural sector and improve the economic conditions of India's rural population. Construction is the second largest economic activity in India after agriculture, and has been growing rapidly. The production of industrial machinery has also been on the rise – and the increasing flow of goods has spurred increases in rail, road and port traffic, necessitating further infrastructure improvements.

In the fiscal year ending March 2008, India's GDP grew by more than 9%. This robust rate of expansion was initially forecast to continue in the 2008-2009 fiscal year.[117] In summer 2008, however, the combined impact of slowing Indian consumption, a higher domestic cost of capital and reduced capital access from international capital markets raised concerns by some analysts that the rate of growth might be slowing.[118] In October 2008, India's Prime Minister, Mr. Manmohan Singh, affirmed the Government's view that a rate of growth of 7-7.5% remains realistic, even given the global credit crunch, and assured observers that the country's Government will take action if necessary to support businesses and the financial markets.[119] Mr. Singh has

[116] Destination India- A brief overview of Tax and Regulatory framework, Price water house coopers, Bangalore.

[117] *ibid.*

[118] *ibid.*

[119] *ibid.*

also singled out infrastructure investment as particularly vital. Indeed, even with a somewhat slower rate of growth, the Indian economy is still expanding significantly, and substantial investment in infrastructure continues to be required in order to sustain India's economic progress. The country's capacity to absorb and benefit from new technology and industries depends on the availability, quality and efficiency of more basic forms of infrastructure including energy, water and land transportation. In some areas, roads, rail lines, ports and airports are already operating at capacity, so expansion is a necessary prerequisite to further economic growth. The Indian Government recognises this imperative. As per the Eleventh Five Year Plan, more than US$500 billion worth of investment is planned to flow into India's infrastructure by 2012.[120] Construction projects account for a substantial portion of the proposed investments, making the E&C sector one of the biggest beneficiaries of the infrastructure boom in India. The regulatory environment is relaxing to encourage further foreign direct investment (FDI). Private sector participation is integral to these plans. PPPs have been identified as the most suitable mode for the implementation of projects – and indeed, are rapidly becoming the funding norm. Their share of the total planned infrastructure improvements is projected to be around 30% (US$150 billion). Power and road projects top the list, and other transportation sectors such as railways, ports, and airports are also targeted for major investments.[121] Companies looking to capitalise on the situation need to plan their strategy for entering the market carefully. Understanding the local market, including selecting complementary local partners, is vital. Tax optimisation is a key cost

[120] *ibid.*

[121] *Ibid.*

component – while substantial tax benefits are provided for infrastructure projects, developers need to be savvy about structuring their contracts. Good tax planning can have a potentially decisive impact, especially in bidding situations, and help to avoid unnecessary litigation later.

Development of Renewable Energy needs consolidated effort from all stakeholders including developers, manufacturers, investors, policy makers & regulators to deal with various issues. Governments have to adopt a number of strategies to improve the competitiveness of renewable energy and make it commercially viable. Since Renewable energy is environmentally benign, it can substantially reduce greenhouse gases and other pollutants. It increases diversity of energy supplies and can replace diminishing fossil fuel resources in the long run. Wind energy being commercially competitive needs additional impetus to increase renewable energy penetration in global installed power generating capacity.

A recent study by consultancy major McKinsey estimates India's power demand to increase from the present 120 gigawatt (GW) to 315 GW–335 GW by 2017, if India continues to grow at an average of 8 per cent over the next 10 years. This would require a five- to ten-fold rise in power production, entailing investments worth US$ 600 billion over the next ten years. [122]

To feed its rapidly growing economy, India is planning to get an additional 60,000 MW of electricity from various hydro-power projects by the end of 2025. [123]

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[122] http://www.ibef.org/economy/power.aspx

[123] *ibid.*

The Ministry of Non-Conventional Energy Sources has been implementing comprehensive programmes for the development and utilization of various renewable energy sources in the country. As a result of efforts made during the past quarter century, a number of technologies and devices have been developed and have become commercially available. These include biogas plants, improved wood stoves, solar water heaters, solar cookers, solar lanterns, street lights, pumps, wind electric generators, water-pumping wind mills, biomass gasifiers, and small hydro-electric generators. Energy technologies for the future such as hydrogen, fuel cells, and bio-fuels are being actively developed.

India is implementing one of the world's largest programmes in renewable energy. The country ranks second in the world in biogas utilization and fifth in wind power and photovoltaic production. Renewable sources already contribute to about 5% of the total power generating capacity in the country.[124] Although it may not always be easy to navigate the plethora of views, opinions and perceptions expressed by various local stakeholders, a vast opportunity exists for foreign contracting companies looking to invest in Indian infrastructure. Already, a number of contractors from Europe, Australia, China, Malaysia and Korea have made their presence felt in India. Further, many E&C companies, particularly from Japan, Spain, France and the UK are also now aggressively looking out for opportunities to enter India for business. Overall, the opportunities to develop a significant business in India are extremely promising for E&C companies, if they have carefully selected strong local partners, structured contracts sensibly to maximise tax benefits

[124]Booklet on Energy, Ministry of Non conventional Energy, Government of India

where appropriate, and taken a long-term, sustainable perspective. Foreign companies who do not acknowledge the opportunity in good time may miss out on a critical opportunity to establish a long-term presence in one of the world's largest growth markets.

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