

# Question Paper

## Professional Ethics and Case Studies (CFA660): January 2009

### Section A: Professional Ethics (20 Marks)

- This section consists of questions with serial number 1 - 2.
- Answer all questions.
- Marks are indicated against each question.
- Do not spend more than 25 - 30 minutes on Section A.

1. With the growing interest in ethics, it is important to judge the ethical nature of organizations. Various theories provide a framework for judging the ethical nature of organizations. In this context, explain the theory of corporate moral excellence. [<Answer>](#)  
( 10 marks)
2. Strategic management involves decisions concerning all levels of the management. While making strategies, organizations may encounter various ethical issues. In light of this, discuss the various principles underlying an ethical approach to strategic management. [<Answer>](#)  
( 10 marks)

**END OF SECTION A**

## Professional Ethics and Case Studies (CFA660): January 2009

### Section B: Case Study (80 Marks)

- This section consists of questions with serial number 3 – 8.
- Answer all questions.
- Marks are indicated against each question.
- Do not spend more than 140 - 150 minutes on Section B.

### Case Study<sup>\*</sup>

3. The wind energy sector is expected to have huge growth potential in the future. In this regard, explain the factors contributing to the growth of wind energy sector. [<Answer>](#)  
(12marks)
4. As discussed in the case study, wind turbines have become familiar around the world for a wide variety of reasons including their economic, environmental, and social benefits. Explain. [<Answer>](#)  
(15marks)

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<sup>\*</sup> The above case is prepared only for the purpose of examination and not to illustrate either effective or ineffective performance of the fund. The case contains real information adapted and combined with other information to generate discussion or analysis on the desired topics.

5. The data given below relates to monthly stock prices of Suzlon Energy Limited., for the years 2006 and 2007 respectively.

[<Answer>](#)

(Rs.)

Months	Closing Price (2006)	Closing Price (2007)
January	1,163.70	1,142.35
February	1,093.30	1,037.05
March	1,302.80	1,001.95
April	1,282.45	1,187.65
May	976.25	1,285.35
June	1,048.00	1,493.55
July	1,080.60	1,271.25
August	1,203.35	1,265.35
September	1,236.05	1,446.70
October	1,309.55	1,973.65
November	1,446.65	1,895.95
December	1,304.35	1,935.75

You are **required** to observe whether the changes in stock prices are independent or not, using auto-correlation test. (12marks)

6. Ms. Sheetal, a Chartered Financial Analyst, has opined that the Suzlon Energy Limited (SEL) can be valued using Relative Valuation Model based on the following parameters:

[<Answer>](#)

Parameters	Weights
Price to Earning Ratio	0.25
Price to Book Value Ratio	0.70
Price to Sales Ratio	0.05

Following is the information pertaining to its peer group:

					(Rs.)
Measures of relative valuation	SNS Textiles	Indus Fila	Grabal Alok	Shri Lakshmi	Sarla Performance
Sales per Share	2.26	162.06	53.58	447.13	161.29
Book Value per Share	0.14	67.83	53.58	115.38	86.53
Earning per Share	0.16	13.49	3.24	25.22	17.58
Current Market Price per Share	3.79	64.5	49.25	30.3	48.5

Share price of SEL as on 31<sup>st</sup> March, 2007 was Rs.1001.95.

Using **Annexures II and III**, calculate the value per share of SEL as on 31<sup>st</sup> March 2007 based on Relative Valuation Model and comment on the same. (15marks)

7. Wind energy market is growing at the fastest rate among the other renewable energies. SEL has earned ISO 9001:2000 certifications for its design, operation and maintenance services. In light of this, discuss the opportunities for the SEL in global wind energy industry. (14marks)
8. The activities of SEL are diversified in domestic as well as international markets, from sourcing of inputs to marketing of finished goods. Owing to the various global and domestic dynamics, explain the various risks to which SEL is exposed to. (12marks)

[<Answer>](#)

[<Answer>](#)

#### Suzlon Energy Limited (SEL)

*“The increasing energy crisis and climate change concerns have made renewable power a key priority for people,*

*governments and nations. And with energy security firmly on every national agenda – wind energy is poised to continue to grow strongly worldwide.”*

**– Mr. Tulsi Tanti, Chairman, Suzlon Energy**

The global economy is struggling to sustain growth with oil above US\$ 120 per barrel, which is expected to cross US\$200 in the next two years. In the backdrop alternative energy sources have achieved significance. Wind power being a cleaner one such alternative, it has attracted the interest of many governments and environmentalists.

The wind power is expected to grow at 27 percent per annum for the next 10-12 years and the total capacity would reach 2 million MW in 2020 from the present 96000 MW. Global players like Vestas, Nordex, Gamesa, Clippera and GE are very aggressive to capture this growth in wind power. Suzlon Energy Ltd. (Suzlon), the world’s fifth leading wind turbine maker, with 10.5% of global market share is leaving no stone unturned to compete with these players.

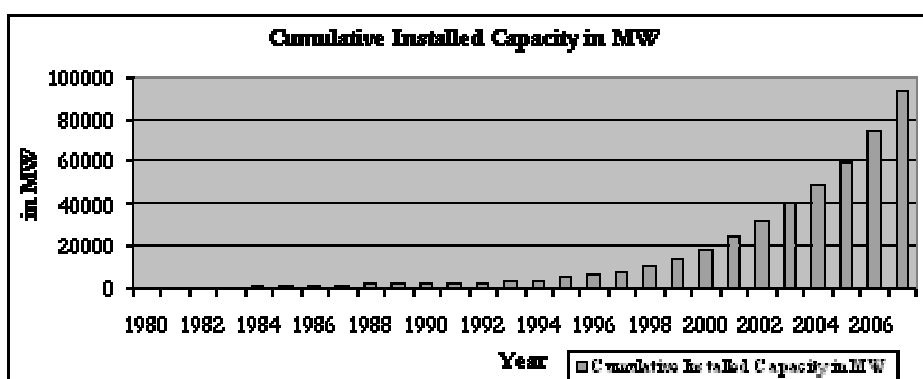
On June 6th, 2008, Suzlon announced the acquisition of Areva’s total stake of approx 30% in REpower Systems AG of Germany taking its total stake to 66 percent. The acquisition will give Suzlon the much needed access to REpower technology in wind turbine, which will be very helpful in tapping the fast growing market and in competing with global majors.

### **Global Scenario**

Apart from the increasing oil prices, global environmentalists are worried about the effects of global warming, which has drawn the attention of many governments towards green energy and renewable sources. Within the renewable energy space, wind power offers by far the best combination of economics and scalability, and is expected to contribute to a large proportion of the global push towards renewable energy sources. The world wind energy installation has come a long way since 1980, when it was 10 MW and was produced by relatively smaller turbines with a capacity of 20-30KW. Over the years, it increased, on an average, over 30 percent with support from various governments in Europe and across the world. By the end of 2007, it had a capacity of 94122 MW and the turbines technology has also reached new highs. At present, the minimum capacity of a wind turbine is at 700 KW, with some models approaching 5 MW capacity. Presently, global targets for renewable energy are increasing with Europe aiming for 20% of electricity generation through this mode by 2020 followed by the US and China at 15%.

In 2007, wind power capacity increased by a record-breaking 20,000 MW, bringing the world total to 94,100 MW – enough to satisfy the residential electricity needs of 150 million people. Driven by concerns regarding climate change and energy security, one in every three countries now generates a portion of its electricity from wind with 13 countries each exceeding 1,000 MW of installed wind electricity-generating capacity. Europe is the largest producer of wind energy with an installed capacity of 57100 MW, which is enough to supply power to 90 million residents. It accounts for four percent of Europe’s electricity demand. In 2007, it has added 8600 MW of wind power accounting for 43 percent of total global installations.

**Figure 1: Total Generation Capacity of Wind Power of World from 1991 to 2007**



*Source: wind power statistics.*

Individually, USA added highest capacity in 2007, with 5400 MW. Installations in the fourth quarter of 2007 alone exceeded the figure for all of 2006, and the United States is on track to overtake Germany as the leader in installed wind power by the end of 2009. The recent growth in wind power farms is mainly due to extension of wind production tax credit under 2005 Energy Policy Act. At the national level, wind farm proposals exceed an astounding 100,000 MW, roughly six times the current installed capacity.

In terms of wind power installations in 2007, Spain, China and India follow the US. It is expected that China will surpass India in 2009 in terms of installed capacity. China has already surpassed its 2010 target of 5000 MW. The Renewable Energy Law (REL), which came into force on January 1, 2006, is encouraging wind energy

growth in China. The REL was established to help China meet its goal of generating 15 percent of the country's energy from renewables by 2020. It mandates power producers to increase their ownership of non-hydro renewables to 3 percent by 2010 and 8 percent by 2020. It has also set to reach a target of 30,000 MW by 2020. The Chinese Renewable Energy Industry Association projects that with a feed-in tariff and greater investment in offshore wind farms, the wind power installations in China may well exceed four times that target.

The next big target for wind power installations is – near-shore and offshore installations, where the potential is very high.

Near-shore turbine installations are on land within three kilometers of a shoreline or on water within ten kilometers of land. Even though there are no significant near-shore installations anywhere in the world, scientists are conducting studies to make it viable. Wind farm developers in Europe are now looking to these near-shore sites where long stretches of open sea provide higher average wind speeds, where access to consumers on shore is relatively easy, and where the masts' visual impact on the landscape is minimized. However, wind speeds are particularly complex in this transition region, where large temperature differences between the land and the water set up strong convective winds. Understanding the complex patterns of air movement is important because near-shore sites can be less expensive to develop than sites further offshore.

Any installation in water that is beyond 10 kilometers will come under offshore. Even though the cost of installing offshore turbines is comparatively higher than on-shore installations, the higher load factor will offset their cost, thereby reducing cost of energy produced. As water has less surface roughness than land (especially deeper water), the average wind speed is usually considerably higher over open water, on the capacity utilization front, utilization rates are considerably higher than onshore and near-shore locations.

At present, offshore wind plants account for 1170 MW, with Denmark leading with 426 megawatts (MW) of installed offshore wind power capacity, followed by the United Kingdom (UK), Sweden, the Netherlands, and Finland. In 2008, the UK is expected to overtake Denmark for the top spot and it has plans to use offshore wind turbines to generate enough power to light every home in the UK by 2020. On the other hand, Germany is poised to move into the top five. Wind plants with more than 1,200 MW capacity presently under construction worldwide, primarily in Europe, offshore wind capacity is expected to more than double by 2009. According to the report published by US Department of Energy, Massachusetts Technology Collaborative and General Electric, US, have a wind power potential of 900000 MW.

Wind turbines of all sizes have become a familiar sight around the world for a wide variety of reasons, including their economic, environmental, and social benefits. The potential for wind energy is immense, and experts suggest wind power can supply up to 20% of U.S. and world electricity. Nevertheless, the United States currently produces less than 1% of our electricity from wind. The advantages and disadvantages of wind energy are detailed here to help you decide what the future of wind should be in the United States.

Wind energy is rapidly taking center stage in the new energy economy with ever increasing concerns over the changes in the global climate and energy security. Unlike conventional energy sources, electricity generation from wind does not release greenhouse gases associated with global warming. Wind also offers long-term energy security, since it is inexhaustible, widely distributed, and free. If the present 27-percent annual growth rate of installed wind power capacity is maintained, total capacity in 2020 will hit 2 million MW, and combined with aggressive economic incentives, it could reach 3 million MW by that date, which would be 30 times as much as is available today.

### **Indian Power Industry**

India expects to grow at 8-9 percent for the next 15 years. To support this growth of economy, the country should have to increase its power generation capacity to 302000 MW in the next ten years. By the year 2031, the expected power generation capacity would be at 800000 MW. However, the increasing oil prices and environmental issues have drawn the attention of policy makers towards alternative sources of power, in which wind power achieved major significance and is expected to play major role in powering the country in future. Against the backdrop it is believed that it require a complete understanding of the Indian power industry.

The Government of India has laid much emphasis on the development of power sector since independence; accordingly the installed capacity has increased from 1713MW in 1950 to 143061.01 MW as on 31st March 2008, registering a 83-fold increase in power generation capacity.

The total installed capacity as on 30th April 2008 stood at 143311.01 MW. Electricity generation in India has increased from 5.4 billion units in 1950 to 624 billion units in 2006-07 registering a 115-fold increase. Currently, India stands fifth in terms of installed capacity. With growing generation capacity, the transmission and distribution capacities too are growing. The present transmission and distribution capacity of India is 5.2 million circuit Km, which is the third largest in the world. Despite heavy investments in generation, transmission and distribution segments, the per capita consumption of electricity in India is far less than world average. The per capita consumption of electricity in India during 2007-08 was at 704.2 kwh per year against the world's average of 2596 kwh.

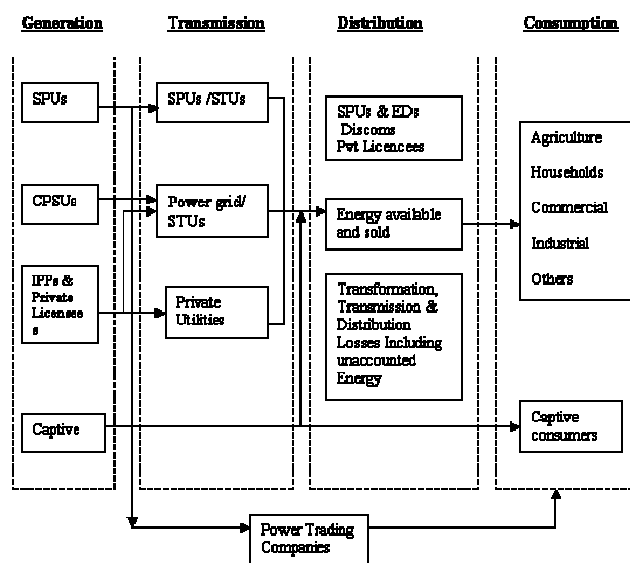
Electricity falls within the jurisdiction of the Central government and the State governments. In many states, the electricity boards are vertically integrated entities, majority of which are now trifurcated into Generation, Transmission

and Distribution companies and these are state owned. However, to meet the targeted 1000 kwh per capita availability of power by 2012, the central government is encouraging private players in power generation. States like Delhi, Orissa went a step further by privatizing the distribution of power in these states. In spite of Government of India's best efforts, India is still facing severe power shortage. For the first nine months of FY 07-08, the country faced power shortage of 9.9 percent and peak demand power shortage of 16.6 percent as against a power shortage of 9.8 percent and a peak demand shortage of 13.5 percent in 2006-07. In order to accommodate an 8-9 percent growth of economy, the country should have to increase its power generation capacity to 302000 MW in the next ten years. By the year 2031, the expected power generation capacity would be at 800000 MW.

### Industry Value Chain

The value chain in the industry begins with generation followed by transmission and distribution to end customers like farmers, industries, domestic customers.

**Figure 2: Value Chain**



Source: Icfai Research Team.

### Industry Segments

Considering the importance of generation, transmission and distribution in the industry, an understanding of these segments is necessary to analyse the position of the industry.

#### 1. Generation

In this segment/stage electricity is generated using four different types of sources namely, water, fossil fuels, uranium, and renewable resources. Based on the type of resource used to generate electricity, there are four types of generation methods namely, Hydro, Thermal, Nuclear and Renewable Energy Sources. In Hydro, we use water to produce electricity. In Thermal, we use fossil fuels like coal, natural gas and diesel. In nuclear, we use uranium whereas in Renewable energy sources, we produce electricity by using wind and sunlight (solar). In India, as on March 31, 2007, nearly 65 percent of electricity was produced using fossil fuels, while hydro generation contributes 26 percent to the total power production. The remaining is by nuclear and renewable sources. Among these alternatives power generation through hydro is the cheapest one followed by wind and thermal. The utilization capacity in power sector is calculated by using Plant Load Factor (PLF). Historically, India has a low PLF; however, for the last few years it has been improving at a steady rate. This has increased from 64.7 percent in 1996-97 to 78.61 percent in 2007-08. Among the three sectors namely, central sector, state sector and Private sector, private sector has the highest PLF with 90.79 percent followed by central sector with 86.74 percent while the state sector has least with 71.89 percent.

In India, the following players generate electricity:

- Central utilities such as NTPC, NHPC, Nuclear Power Corporation, Damodar Valley Corporation and NEEPCO.
- State Electricity Boards which are state-owned utilities. A few states have corporatized their SEBs. These states are:
  - Orissa – OPGC/OHPC
  - Haryana – Haryana Vidyut Utpadan Nigam (HVUN)

- Andhra Pradesh – AP Genco
- Uttar Pradesh – UP Thermal Power Corporation & UP Hydel Power Corporation
- Karnataka – Karnataka Power Corporation Limited
- Independent and Captive Power projects (ICP) like Tata Power
- Licensees such as Reliance energy and CESC.

## 2. Transmission

Transmission is the bulk transfer of electricity from the generation plant or location to the place of local distributors or sub-stations near populated areas. It serves as a connecting link between generation plants and sub-stations. In India, the transmission and distribution system is a three-tier structure comprising regional grids, state grids, and distribution networks.

State Electricity Boards (SEBs) or state governments through the SEBs, mostly own and operate the distribution network and the state grids. Most of the inter-state transmission links are owned and operated by Power Grid Corporation of India Limited (PGCIL). The bulk transmission network has increased from 3078 Ckm in 1950 to more than 250000 Ckm at present. In order to facilitate the transfer of power between neighboring states, state grids are interconnected to form five regional grids. These regional grids facilitate transfer of power from a power-surplus state to a power-deficit state and it is anticipated that these grids will be gradually integrated to form a national grid. At present, the national grid has a capacity of 9500 MW and PGCIL plans to achieve national grid capacity of 37000 MW by fiscal 2012.

In the transmission sector, a few of the states have unbundled their transmission and corporatized their entity.

- Orissa – Grid Corporation
- Andhra Pradesh – APTransco
- Haryana – Haryana Vidyut Prasaran Nigam (HVPN)
- Uttar Pradesh – UP Power Corporation.

In all other states, transmission is still under the control of SEBs except the five cities where licensees control power transmission.

## 3. Distribution

Distribution pertains to receipt of bulk power from the transmission facilities, and its supply to end-consumers within a (Contiguous) local geographical unit at lower voltage levels. The entities in the unit constitute the retail interface of the industry and address the supply, quality, billing and issues typical to the end consumer. The annual loss of the power distribution system is Rs.4,70,000 million, which is 33% of the average investment required in this sector in the 11th Plan period.

State Electricity Boards, except in Delhi and Orissa, mainly control the distribution system where power distribution has been entrusted to the private sector. Orissa has divided its distribution network into four zones – Wesco, Nesco, Southco and Cesco. BSES (presently Reliance Energy) has a 51% stake in the first 3 and AES has a 51% stake in the last. GRIDCO (Grid Corporation of Orissa Limited) holds the remaining stake. In 2002, the Delhi government privatized the distribution through competitive bidding to reduce transmission losses. While BSES got two zones namely, Central-East & South-West Delhi and Tata Power got North, North-West Delhi. In all other states, distribution is under the control of SEBs except the 5 cities where licensees control the distribution of power.

Compared to states where government private players control distribution, the states with private distribution have been able to reduce T&D losses. In Delhi, the T&D losses were reduced to around 26 percent compared to national average of 33 percent. In Orissa, the billing rate has improved by 50 percent in the last three years.

### Organized vs. Unorganized

The Indian power industry is a highly organized sector. Entities owned by state and central governments 86 percent of power generation under their control. NTPC, the largest power company has 19.1 percent share. Even after liberalization of power sector in 1991, the private sector controls only 14 percent of total capacity. In the private sector, Tata Power Company Ltd. (TPCL) controls 11.49 percent of the installed capacity. Low share of private sector is mainly due to regulatory hurdles like, getting power purchase contracts from the electricity boards, access to raw materials like coal (which is under government control), huge land requirement etc. While acquisition of land is related to some local issues like displacement of people and their rehabilitation, the delay in power purchase contracts relates to inadequate provisions and lack of clarity in government regulations, which is major hurdle for a private player to start power generation. This aspect is clearly visible in the hydro electricity projects. Although private sector is quite keen to enter hydro projects in a big way (several private companies have already secured a number of potential sites from State governments), actual investments have been slow mainly due to lack of a framework enabling them to enter into Power Purchase Agreements with utilities and achieving financial closure. The private sector contribution is mainly from

independent power producers and captive power producers. The contribution from captive power producers to state grid is more than that of IPPs. The significant players in private sector are Tata Power and Reliance Energy.

However, when it comes to wind power the sector is highly unorganized with many companies generating wind energy. Since 2003, however, the entry of power majors like NTPC, Tata Power and others into the wind power sector saw it shift towards organized industry. By the end of 2007, Baltoda group emerged as the largest wind producer with an installed capacity of 191.4 MW. When it comes to wind turbine manufacturers, Suzlon Energy dominates with more than 50 percent market share.

Power transmission in India is almost controlled by state and central entities. In fiscal 2006, the Government of India implemented a scheme under the Electricity Act to invite private sector investment in major transmission projects. The private participants are allowed to provide transmission services on a 'built own and operate basis'. The Government of India has recognized 14 projects to be implemented on "built own and operate basis".

The distribution network and the state grids are mostly owned and operated by SEBs or state governments through SEBs. In March 2003, the government launched Accelerated Power Development and Reforms Program (APDRP) to accelerate distributional reforms. Subsequently, 22 states corporatized their SEBs while Delhi and Orissa are two states where private companies oversee power distribution. Additionally, Tata Power Limited, CESC Limited, Reliance Energy Limited, AEC Torrent Power Limited, SEC Torrent Power Limited and Noida Power Company Limited own and operate distribution networks in their respective license areas.

### **Key Players**

The major players currently operating in the Indian power sector are: NTPC (National Thermal Power Company) Nuclear Power Corporation of India Limited, North Eastern Electric Power Corporation Limited, Damodar Valley Corporation, Power Grid Corporation of India, Reliance Energy Limited, and Tata Power. Among these NTPC contributed 28.50% of the total power generation of the country during 2006-07.

### **Regulations Norms**

Despite public and private sector participation, experts were of the opinion that the role of government is the determinant in providing direction to the power industry; keeping this in view government has introduced certain new regulations to meet its targets for power industry.

### **Electricity Act, 2003**

In recent years, the Government has taken significant steps to restructure the power sector and to attract private and foreign investments. The most important reforms have been the introduction of the Electricity Act, which has modified the legal framework governing the electricity sector and has been designed to alleviate many of the problems confronting India's power sector. The Electricity Act is a central legislation and seeks to replace the multiple legislations that governed the Indian electricity sector. The Electricity Act consolidates all the existing legislations. The salient features of this policy are as stated hereunder:

- Access to electricity: Power would be available for all households in the next five years;
- Availability of power: Demand to be fully met by 2012;
- Supply of reliable and quality power;
- Per capita availability of electricity to be increased to over 1000 units by 2012;
- Minimum lifeline consumption of 1 unit/household/day as a merit good by year 2012;
- Financial turnaround and commercial viability of the electricity sector.

### **Distribution Reforms**

The reforms in Distribution are to bring about efficiency as well as improve the financial health of the power sector. The Government of India has approved a scheme called, "Accelerated Power Development and Reforms Program (APDRP)" in March 2003 to accelerate distribution sector reforms.

The main objectives of the APDRP program are to:

- Reduce Aggregate Technical & Commercial (AT&C) losses;
- Bring about commercial viability in the power sector;
- Reduce outages and interruptions; and
- Increase consumer satisfaction.

### **Regulatory Changes**

- In order to facilitate FDI, automatic approval (RBI route) for 100% 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.

- Section 14 of 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 Central Electricity Authority under section 53.

#### **Policy Incentives**

- Hundred percent foreign equity participation is allowed under the automatic approval route in all segments of the industry (except atomic energy).
- Generation and distribution power projects of any type and size are allowed.
- Electricity Act, 2003, allows trading in power and provides for further deregulation.
- A renewable license period of 30 years has been set.
- Return on equity up to 16 percent is assured at 68.5 percent PLF for thermal power plants. Similar incentives are provided for hydroelectric power projects too.
- Import duty at a concessional rate of 20 percent has been set for import of equipment.
- The government allows a 5-year tax holiday for power generating projects with an additional five years in which a deduction of 30 percent taxable profits is allowed.

#### **Technology**

##### **Wind Energy**

Wind energy is future power. There are no emissions and no pollutants. Wind power generation is expected to increase to meet rising energy demand and cut its reliance on coal and costly oil. The wind power generator capacity rose by 45 percent to 5,340 megawatts in the year March 2006. Big industrial units like state-run Oil and Natural Gas Corporation and Indian Oil Corporation are now eager to set up wind farms, which attract hefty tax breaks. Wind energy added nearly 2,000 MW in the previous year. It is expected that by next year we will have 10,000 megawatts generated from wind power. Electricity produced from wind is currently costlier than that produced from gas, thermal or hydro plants, but tax breaks, lower equipment import duties, and cheap loans keep prices competitive.

India allows 100 percent investment in wind projects to be written off against tax over a period of two years. With the subsidies, the cost of wind generation ranges from 2.50 to 3.50 rupees per unit, or kilowatt-hour, on par with thermal electricity generation. Wind power works out cheaper than conventional energy over the long-term due to almost non-existent running costs. It pays in the long-term since there are no recurring costs unlike thermal power, which requires a constant fuel supply. The subsidies and a power-starved market have attracted foreign firms such as Danish NEG Micon, the world's biggest wind turbine maker Vestas, Germany's Enercon GmbH, and local player Suzlon.

India has the potential to produce 45,000 megawatts of wind power, and the government has identified 210 locations where farms can be installed, and is continuing its search for more locations. Clean energy such as wind, biogas and solar energy offer an attractive option for India, which imports 70 percent of its crude oil needs, at a cost of more than \$40 billion a year.

The Ministry of Non-conventional Energy estimates that a 200-kilowatt wind turbine replacing a thermal power plant would save 120 to 200 tons of coal. Burning that much coal would add two to three tons of Sulphur dioxide, 1.2 to 2.4 tons of nitrogen oxide and 300-500 tons of carbon dioxide to the atmosphere.

##### **Nuclear Energy**

In the face of acute power shortage, nuclear energy is being mooted as an alternative to augment power supply. It is a non-carbon emitting energy option, since it is not generated through burning fossil fuel like coal. India has indigenous nuclear power program and expects to have 20,000 MW nuclear capacities on line by 2020. India is outside the Nuclear non-Proliferation Treaty due to its weapons program, and is largely excluded from trading in nuclear plant or materials. This has hampered the development of civil nuclear energy. The nuclear weapons capability of India has arisen independently of its civil nuclear fuel cycle and uses indigenous uranium. Because of its isolation in international trade and lack of indigenous uranium, India has uniquely been developing a nuclear fuel cycle exploiting its reserves of thorium.

Nuclear power generated 15.6 billion kWh (2.6%) of India's electricity in 2006 from 3.5 GW capacity and this will increase steadily as new plants come on line. India's depleting fossil fuels is driving the country to make investments to generate electricity from nuclear energy, and 25% nuclear contribution is foreseen by 2050, from one hundred times the 2002 capacity.

Once the agreement on Nuclear Energy with the US goes through, nuclear energy generation capacity will increase, with the transfer of advance nuclear reactor and fuel, helping to mitigate power shortage problem. Nuclear power plant capacity targets as estimated by the Department of Atomic Energy (DAE) are 10,280 MWe by the end of 11th Five-Year Plan.

## Clean Coal Technologies

Clean coal technologies offer the potential for significant reduction in the environmental emissions when used for power generation. These technologies may be utilized in new as well as existing plants and are therefore, an effective way of reducing emissions in the coal fired generating units. Several of these systems are not only very effective in reducing SO<sub>2</sub> and NO emissions but because of their higher efficiencies they also emit some lower amounts of CO<sub>2</sub> per unit of power produced. CCTs can be used to reduce dependence on foreign oil and to make use of a wide variety of coal available.

Blending various grades of raw coal along with beneficiation shall ensure consistency in quality of coal to the utility boilers. This approach assumes greater relevance in case of multiple grades of coals available in different parts of the country and also coals of different qualities being imported by IPPs. Ministry of Environment and Forests, vide their notification dated 30th June 1998, had stipulated the use of raw or blended or beneficiated coal with an ash content not more than 34% on an annual average basis w. e. f.

1st June 2001.

## Wind Energy in India

The story of India's wind power started in 1980s, when the Commission for Additional Sources of Energy had been set up in 1981 and upgraded to the Department of Non-Conventional Energy Sources in 1982. The institution was mainly set up to encourage diversification in fuel sources other than coal, oil and is required to meet the demand of the country's rapid economic growth. The broad based national program included wind resource assessment; research and development support; implementation of demonstration projects to create awareness and opening up of new sites; involvement of utilities and industry; development of infrastructure capability and capacity for manufacture, installation, operation and maintenance of wind power plants; and policy support.

However, the growth in wind power generation has started to rise only after the government has set up Ministry of Non-Conventional Energy Sources in 1991. The ministry was mainly responsible for providing support for research and development, survey and assessment of wind resources, demonstration of wind energy technologies and fiscal and promotional measures for implementation of private sector projects. The growing concern regarding global warming and depleting non-renewable resources has drawn the attention of Indian government towards green energy and renewable sources. Within the renewable energy space, wind power, which offers by far the best combination of economics and scalability (Refer Table 1), has attracted huge government interest in it. The government has come with several incentives like 80% accelerated depreciation, tax holiday for power generation projects, concessional customs and excise duty as well as liberalized foreign investment procedures. These policies accelerated the growth of wind power from 39 MW in 1991 to 8000 MW by the end of 2007, which can be clear from figure 3. India now ranks fourth in the world in wind power generation.

**Table 1: Capital Cost and Generation Cost of Power from Different Renewable Sources**

Source	Capital Cost (Million per mw)	Generation Cost (Million per mw)
Wind Power	35	20.25
Small Hydro	35 -60	150-35.0
Co-Generation	20-25	20.00-25.00
Solar Photovoltaic	300	150.00-200.00
Sea Wave	90	58
Biomass Gasifier	24	11

*Source: Indian wind power.*

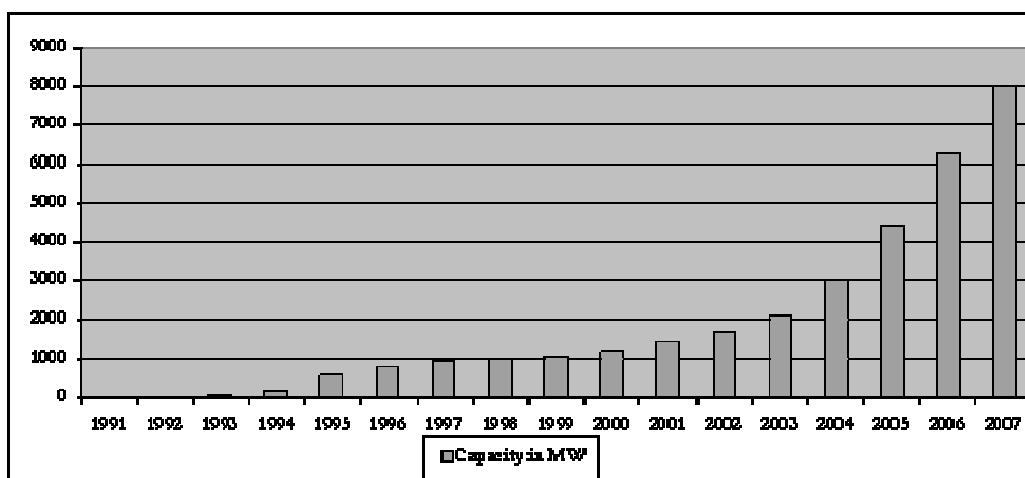
## Performance

Indian power industry has come a long way since Indian independence; the installation capacity has registered a 83-fold increase, from 1713MW in 1950 to 143061.01 MW as on 31st March 2008. During the fiscal 2008, the capacity addition was 10731 MW with a growth rate of 8.1%. Historically, power industry in India is characterized by electricity shortages. For the year 2007-08, the power shortage was at 73338 million units, amounting to 9.90 percent of total power requirement, with the peak power shortage at 18073 MW. For the last three years, the amount of power shortage has been increasing both in actual and percentage figures. The main reason for this was while Indian economy is growing at over 9 percent per annum the power generation is growing at just over 7 percent. Even though there is a slight southward movement in the percent of losses, they are very much above the accepted levels. Refer Annexure VII for the T&D loss figures in percentage. The Planning Commission has estimated that improvements in the distribution sector are necessary for drastically reducing the AT&C losses. It has estimated investments of up to Rs.10,00,000 million in the distribution sector to reduce the losses. Also, the government should undertake reforms in transmission and distribution sectors.

For the fiscal 08, the overall PLF stood at 78.61% as against the targeted 77.14%, with private sector operating at 90.79% PLF followed by central sector with a PLF of 86.74%. However, the performance of state sector is disappointing with a PLF of 71.89%. During the Tenth Five-Year Plan, out of the targeted capacity addition of 41000 MW only 23000MW was added. Experts opine that the capacity hurdles India is presently confronted with is the reason for the low capacity addition. These hurdles are in the form of lack of adequate domestic manufacturing capacity for generation equipment, which is a major bottleneck coming in the way of timely completion of generation projects. It can be overcome by creating more players in this field and by bringing cost competitiveness and accountability to timelines.

Due to the incentives taken by Ministry of New and Renewable Energy (MNRE), wind energy market in India has been growing steadily over the last 3-4 years. The cumulative installed MW capacity for wind power in India at the end of 2003 was at 2125 MW; over the last three years, the installation of wind turbines in India has been growing at over 40 percent per annum. The cumulative installed MW capacity for wind power in India is expected to grow from 6,228 MW in CY 2006 to 18,028 MW in CY 2011, representing a CAGR of 24%.

**Figure 3: Total Generation Capacity of Wind Power in India from 1991 to 2007**



*Source: wind power statistics.*

### Future Outlook

While reconfirming the importance of environmentally friendly source of power such as wind energy there are three serious problems. They are limitation of fossil fuels, climate change due to rapidly increasing carbon dioxide emission and insecurity by nuclear weapon competence and radioactive materials. The alternative for this problem is transition to unlimited resources, zero-emission fuels and no options for abuse. So recourse to renewable resources like wind and sunlight will be a natural option to solve this problem and are expected to play a major role in future in the electrification methods followed across the world.

As mentioned earlier the Indian economy is expected to grow at 8 to 9 percent for the next 15 years. To support this growth, India's energy needs are also expected to increase at the same rate. To meet the ongoing demand in power, the Government of India has targeted a capacity addition of 78577 MW during the 11th Five-Year Plan, which covers fiscal 2008 through 2012. Out of the targeted 78577 MW during 11th Five-Year Plan the Centre is expected to add 39865 MW, while state and private sector are expected to add 27957 and 10760 MW each. Out of the targeted 78577 MW of power generation during 11th Five-Year Plan, capacity addition from thermal plants will be around 75 percent of total additions targeted at 58644 MW, from hydro 16553 MW and the remaining 3380 MW from nuclear power plants. Out of the targeted capacity addition of 78577 MW, 48955 MW is under construction and the orders for the remaining are yet to be placed. Keeping in view the necessary changes in the policy structure to encourage power production, the government has de-licensed generation under the Electricity Act, 2003. The requirement of techno economic clearance of Central Electric Authority (CEA) for thermal power plants has been removed. The objective is to give flexibility to promoters in setting up generation plant.

To match these targets and decrease India's dependence on fossil fuels the government has been encouraging power producers towards renewable sources. In this direction, it has announced some incentives to the producers of wind energy like, a concessional import duty for wind electricity generator sub-systems, excise duty exemption, ten years tax holiday on wind power projects, benefit of accelerated depreciation, term loan from Indian Renewable Energy Development Agency (IREDA), and identification of more potential locations by carrying out wind resource assessment studies.

According to surveys made earlier, India has the potential to generate 45000 MW of power through wind, but only 8000 MW is harnessed till now. Hence, there is enormous scope for wind producers in future. Till now, India has not conducted any studies about its offshore wind energy potential. Once studies are conducted it is expected to increase the generation potential of the country.

As mentioned earlier, the growing concern of global warming has led many countries towards renewable energy, which is environmental friendly. Many countries like India, United Kingdom, United States and Germany have provided fiscal incentives and schemes to encourage the growth of renewable energy sources. These incentives and schemes range from preferential tariffs or tax credits for renewable energy projects, and framing taxing schemes for those who contribute to emission of carbon dioxide. Approximately 141 countries have shown their support by adopting Kyoto Protocol, which became effective in February 2005. The participating countries have agreed to a long-term reduction of their carbon dioxide emissions by an average of 5.2% per annum compared to the level of emissions for CY 1990 and reach those levels by CY 2012.

However, the future of industry mainly depends on the regulatory policies of the government as they are considered to be the single largest driver of growth in renewable energy. Globally, the objective of energy security and government policies such as feed-in tariffs, tax incentives and favorable financing has driven alternative energy investments. If support measures for renewable energy were to diminish (e.g., non-extension of PTC beyond 2008 in the US, reduction in depreciation available for wind turbines in the first year in India), demand is likely to suffer and sales expectations would need to be lowered.

#### **Suzlon Power Ltd.**

As mentioned earlier, Suzlon is India's leading wind power equipment manufacturer and is the fifth largest player in the world with a market share of 10.5 percent and is dominating Indian market with a market share of above 50 percent. It is the fastest growing wind power equipment manufacturer in the world, which has been growing at over 100 percent for the last four years. In a span of 12 years, the company has expanded its operations into 14 countries across four continents thereby increasing its revenues from INR120 million in FY 1996 to INR79860 in FY2007. The company is expanding its business at a time when world is looking at wind power as an alternative in the face of depleting carbon reserves and to tackle global warming in an effective way.

#### **Products and Services**

The company offers turbines from customized versions suitable for installation in different climatic conditions, the capacity of these turbines ranges from 350 KW to 2.1 MW. Apart from turbines the company, manufactures wind power equipments like Towers, Gears etc. It also constructs wind farms. It has pioneered the concept of utility-scale wind farming, which led to the creation of some of the Asia's largest wind farms. Suzlon employs a comprehensive approach to the development of wind farms with all the necessary infrastructure, including land, civil work, electrical work, wind turbines, transmission lines, approach roads, etc., coupled with financial assistance for the investors. Its main business model includes selling wind power equipment, installation and maintenance of wind turbines and setting up wind farms.

#### **Segmental Analysis**

The two segments in which Suzlon operates are mainly Turbines and others, which include Towers and Rotor blades. Turbines contribute 76 percent to Suzlon's sales and have seen a growth of 8 percent mainly led by exports. For the year 2006-07, Suzlon experienced a negative growth of 7 percent in terms of quantity in domestic sales; however, due to increase in the price of turbines per MW the sales remained flat for the FY 06-07. The share of exports has increased from 7 percent in FY2005-06 to 23 percent in FY2006-07. There was a six-fold increase in the exports for the FY 2006-07, leading to an increase in total turbine sales by 8 percent.

Others, which include Tubular towers and Rotor blades, saw a staggering growth of nearly 400 percent. During the FY 2006-07, domestic sales have increased by 26 percent while the exports increased by a staggering 800 percent leading to overall increase in sales by 400 percent. This increase in sales in other components has helped the company to register an overall increase in sales by 42 percent.

#### **Company's Strategies**

The increasing competition among the global players to tap the fast growing wind power market has made Suzlon to acquire REpower to effectively compete in the global market. Company sources pointed out that in view of this intense competition it has identified the following strategies.

- **Strategic Acquisitions and Alliances:** Suzlon believes that acquisition of potential players, can be the key factor for its growth. It continuously evaluates potential players who can bring either technology or new line of production for acquisition. Suzlon intends only to pursue those transactions that complement its key strengths, are synergistic and, in its assessment, have manageable integration risks. In line with this strategy, Suzlon has acquired Hansen Transmissions of Belgium, and has made a bid to acquire REpower Systems AG of Germany.
- **Expanding Capacities:** Suzlon is in the process of constructing additional manufacturing facilities in India for

WTGs and key components. Suzlon has adopted a strategy to support high growth markets with dedicated manufacturing capacity – as in the case of the USA and China. Suzlon also intends to expand its manufacturing capacity for gearboxes in Belgium to meet growing demand in a supply-restricted environment. With the increasing scale of operations, new initiatives are underway to get the best out of the manufacturing and the logistics processes. In order to unlock the value of its three key components of the wind turbine, Suzlon is moving to segregate its manufacturing into three verticals – Nacelle, Composites and Tower – to make them more accountable, profitable and scalable. Suzlon is also introducing lean manufacturing processes to build world class supply chain and manufacturing capabilities and generate synergies through effective co-ordination across businesses.

- **Organic Growth through Expansion in High Growth Markets Worldwide:** In order to increase its share of the world market for wind energy, Suzlon plans to continue to grow its overseas operations. The key markets for its future growth are China, India, US, UK, Canada, Germany, Spain, Italy, France and Portugal as these markets have huge potential for further development and investment in renewable energy, and wind power in particular.
- **Constructing Wind Farms:** Suzlon, which has pioneered the concept of utility-scale wind farming in India is on the way to build the world's largest wind farm in the Maharashtra state of India which will have over 1,000 MW of installed wind turbine capacity when complete. This model leverages the resources of all the stakeholders in wind power project and maximizes the return on investment. Suzlon brings together smaller orders from Suzlon customers, enabling the company to create large collective wind farms. These wind farms enable the reduction of costs through economies of scale, such as allowing operations and maintenance services to be centralized leading to reduced manpower requirements and other maintenance charges.
- **Vertical Integration:** Over the last few years, Suzlon has entered into other segments like gearbox manufacturing and other components. This will reduce the company's dependence on the manufacturers of other components. This will be an added advantage to Suzlon at a time when industry is faced with supply constraints.
- **Research and Development:** Suzlon firmly believes research as a key factor to stay ahead of other players in the industry and believes that efficient use of wind energy is imperative to meet the future target for conventional energy. Suzlon aims to take advantage of its vertically integrated organization to combine WTGs research with component level development to design and develop advanced WTGs offering greater cost efficiency and reliability. To give shape to this vision, Suzlon plans to set up technology centers, innovation centers and engineering centers at various locations across the world.

#### Future Outlook

As mentioned earlier according to the report published by U.S. Department of Energy, Massachusetts Technology Collaborative and General Electric, US is having a wind power potential of 900000 MW compared to the present capacity of 16818 MW of capacity indicating huge potential to grow. At the same time, UK is targeting to use offshore wind turbines to generate enough power to light every home in the U.K. by 2020. With the growing wind power industry the manufacturers have great prospects in future. Suzlon is leaving no stone unturned to grab the available opportunities in wind power. To improve the cost effectiveness of WTGs, Suzlon is making constant efforts to increase the capacity of WTGs, as these will improve the profitability of wind power generation through increasing the number of units of power generated per turbine; at the same time, it is planning to construct large wind farms that will bring the economies of scale to the company. To tap the fast growing Chinese market, the company has already started its production facility in China. This will help the company to cater to the needs of Chinese market, which is expected to have wind energy capacity of 30000 MW by the year 2020, from the present capacity of 6000 MW by the end of 2007.

The other big opportunity the company has is in the form of repowering old and out-dated turbines with new and highly efficient turbines. This segment is expected to become one of the growth drivers in relation to the future market for wind power, particularly for countries in Europe that have a large number of ageing WTGs installations with relatively low capacity and out-dated technology.

Till date, the company is engaged in onshore installations. It does not have any presence in offshore installations, which is gaining popularity in European countries due to availability of winds of high speed. The cumulative offshore installed capacity stood at 877 MW at the end of CY 2006. With the introduction of larger WTGs targeted at the offshore market, significant developments are expected in the offshore market in the future. New offshore installations are expected to increase significantly over the coming years with cumulative offshore installations expected to reach 7,607MW by CY 2011. This will provide huge opportunity to Suzlon, which is specializing in large WTGs.

In line with the expansion plans, Suzlon is also to concentrate on the quality issues, because any product fault would impact the reputation of the company. Teething troubles with new turbines and/or in new geographies are a risk for any wind turbine manufacturer as besides penalties/warranty and guarantee charges, a significant increase in faults could damage the company's reputation for reliability, in turn affecting future sales prospects.

#### ANNEXURE I

**Projected Financial Data for the Next Three Years i.e. from FY 08 to FY 10**

- The company is expected to install 794.25 MW, 900 MW and 1136.25 MW of capacity domestically and expected to export 416.58 MW, 624 MW and 748.8 MW of capacity.
- The average price realization per MW will be at Rs.43.17 mn, Rs.45.32 mn and Rs.47.59 mn per MW.
- Others (which include gears, towers and others) are expected to contribute 23.653 percent of total sales in future.
- Stock adjustment would be at Rs.1,691.10 mn, Rs.2,234.48 mn and Rs.2,902.29 mn.
- Cost of raw material would be at Rs.42,620.84 mn, Rs.59,130.08 mn and Rs.80,638.96 mn.
- Power and fuel costs as a percent of net sales will increase from 0.06 percent in FY 07 to 0.08 percent in FY 08, 0.09 percent in FY 09 and 0.10 percent in FY 10.
- Staff costs will remain at 2.17 percent of net sales for the next three years.
- Other manufacturing costs will remain at 5.29 of net sales for the next three years.
- Selling and administration costs will be at Rs.6,846.57 mn, Rs.9,046.48 mn and Rs.11,750.15 mn.
- Miscellaneous expenses are expected at Rs.308.10 mn, Rs.407.09 mn and Rs.528.76 mn.
- Provision for replacement for the FY 08 will be Rs.1,000 million.
- Depreciation is expected to be maintained at 15.971 percent of assets for depreciation.
- Gross assets will be at Rs.7,607.3 mn, Rs.10,051.65 mn and Rs.13,055.73 mn.
- Interest rate for the future is expected at 9.15 percent.
- Other income would be at Rs.931.74 mn, Rs.1,118.09 mn and Rs.1,341.71 mn.
- Effective tax rate is expected at 6.14 percent.
- Other non-cash charges are expected at Rs.252.97 mn, Rs.309.03 mn and Rs.379.8 mn.
- Current asset turnover ratio is expected to be at 1.1071, 1.2060 and 1.2961 and the current ratio will be at 2.99, 2.66 and 2.40.
- Capital work in progress would be at Rs.1,144.26 mn, Rs.1,406.29 mn and Rs.1,827.28 mn.
- Total shareholders equity will be at Rs.47,582.28 mn, Rs.60,430.11 mn and Rs.73,999.11 mn.
- Debt-Equity ratio will be at 0.3575, .0.3637 and 0.3676 and is expected to maintain at 0.3676 in future.
- Growth rate for the period FY 2011 to FY 2020 will be at 17 percent, after that the terminal growth rate is expected to stabilize at five percent per annum.
- For risk-free rate we have taken yield on 10-year government bond which is at 7.55 percent.
- Risk premium is taken at 8.5 percent
- No of shares outstanding is at 287.7 million.

*Source: Icfai Research Team.*

**ANNEXURE II**

**Profit and Loss Account of Suzlon for the Period FY 04 to FY 07**

(Rs. in Million)

<b>Particulars</b>	<b>FY 04</b>	<b>FY 05</b>	<b>FY 06</b>	<b>FY 07</b>
Sales Turnover	7911.50	19175.00	37884.60	53803.70
Stock Adjustment	241.10	479.40	1106.00	686.00
Total Income	8152.60	19654.40	38990.60	54489.70
% Growth		141.08%	98.38%	39.75%
Expenditures				
Raw Material	5306.90	11959.30	24062.60	33337.40
% of Net Sales	67.08%	62.37%	63.52%	61.96%
Power and Fuel	5.60	11.20	17.70	34.70
% of Net Sales	0.07%	0.06%	0.05%	0.06%
Staff Costs	176.60	353.20	629.60	1114.60
% of Net Sales	2.23%	1.84%	1.66%	2.07%
Other Manufacturing Costs	70.90	193.60	2621.90	2848.30
% of Net Sales	0.90%	1.01%	6.92%	5.29%

Selling and Administration	1054.20	2234.20	2251.80	4456.60
% of Net Sales	13.32%	11.65%	5.94%	8.28%
Miscellaneous Expenses	76.50	261.00	28.80	242.70
% of Net Sales	0.97%	1.36%	0.08%	0.45%
Provision for Replacement	0.00	0.00	0.00	0.00
% of Net Sales	0.00%	0.00%	0.00%	0.00%
Total Expenditures	6690.70	15012.50	29612.40	42034.30
% of Net Sales	84.57%	78.29%	78.16%	78.13%
EBITDA	1461.90	4641.90	9378.20	12455.40
EBITDA Margin %	18.48%	24.21%	24.75%	23.15%
Growth %		217.53%	102.03%	32.81%
Depreciation & Amortization	96.50	389.70	458.70	734.90
EBIT	1365.40	4252.20	8919.50	11720.50
Financial Charges	257.80	436.50	569.30	1040.30
Other Income	379.40	105.80	676.40	515.60
PBT	1487.00	3921.50	9026.60	11195.80
Pre-tax Margin %	18.80%	20.45%	23.83%	20.81%
Extraordinary Items	7.80	2.40	-0.40	109.60
PBT after Extraordinary Items	1494.80	3923.90	9026.20	11305.40
Tax	36.00	309.20	814.30	694.00
Effective Tax Rate %	2.41%	7.88%	9.02%	6.14%
Adjusted PAT	1458.80	3614.70	8211.90	10611.40
Net Profit Margin %	18.44%	18.85%	21.68%	19.72%
Growth %		147.79%	127.18%	29.22%
Preference Share Dividend	0.90	15.00	15.10	15.00
Profits to Equity Holders	1457.90	3599.70	8196.80	10596.40
Shares in Issue	24.35	86.92	287.53	287.77
Adjusted EPS (Rs.)	59.88	41.41	28.51	36.82
Growth %		-30.84%	-31.16%	29.17%

Source: Suzlon Annual Report.

### ANNEXURE III

#### Balance Sheet of Suzlon for the Period FY 04 to FY 07

(Rs. in Million)

Particulars	FY 04	FY 05	FY 06	FY 07
Gross Assets	1590.85	2178.80	4004.10	5670.40
Accumulated Depreciation	237.71	576.10	1047.30	1785.70
Net Fixed Assets	1353.14	1602.70	2956.80	3884.70
Capital WIP	124.27	179.28	762.50	927.10
Investments	533.25	1260.08	2927.40	8052.60
Current Assets				
Cash	603.60	881.99	3162.40	3513.90
Inventories	2017.12	4945.87	11044.90	13752.50
Trade Debtors	3172.94	6763.35	15839.10	19707.80
Loans and Advances	2267.80	3759.82	6911.30	12971.90
Other Current Assets	0.62	0.00	0.00	0.00
Current Liabilities	3803.17	7148.03	12608.20	15019.80
Net Current Assets Excluding Cash	3655.31	8321.01	21187.10	31412.40
Deferred Tax (Net)	105.30	276.06	580.00	708.80
Capital Deployed	6374.87	12521.12	31576.20	48499.50
Total Assets	10178.04	19669.15	44184.40	63519.30
Non-Current Liabilities				
Secured Debt	1723.76	2854.57	2766.10	7717.80
Unsecured Debt	482.83	370.83	587.60	3648.60
Other Non-Current Liabilities	0.00	0.00	0.00	0.00
Total Liabilities	2206.59	3225.40	3353.70	11366.40

Share Capital	393.48	2019.23	3025.30	2877.80
Reserves	3774.80	7276.49	25197.20	34255.30
Total Stockholders Equity	4168.28	9295.72	28222.50	37133.10
Capital Employed	6374.87	12521.12	31576.20	48499.50

Source: Suzlon Annual Report.

#### ANNEXURE IV

##### Cash Flow Statement of Suzlon for the Period FY 04 to FY 07

(Rs. in Million)

Particulars	FY 04	FY 05	FY 06	FY 07
PBT	0.00	0.00	0.00	0.00
Depreciation	0.00	0.00	0.00	0.00
Other Non-Cash Charges		0.00	0.00	15019.80
Operating Profit Before WC Changes	0.00	0.00	0.00	15019.80
Changes in Current Assets	2271.01	8099.63	18237.31	12636.78
Changes in Current Liabilities	1052.46	0.20	0.52	0.41
Changes in WC	-1218.55	-8099.43	-18236.80	-12636.37
Cash Generated from Operations	-1218.55	-8099.43	-18236.80	2383.43
Direct Taxes Paid	0.00	0.00	0.00	0.00
Extra ordinary Income	0.00	0.00	0.00	0.00
Others	376.04	505.03	-1634.85	-379.00
Net Cash Generated from Operations	-842.51	-7594.40	-19871.65	2004.43
Cash Flow from Investing Activities				
CAPEX	893.88	11263.50	18709.60	15919.10
Investments	430.44	0.00	0.00	0.00
Interest Received	0.00	0.00	0.00	0.00
Others	880.39	1262.74	1404.66	
Net Cash Used in Investing Activities	-2204.71	-12526.24	-20114.26	-15919.10
Cash Flow from Financing Activities				
Change in Debt	1330.24	0.00	0.00	0.00
Change in Equity		-0.03	0.00	0.00
Dividends Paid	152.59	276.13	411.51	1656.50
Interest Paid	0.00	0.00	0.00	0.00
Others	201.85	240.92	10828.74	-635.20
Net Cash used in Financing Activities	1379.50	-35.24	10417.23	-2291.70
Net Increase in Cash and Cash Equivalents	-1667.72	-20155.88	-29568.68	-16206.36
Cash and Cash Equivalents at the Beginning	522.42	0.00	100.00	10.93
Net Increase in Cash and Cash Equivalents	-1667.72	-20155.88	-29568.68	-16206.36
Cash and Cash Equivalents at the End	-1145.30	-20155.88	-29468.68	-16195.43

Source: Suzlon Annual Report.

#### ANNEXURE V

##### Share Price of Suzlon, No. of Shares Issued and the Index of BSE-500 from October 2005 to February 2008

Month	Share Price (in Rs.)	No. of Shares	BSE-500
Oct-05	714.70	86.92	3,198.69
Nov-05	851.40	86.92	3,568.37
Dec-05	894.40	86.92	3,795.96
Jan-06	1,163.70	86.92	4,004.96
Feb-06	1,093.30	86.92	4,130.07
Mar-06	1,302.80	86.92	4,516.73
Apr-06	1,282.45	86.92	4,829.73
May-06	976.25	86.92	4,157.93
Jun-06	1,048.00	86.92	4,029.97

Jul-06	1,080.60	86.92	4,029.43
Aug-06	1,203.35	86.92	4,423.88
Sep-06	1,236.05	86.92	4,739.67
Oct-06	1,309.55	86.92	4,957.37
Nov-06	1,446.65	86.92	5,227.73
Dec-06	1,304.35	86.92	5,270.76
Jan-07	1,142.35	86.92	5,408.71
Feb-07	1,037.05	86.92	4,938.08
Mar-07	1,001.95	86.92	4,955.39
Apr-07	1,187.65	86.92	5,311.03
May-07	1,285.35	86.92	5,646.90
Jun-07	1,493.55	86.92	5,781.37
Jul-07	1,271.25	86.92	6,063.20
Aug-07	1,265.35	86.92	5,950.11
Sep-07	1,446.70	86.92	6,773.54
Oct-07	1,973.65	86.92	7,785.22
Nov-07	1,895.95	86.92	7,865.98
Dec-07	1,935.75	86.92	8,592.43
Jan-08	307.60	287.77	7,160.03
Feb-08	281.30	287.77	7,108.12

Source: BSE India.

#### ANNEXURE VI

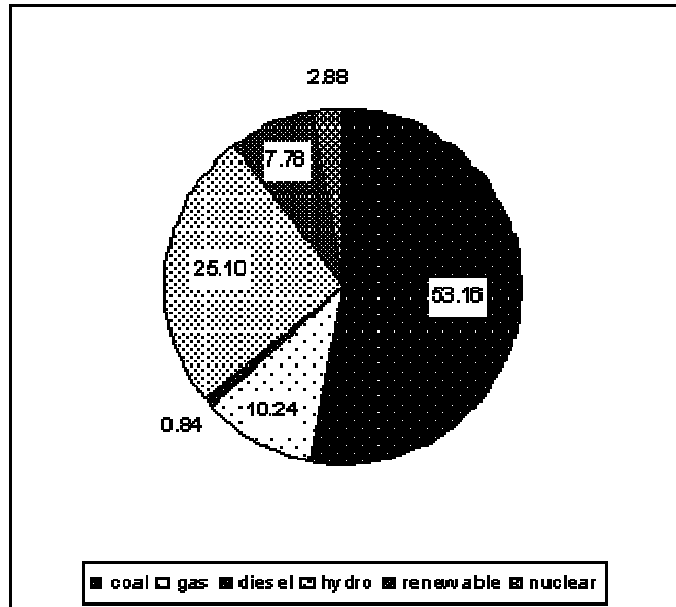
##### Percentage of T&D Losses and AT&C Losses since 2002-03

Year	T&D Losses in %	AT&C Losses in %
2002-03	32.54	32.54
2003-04	32.53	34.78
2004-05	31.25	34.33
2005-06	30.42	34.54
2006-07	28.61	32.07
2007-08	26.91	N.A

Source: CEA.

#### ANNEXURE VII

##### Fuel Wise Installed Capacity of Power Generation as on March 31,2008



*Source: CEA*

END OF SECTION B

END OF QUESTION PAPER

# Suggested Answers

## Professional Ethics and Case Studies (CFA660): January 2009

### Section A

1. The theory of corporate moral excellence focuses in two aspects – corporate culture and ethical behavior. Analysts believe that an organization culture has an impact on the behavior of its employees. Culture is based on the values of an organization. Corporate values can be classified as:

[≤](#)  
[TOP](#)  
[≥](#)

**Espoused values** – These refer to a company's statements, credos and code of ethics. They describe the organizations purpose and ethical perspective. Ethical perspectives are aimed at guiding the members who are responsible for leading and directing the organization. They are also intended to communicate to employees, customers, competitors and suppliers the type of behavior that is acceptable to the organization.

**Values in practice** – Espoused values may in many situations differ from values in practice. Take the case of an organization whose mission statement states that “The customer is the king” but in practice the organization pays little attention to customer service. Clearly, there is a difference between Espoused values and Values in practice. As a result of this difference between the values espoused and values practiced, level of trust (customer) will decline.

An organization can align its "Values in practice" to its "Espoused values" if it wishes to be regarded as an ethical organisation. This congruence in the espoused values and the values in practice will improve employee morale and their conformity to the organization's code of ethics.

Based on the concept of corporate culture, Michael Hoffman proposed the theory of corporate moral excellence for judging the ethical nature of an organization. He classified corporate culture into three types.

- Basic values, attitudes and beliefs of the organization

Organizational goals, policies, structure and strategies that are shaped by the values, attitudes and beliefs prevalent in the organization.

Organizational procedures and processes

Later Hoffman was of the opinion that employees were responsible for developing organizational goals. They also play a major role in evaluating the corporate culture and implementing a change process if required. He further states that a morally excellent corporation tries to strike a healthy balance between the corporate culture and the autonomy of its employees. He concludes by stating that espoused values and value in practice should be ethically accepted.

Clutterbuck proposed another approach for achieving corporate moral excellence that is aimed at providing insights into an organization. He proposed the following approach.

- The need for an ethics auditor: organizations themselves conduct a self-assessment exercise to gauge the ethical nature of their actions and operations.

The need to disclose exceptions of employee behavior, a common practice followed in countries like Europe and US.

The need to support the ethical behavior of the organization. Ethical behavior can be supported by creating an ethics committee and vesting a wide range of powers.

The need for reward systems to encourage ethical behavior.

If these approaches are incorporated in an organisation, the difference between Espoused values and Values in practice can be seen and enables to judge the unethical behavior and its responses.

2. **Principles Underlying An Ethical Approach To Strategic Management**

There are three principles for ethical approach to strategic management. They are:

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- Stakeholder Theory, Strategy and Ethics.

>

Loyalty and Psychological Contract.

Cultural Relativism.

### **Stakeholder Theory, Strategy and Ethics**

The stakeholder theory is rooted in the belief that business is an activity of society, and hence it has responsibilities to a much wider range of stakeholders than merely its shareholders, directors and creditors.

The stakeholder theory opposes a 'bolt-on' ethics mentality, which stems from the fact that the business community sees itself as doing its best to survive in a hostile environment. With this kind of an attitude, business strategy becomes merely a matter of reaching to internal and external threats. In such a situation, ethically correct decisions are acceptable only when they make good sense.

An alternative way of looking at ethics is to view business as having a pro-active role in creating an ethical society. The argument is that business is such a pervasive and powerful force in contemporary life, that it can no longer confine itself to a narrow universe of accounting goals.

### **Loyalty and Psychological Contract**

The relationship between employer and employee is based on a 'psychological contract'. The employees' loyalty to the organization is a key element of this contract. Employees have certain expectations about how they will be treated, and in turn, are willing to make certain sacrifices for the organization. Every strategic change calls for some sacrifice by the employees. A successful strategic change requires the commitment of all the organization members. The ethical issue here is that efforts must be made to convince people that the change is legitimate. Employees will continue to remain loyal to the organization only if they are sure that their psychological contract with the firm is not undermined.

### **Cultural Relativism**

There are no worldwide standards for the conduct of business. Cultural norms and values vary within the country and also between countries. What is considered as unlawful in one country may be considered a normal business practice in some other country. For instance, in some countries lobbying is considered legitimate, while in a country like USA, it is regarded as an unethical business practice. Value systems too, vary from country to country. While 'individual' needs are of primary importance in North America, 'group' needs take precedence in Japan.

Differences in culture often pose problems for firms that operate in foreign countries. One way of dealing with this problem is to adopt cultural relativism. The term cultural relativism implies, adopting the norms of the country, in which an organization does its business. For instance, if bribes are considered a part of normal business practice then the fact must be accepted. But carrying too far raises serious ethical issues.

## **Section B**

### **3. Growth drivers**

The wind energy sector is expected to continue its positive development. The underlying drivers for wind energy remain intact, including the competitiveness of wind power, the growing demand for energy, the desire for less dependency on imports from politically unstable markets and the ever increasing focus on renewable energy.

**Increased Electricity Demand:** Growth in net electricity consumption is expected to be most rapid among the emerging economies of the world, including India. The projected growth in net electricity consumption for emerging market economies is driven in large part by Gross Domestic Product (GDP) and population growth. Because of the links between reliable electricity supply, GDP growth, and living standards, many of the nations with emerging economies are attempting to increase access to reliable electricity supply. Global Electricity Consumption expected to double between 2002 & 2030– higher growth in India and China and wind energy's contribution expected to increase from 0.2% in 2002 to 3% in 2030

**Cost Competitiveness:** Wind technology has become commercially viable. Cost per Kwh of wind generation decreased from US\$ 0.38 in early 80s to present US\$ 0.03-0.06, at excellent wind sites. Rising oil & gas prices makes wind energy cost competitive. In some circumstances, as when some transmission

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lines are down for maintenance or when the power supply exceeds demand, some wind providers will offer wind power at no cost or even pay to have their electricity moved on the grid, a response commonly referred to as “negative pricing.”

**Environmental Awareness/Government Initiatives:** Kyoto Protocol Implementation - Carbon-dioxide emission to reduce by 5.2% of 1990s levels, by 2012.

Wind power will significantly reduce CO<sub>2</sub> emissions, which is the key in the fight against dangerous climate change. Getting this right will be critical if governments are going to be able to meet their medium and longer term climate targets – wind energy is going to play a major role in the future; the only question is whether or not it plays that role soon enough to help us reach our climate goal of keeping global mean temperature rise below 2°C. The industry urge Governments to support wind power development via electricity market reforms and by cutting down subsidies for fossil and nuclear fuels.

**Energy Security:** Energy security is a matter of concern for most of the developed countries. Wind energy is the most attractive solution to the world’s energy challenges. It is clean and fuel-free. Moreover, wind is indigenous and enough wind blows across the globe to cope with the ever increasing electricity demand. Price volatility of Oil & Gas has increased focus on renewable energy. Oil price hike in recent times, political developments in mid-east and gas crisis in the winter 2006-07 have further heightened the energy security concerns, particularly in Europe.

**Increasing Focus:** Wind power has experienced major growth in OECD countries, especially the United States and Europe, with significant growth in developing countries such as China and India. The global market for wind power has been expanding faster than any other source of renewable energy. From just 4,800 MW in 1995 the world total has multiplied more than twelve-fold to reach over 59,000 MW at the end of 2005. The international market is expected to have an annual turnover in 2006 of more than € 13 billion, with an estimated 150,000 people employed around the world. The success of the industry has attracted investors from the mainstream finance and traditional energy sectors.

#### 4. Economic Advantages

- **Revitalizes Rural Economies:** Wind energy can diversify the economies of rural communities, adding to the tax base and providing new types of income. Wind turbines can add a new source of property taxes in rural areas that otherwise have a hard time attracting new industry. Each 100 MW of wind development in southwest Minnesota has generated about \$1 million per year in property tax revenue and about \$250,000 per year in direct lease payments to landowners.

**Fewer subsidies:** All energy systems are subsidized, and wind is no exception. However, wind receives considerably less than other forms of energy. Conventional energy receives US\$300 billion in subsidies per year, while renewable energy has received less than US\$20 billion of tax-payers money in the last 30 years.

**Free Fuel:** Unlike other forms of electrical generation where fuel is shipped to a processing plant, wind energy generates electricity at the source of fuel. Wind is a native fuel that does not need to be mined or transported, taking two expensive aspects out of long-term energy costs.

**Price Stability:** The price of electricity from fossil fuels and nuclear power can fluctuate greatly due to highly variable mining and transportation costs. Wind can help buffer these costs because the price of fuel is fixed and free.

**Promotes Cost-Effective Energy Production:** The cost of wind-generated electricity has fallen from nearly 40¢ per kWh in the early 1980s to 2.5-5¢ per kWh today depending on wind speed and project size.

**Creates Jobs:** Wind energy projects create new short and long term jobs. Related employment ranges from meteorologists and surveyors to structural engineers, assembly workers, lawyers, bankers, and technicians. Wind energy creates 30% more jobs than a coal plant and 66% more than a nuclear power plant per unit of energy generated.

#### Social Advantages

- **National Security/Energy Independence:** Wind turbines diversify our energy portfolio and reduce

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our dependence on foreign fossil fuel. Wind energy is homegrown electricity, and can help control spikes in fossil fuel cost. Distributed generation facilities, like many community wind projects, provide a safeguard against potential terrorist threats to power plants.

**Supports Agriculture:** It is not often a new crop emerges from thin air. Wind turbines can be installed amid cropland without interfering with people, livestock, or production.

**Local Ownership:** A significant contribution to the worldwide energy mix can be made by small clusters of turbines or even single turbines, operated by local landowners and small businesses. Developing local sources of electricity means we import less fuel from other states, regions, and nations. It also means our energy dollars are plowed back into the local economy.

### Environmental Advantages

**Clean Water:** Turbines produce no particulate emissions that contribute to mercury contamination in our lakes and streams. Wind energy also conserves water resources. For example, producing the same amount of electricity can take about 600 times more water with nuclear power than wind, and about 500 times more water with coal than wind.

- **Clean Air:** Other sources of electricity produce harmful particulate emissions which contribute to global climate change and acid rain. Wind energy is pollution free.

**Mining & Transportation:** Harvesting the wind preserves our resources because there no need for destructive resource mining or fuel transportation to a processing facility.

**Land Preservation:** Wind farms are spaced over a large geographic area, but their actual "footprint" covers only a small portion of the land resulting in a minimum impact on crop production or livestock grazing. Large buildings cannot be built near the turbine, thus wind farms preserve open space.

5.

Months	Price change		X <sup>2</sup>	Y <sup>2</sup>	XY
	X	Y			
January					
February	-70.40	-105.30	4956.16	11088.09	7413.12
March	209.50	-35.10	43890.25	1232.01	-7353.45
April	-20.35	185.70	414.12	34484.49	-3778.99
May	-306.20	97.70	93758.44	9545.29	-29915.74
June	71.75	208.20	5148.06	43347.24	14938.35
July	32.60	-222.30	1062.76	49417.29	-7246.98
August	122.75	-5.90	15067.56	34.81	-724.23
September	32.70	181.35	1069.29	32887.82	5930.15
October	73.50	526.95	5402.25	277676.30	38730.83
November	137.10	-77.70	18796.41	6037.29	-10652.67
December	-142.30	39.80	20249.29	1584.04	-5663.54
<b>Total</b>	<b>140.65</b>	<b>793.40</b>	<b>209814.59</b>	<b>467334.67</b>	<b>1676.85</b>
<b>Mean</b>	<b>12.79</b>	<b>72.13</b>			

$$\bar{X} = 12.79 \quad \bar{Y} = 72.13$$

$$\Sigma X^2 = 209814.59 \quad \Sigma X = 140.65$$

$$\Sigma Y^2 = 467334.67 \quad \Sigma Y = 793.40$$

$$\Sigma XY = 1676.84$$

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$$r^2 = \frac{a\Sigma Y + b\Sigma XY - n(\bar{Y})^2}{\Sigma Y^2 - n(\bar{Y})^2}$$

$$a = \bar{Y} - b\bar{X}$$

$$b = \frac{\Sigma XY - n\bar{X}\bar{Y}}{\Sigma X^2 - n(\bar{X})^2}$$

$$= \frac{1676.85 - 11(12.79)(72.13)}{209814.59 - 11(12.79)^2}$$

$$= -0.0407$$

$$a = \bar{Y} - b\bar{X}$$

$$a = 72.13 - (-0.0407)(12.79) = 72.65$$

$$r^2 = \frac{72.65 \times 793.40 + (-0.0407)(1676.85) - 11 \times (72.13)^2}{467334.67 - 11 \times (72.13)^2}$$

$$= \frac{342.16}{410104.56}$$

$$= 0.00083$$

Hence, there is a small degree of negative correlation between the returns of two periods and therefore we can conclude that changes in share prices are random.

6.

Measures of relative valuation	SNC Textiles	Indus Fila	Grabal Alok	Shri Lakshmi	Sarla Performance	Average
Price/Earnings Ratio (P/E ratio)	23.69	4.78	15.20	1.20	2.76	9.53
Price to Book Value (P/BV ratio)	27.07	0.95	0.92	0.26	0.56	5.95
Price/Sales Ratio (P/S ratio)	1.68	0.40	0.92	0.07	0.30	0.67

According to relative valuation method, value per share of SEL  
 $= (36.82 \times 9.53 \times 0.25) + (129.04 \times 5.95 \times 0.70) + (186.97 \times 0.67 \times 0.05)$   
 $= 87.72 + 537.45 + 6.26$   
 $= \text{Rs.} 631.43$

As per relative valuation the company was overvalued as on March 31, 2007.

**Notes:**

Sales per share (FY 2007) =  $53803.7/287.77 = \text{Rs.} 186.97$

EPS (FY 2007) = Rs.36.82 (Given)

Book value for SEL (FY 2007) = Net Worth/No. of out standing shares =  $37133.1/287.77 = \text{Rs.} 129.04$

7. **Opportunities:**

Wind power currently offers the greatest potential in terms of success, growth, and competition. Since the 1990s, the costs of building wind power stations and producing wind energy have fallen considerably. The cost of wind-generated electricity is already comparable to that of electricity from traditional sources. Wind energy promises to be of great interest as it is highly environment friendly and uses a renewable resource. Most of the critical components of a wind turbine uses composites and the need for bigger size turbines means more composite usage per turbine. Suzlon maintains its edge in the global wind energy sector and the company forte is supply of equipment to customers quickly and efficiently. It has a strong manufacturing base, supported by the projects and operations and management team to help Suzlon transport and deliver its products on time and on budget to all its esteemed customers

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One of the major competitive strengths that the company possesses is its focus on providing “integrated solutions” wind energy packages with its associate companies. Added to this, the sophisticated in-house technology and design capabilities, cost-efficient manufacture and effective supply chain in India, position as a market leader, expertise in operations and maintenance and strong management team provides enough reason for its dominance in the wind energy sector.

**Rising energy demand:** Wind power is quickly emerging as a serious alternative not just in affluent areas of the world but in fast-growing countries like India. Although wind energy is growing at the fastest fast among renewable energies still it is not self sufficient for future growth it largely depends upon the government policies. The global demand for wind power has accelerated rapidly during the last few years. The major reason for this is the rising energy demand as well as the environmental challenges. Wind energy is one of the most effective renewable energy resources that is suitable to meet the rising global energy demand as well as the environmental challenges. The global wind energy market is growing at a fast rate as compared to other renewable energy resources. The competitive advantage is due to the manufacturing technologies for wind equipments that these countries have over other countries.

**Supply chain management:** The greatest challenge the industry faces today is in its supply chain. The growth of the wind energy sector is limited not by demand, but supply of critical wind turbine components leading to delays in manufacture and project execution. At Suzlon, which has recognized the challenge early a implemented an aggressive backward integration strategy using in-house R&D, strategic alliances and acquisitions to bring the supply chain of critical wind turbine components such as rotor blades, generators and gearboxes under our control. Suzlon is demonstrating that wind energy can be successful beyond the traditional markets in Europe and North America. While companies from Denmark, Germany, Spain, and the United States still dominate the market, Suzlon has learned to navigate the unique challenges of wind power development in less-affluent nations like India and China.

8. While wind energy provides one of the potential solutions to generate renewable energy without creating harmful greenhouse gases, there is risk management issue associated with wind energy development. The development of wind energy projects requires a range of inputs including an understanding of the wind resource, security of land, access to suitable electricity transmission grid, a market for the electricity, access to suitable technology and a level of community support. SEL is exposed to market risk resulting from fluctuations and changes in foreign exchange rates and interest rates.

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**Interest Rate Risk:** The financial results of the company were subjected to changes in interest rate risks that may affect the company’s obligation to service its debts. The long-term rupee-denominated debts bear interest at floating rates linked with the prime lending rates. The company’s long-term foreign currency denominated debts that bear interest at floating rates linked with the six months US dollar. The company uses derivatives instruments in order to hedge against adverse movements in interest rates with the primary objective of reducing the cost of debt. The values of these specific contracts are always subjected to fluctuations in the interest rates and may also result in a negative carry from time to time. The upward fluctuations in the interest rates increase the cost of both the cost of existing as well as new debts.

**Exchange Rate Risk:** Though the company maintains its records and prepares the financial statements in Rupees, its export sales are priced in US Dollars. Similarly, the company imports a significant volume of raw materials and key components most of which are denominated in foreign currencies such as the Euro, the DDK and the US Dollar. Added to this, the changes in the exchange rates impact the cost of borrowings denominated in currencies other than Rupee. From time to time, the company uses derivative instruments in order to hedge the foreign exchange exposures. The weakening of the Rupee as against the Euro, the US Dollar and other major currencies may adversely affect the company’s cost of borrowing and imports and may eventually increase the cost of financing and raw materials, at the same time it may also result in foreign exchange gain on sales made to international customers. The foreign subsidiaries of SEL operate in foreign countries in their respective currencies. The company is subjected to translation

gains and losses on the assets and liabilities of such subsidiaries for the purpose of integrating the company's financial statements. Added to this, the company has experienced and may even experience in future, foreign exchange losses and gains on the obligations that are denominated in foreign currencies in respect to its borrowings, debtors and creditors.

**Commodity Price Risk:** SEL is exposed to market risk with respect to the prices of raw materials and components that are used in the manufacture of WTGs and WTG components. These commodities include steel and copper. The cost associated with these raw materials and the components are subjected to fluctuations arising out of commodity prices. The cost of components and the various small parts that are sourced from outside manufacturers are also subject to fluctuations based on the availability from the suppliers. In the normal course of business, the company purchases the raw material and the components either on the basis of purchase order or pursuant to its supply orders.

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