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A Study on Financial Performance in Wind Energy in Tamilnadu

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ABSTRACT

Energy is one of the major inputs for the economic development of any country. All important activities concerned with present development are depending on energy in one form or the other. While fossil fuels are the main fuels for thermal power, there is a fear that they will get exhausted eventually in this century. Therefore, we are in need of harnessing any other renewable resources. Renewable energy sectors are all about using natural sources to create energy. The power generation from wind energy is technically achievable and economically feasible and its main advantages are zero fuel cost, pollution free and environment friendly. In the continuous search of clean, safe and renewable energy sources, wind power has emerged as one of the most attractive solutions Energy is one of the major inputs for the economic development of any country. Every significant activities disturbed with present development are depending on energy in one form or the other. While relic fuels are the main fuels for thermal power, there is a fear that they will get exhausted eventually in this century. Therefore, we are in need of harnessing any other renewable resources. Renewable energy sectors are all about using natural sources to create energy. The power generation from wind energy is technically achievable and economically feasible and its main advantages are zero fuel cost, pollution free and environment friendly. In the continuous search of clean, safe and renewable energy sources, wind power has emerged as one of the most attractive solutions

1. INTRODUCTION

Wind Turbine System (WTS) converts kinetic energy available in wind to electrical energy by using rotor, gear box and generator. In other words, the actual conversion process uses the basic aerodynamic force of lift to produce a net positive torque on a rotating shaft, resulting first in the production of mechanical power and then in its transformation to electricity in a generator. Wind turbines, unlike most other generators, can produce energy only in response to the resource that is immediately available. The output of a Wind Turbine (WT) is thus inherently fluctuating and non dispatch able. Extraction of wind energy using wind turbines depends strictly on wind speed and direction. The rated capacity of the WT for power generation varies from 1 kW to 4 MW. In wind farms, the generator size starts from 200 kW. Energy is an important input in all sectors of the country's economy. Electricity is the most versatile form of energy. Due to economic plans implemented in India after independence and also due to advancement in technology, more and more industrialization is there. As a result, the demand for electricity is growing. The growing consumption of power has resulted in the country becoming increasingly dependent on fossil fuels. But, the Indian and world reserves of fossil fuels are fast depleting. The future generation is left with no option other than going in for renewable energy sources such as wind, solar, nuclear and hydro. Amongst these, wind power installation is latest mantra in global Endeavour to improve the power generation by minimum cost. Throughout the world, the need for and significance of wind energy is recognized. It is

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environmentally begin and does not emit green house gases. The potential of wind energy as a source of power is large. The energy available in the winds over the earth's surface is estimated to be 1.6 x 10 MW, which is of the same order of magnitude as the present energy consumption on the earth.

WIND TURBINE RESEARCH STATION

C-WET established experimental Wind Turbine Research Station at Kayathar, Thoothukudi District, Tamil Nadu away from Chennai around 600 kms in Senkottai pass area, spread over approximately 100 acres of land, with more than 22 years old 9 x 200 kW Wind Electric Generators (WEG), 1 x 600 kW WEG and 1 x 2000 kW WEG for conducting various R&D related activities in addition to Type Testing facilities and Small Wind Turbine performance testing facilities. WTRS Unit successfully renovated the 22 years old, 9 nos of 200 kW WEG`s by replacing old controllers, sensors etc. Strategic efforts were made to improve the machine efficiency with suitable new controllers by bringing down the reactive power consumption by adding specially designed suitable additional capacitor banks incorporated in all the first 9 generation WEGs (200 kW).

INDIAN WIND ENERGY SCENARIO

In 2012, despite a slowing global economy, India's electricity demand continued to rise. Electricity shortages are common, and over 40% of the population has no access to modern energy services. India's electricity demand is projected to more than triple between 2005 and 2030. In the recently released National Electricity Plan (2012) the Central Electricity Authority projected the need for 350-360 GW of total generation capacity by 2022. Despite major capacity additions over recent decades, power supply struggles to keep up with demand. India had another record year of new wind energy installations between January and December 2011, installing more than 3 GW of new capacity for the first time to reach a total of 16,084 MW. As of March 2012, renewable energy accounted for 12.2 percent of total installed capacity, up from 2 percent in 1995. Wind power accounts for about 70 percent of this installed capacity. By the end of August 2012, wind power installations in India had reached 17.9 GW1. Under the New Policies Scenario of the World Energy Outlook (2011), total power capacity in India would reach 779 GW in 2035. To reach 779 GW in 2035, capacity must grow at a CAGR of 5.9 percent, or over 20 GW per year from 2009 through 2035. The largest addition per year up to now was nearly 18 GW during fiscal year 2011-20123; this scale of expansion could pose a challenge for the government [IEA, 20124] without a significant role for renewable. During fiscal year 2011-2012 wind energy alone delivered over 3GW to India's new installed capacity, accounting for over 16.5 percent of total new installed capacity.

As of January 2012, the per capita total consumption of electricity is 778 kWh. The Indian wind energy sector has an installed capacity of 16084 MW (as on December 31, 2011). In terms of wind power installed capacity, India is ranked fifth in the world. The Indian Wind Energy Association has estimated that with the modern technology, the 'on-shore' potential for yielding wind energy for electricity generation is in the order of 65,000 MW. Recently, the Centre for Wind Energy Technology reassessed India's wind power potential as 102,778 MW at 80 meters height. The year 2011 was a landmark year for wind energy sector with a capacity addition of 3.019 GW. But it has grown 41.14 percent higher than the last year installed capacity (2.139 GW). The growth of wind energy sector is tremendous in the year 2010 and 2011.It now

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contributes over 70 percent of the total renewable energy installed capacity in India. The wind energy in India contributes over 6 % of the total installed capacity of power generation. The report of the team for wind power development appointed by the Ministry of New and Renewable Energy (MNRE) to develop the approach for the 12th plan period (April 2012 to March 2017) has fixed a reference target of 15,000 MW and an inspirational target of 25,000 MW for the next five year period.

Worldwide wind capacity reached 215,000 Megawatts (MW) by the end of June 2011. The first six months of 2011 added 18,405 MW of wind power capacity. This increase represents 15% more than in the first half of 2010, when only 16,000 MW were added. Global wind capacity grew by 9.3% within six months and by 22.9% on an annual basis. According to the report, five countries-China, the United States, Germany, Spain and India-continue to do the market and the demand for wind power. Together, those countries comprise 74% of the global world capacity. China continues to dominate the world market for wind power. In the first half of 2011, it added 8 GW of capacity while the United States added 2.3 GW. The position of India globally which provides the details of capacity addition in 2011.

Wind energy currently meets 5.3% of the EU's electricity consumption from an installed capacity of 84.3 GW. The European Wind Energy Association's scenarios show that wind energy in 2020 should meet 15.7% of EU electricity demand from 230 GW and by 2030, 28.5% from 400 GW. Indeed, EWEA believes wind energy can provide half of Europe's power by 2050, with the remainder from other renewable sources. To ensure the continued buoyancy of the wind energy sector and the path to 100% renewable in 2050, EU renewable legislation is needed now for the period after 2020. This should follow the successful legislation so far by setting an ambitious, binding renewable target for 2030. In the second half of 2011, an additional capacity of 25500 MW is expected to be erected worldwide, which would bring new annual installations to 43'900 MW, compared with 37'642 MW in the year 2010. The total installed wind capacity is projected to reach 240'500 MW by the end of this year. This capacity can cover almost 3% of the electricity demand all over the world.

WIND ELECTRIC GENERATION: A SCENARIO

Globally installed capacities of WTGs have crossed 240 GW. Indian Energy Industries have a total installed capacity of 205 GW of Electricity generation as on date, of which about 25 GW if from all Renewable Energy sources in which about 17.6 GW is from Wind Energy. Wind is one of the fastest and most viable Renewable energy technologies. In India, the annual capacity addition per year, in 2011-12 is currently about 3200 MW. India also has about 2 MW of small wind-solar hybrid domestic systems which are mostly used as standalone applications. India with 17.6 GW ranks 5th in Wind power generation as on date, with China having the highest installed capacity of over 63 GW, with USA, Germany, Span, following with over 47 GW, 29 GW and 21 GW respectively. (1 Giga watt = 109 watt) In the Indian wind power development, the primary driving factor has been feed in tariffs (FIT) and accelerated depreciation and other tax incentives for domestic wind systems. Hence most of the investors in Wind Energy, apart from the demonstration projects of State and Central Governments are all from the Private Sector. Today there are more than 3500 wind farm owners having capacities of WTG (Wind Turbine Generator) from 225 kW to 2500 kW and most of the owners have bought either from Vendors (system integrators) or manufacturers having joint ventures or licensing agreement with Foreign collaborators mostly of European origin.

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WIND POWER INSTALLATIONS BY STATE

Historically, the States of Tamil Nadu, Karnataka, Maharashtra and Gujarat have been the leaders in terms of total wind installations. The States of Rajasthan, Madhya Pradesh and Kerala are quickly catching up. By the end of the 11th Plan period in March of 2012, the total installed capacity had reached a total of 17,351.6 MW. Interestingly more than 95 percent of the nation's wind energy development to date is concentrated in just five states in southern and western India Tamil Nadu, Andhra Pradesh, Karnataka, Maharashtra, and Gujarat [LBNL, 2012]. These five states accounted for over 85% of the total installed capacity at the end of the last plan period. Rajasthan is another emerging State with rising wind turbine installations.

2. NEED FOR THE STUDY

Wind energy is highly correlated with the overall performance of a country and the state of power supply. So, a study on wind energy industry is quite inevitable. Studies on financial performance acquire great significance in the context of growth in the developing economies. These economies are characterized by acute scarcity of resources, particularly capital and must use the available resources as best as they can. Also, generation of surplus resources which plays a pivotal role in their growth depends crucially on the efficiency with which resources are used. When capital is invested appropriately, it leads to better financial performance. Therefore, the study of financial performance is considered an important job of an industry. Evidently, the present study on financial performance of the selected wind energy would be of much interest, as it will bring out how effectively the financial resources are employed. It also helps to identify those variables that are responsible for better financial performance of the wind industry.

3. STATEMENT OF THE PROBLEM

India's significant and continuous economic growth is placing enormous demand on its energy resources. An increased wealth, urbanization, economic growth, rise in per capita consumption and extend of energy access caused huge demand for electricity in India. This usage needs to be curtailed, as it is leading to enormous costs in the form of government subsidies and increasing the country's import dependence and foreign revenue. In view of the above fact that there is a need to do research in the wind energy field to avoid the frequent failure of the wind turbine generator in the present scenario so as to get continuous power supply from the turbines. The problem for this research study is formulated to analyze the origin cause for the frequent failure of the major and costly components such as analyses the influence of changes in the various physical and operational performances of the Wind Turbines in Tamilnadu and their impact on the financial performance.

4. OBJECTIVES OF THE STUDY

The important objectives of the study are:

- To study the origin and growth of wind turbines in Tamilnadu
- To know the installed capacity of wind turbines and production of electricity through wind turbines in Tamilnadu.
- To study the nature and sources of finance of Wind Turbines in Tamilnadu and their implications on financial performance

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5. SCOPE OF THE STUDY

The scope of the study was limited to analyze the performance of wind turbines in Tamil Nadu give suggestions to improve the performance of wind turbines, to find out the financial problems faced by the installation and production of wind energy in Tamilnadu and to find out the operational performances of the Wind Turbines in Tamilnadu and their impact on the financial performance. This study does not cover other aspects related to the wind turbines.

METHODOLOGY OF THE STUDY

This research work is based on both primary as well as secondary sources of data. Secondary data has been a major source of data collection. Convenient sampling is used to collect information from the owners and stratified sampling was used to collect information from the employees were selected as the sample

TESTING OF HYPOTHESES

The study is based on the formulation of the following null hypotheses. The validity of them has been tested with the available data through appropriate analysis.

Ho: There is no significant difference in the liquidity ratios between the select wind energy in Tamil Nadu.
Ho2: There is no significant difference in the long term solvency ratios between the select wind energy in Tamil Nadu.
Ho3: There is no significant difference in the activity ratios between the select wind energy in Tamil Nadu.
Ho4: There is no significant difference in the profitability ratios between the select wind energy in Tamil Nadu.

6. FINDINGS OF THE STUDY

The calculated t value of the current ratios and Quick ratio of the wind energy (2.414) is less than the table value (2.878) at 5 per cent level of significance. This indicates that there is no significant difference in the current ratio between quick ratios. Therefore, the null hypothesis is accepted. The mean of the current ratio of the quick ratio over the study period is 2. 6620 and 2.6480, respectively. It reveals the poor liquidity position of the wind energy and they are not able to pay their current liabilities in time without facing difficulties.
From the above analysis, it is inferred that the calculated t value of the solvency ratio between the wind energy financial systems is 3.096, which is greater than the table value of 2.878 at 1% level of significance. This reveals that there is a significant difference in the proprietary ratio and solvency ratio. Therefore, the null hypothesis is rejected. The mean of the proprietary and solvency ratio are 3.60 and 2.20 respectively. Since the mean value shows low value, the solvency ratio wind energy financial system is satisfactory.

The calculated t value of the solvency ratio and capital-gearing ratio between the wind energy financial systems (5.149) is greater than the table value (2.878) at 1% level of significance. This test is significant. This means that there is a significant difference in the solvency ratio and

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capital-gearing ratio between wind energy. Therefore, the null hypothesis is rejected. The mean of the solvency ratio and capital-gearing ratio are 0.7280 and 3.3440 respectively.
The effectiveness of wind energy finance system based on satisfaction of the ratios. The F value is .282 and it is significant at the level of significance 0.610 at the degrees of freedom 1. In F test if the significant value is above 0.05 then Accept null hypothesis and accepted the alternate hypothesis. And this study shows there is no significant mean variation between creditor turnover ratio and Working Capital Turnover Ratios.

The calculated t value of the working capital turnover ratio and cash turnover ratio between the wind energy (3.279) is greater than the table value (2.878) at 1% level of significance. This reveals that there is a significant difference in the working capital turnover and cash turnover ratio. Hence, the null hypothesis is rejected. The average working capital market and cash turnover ratio of the wind energy is not satisfactory and it shows their inefficiency in the management of cash.
The effectiveness of wind energy finance system based on satisfaction of the ratios. The F value is .282 and it is significant at the level of significance 0.610 at the degree of freedom 1. In F test if the significant value is above 0.05 then Accept null hypothesis and accepted the alternate hypothesis. And this study shows there is no significant mean variation between working capital turnover ratio and Cash Turnover Ratios.

The effectiveness of wind energy finance system based on satisfaction of the ratios. The F value is .640 and it is significant at the level of significance 0.447 at the degree of freedom 1. In F test if the significant value is above 0.05 then Accept null hypothesis and accepted the alternate hypothesis. And this study shows there is no significant mean variation between average collection period and Average Payment period

The calculated t value of the gross profit ratio and net profit ratio between the wind energy is 1.050, which is less than the table value of 2.878 at 1% level of significance. This test is not significant. This means that there is no significant difference in the net profit ratio between gross profit ratio and net profit ratio. Hence, the null hypothesis is accepted. The mean of the net profit ratios of the gross profit ratio and net profit ratio are 27.20 and 30. 66; respectively, It is inferred that the net profit ratio of the gross profit ratio is satisfactory when compare with net profit ratio.
The calculated t value of the net profit ratio and operating profit ratio between the wind energy (4.912) is greater than the table value (2.878) at 1% level of significance. The test is significant. This means that there is a significant difference in the net profit ratio and operating profit ratio of the wind energy. Hence, the null hypothesis is rejected. The mean of the net profit ratio reveals that it is satisfactory (30.66) and operating profit ratio 65.38.

The calculated t value of the return on capital employed ratio and operating profit ratio between the wind energy (6.880) is more than the table value (2.878) at 1% level of significance. This reveals that there is no significant difference in the operating ratio and return on capital employed ratio between wind energy. Hence, the null hypothesis is rejected. The mean of the return on capital employed ratio (65.38) and operating profit ratio (13.45).
It is inferred from the above table that the gross profit ratio of the wind energy has low degree of positive correlation with return on shareholders' funds ratio and return on total assets ratio, whereas it has negative correlation with net profit ratio, operating profit ratio and return on capital employed ratio. The net profit ratio is negatively correlated with operating profit ratio,

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return on shareholders' funds ratio, and return on capital employed ratio and return on total assets ratio. The operating profit ratio has close positive correlation (0.710) with return on capital employed ratio. Return on shareholders' funds ratio has high degree (0.842) of positive correlation with return on total assets ratio.

SUMMARY OF THE STUDY

In this study was attempt has been made to examine the ability of the wind energy to meet their short-term obligations. There is no significant difference in the current ratio, quick ratio and super quick ratio of the wind energy during the study period. The current ratio of the wind energy shows poor liquidity position and they are not able to pay their current liabilities in time without facing difficulties, whereas, the quick ratio of the mills shows satisfactory position. There exists unsatisfactory position in the super quick ratio. The variation in the current ratio and super quick ratio is found to be high, whereas the variation in the quick ratio is found to be high. There has been close positive correlation between current ratio and quick ratio. There has been a positive correlation between the quick ratio and super quick ratio. To conclude, the current ratio and quick ratio are not satisfactory during the study period.

This study has been made to measure the long term solvency position of the wind energy. There is a significant difference in the debt-equity ratio, proprietary ratio, solvency ratio and capital gearing ratio between the wind energy during the study period. However, there is no significant difference in the fixed assets ratio between the wind energy. There is a wide fluctuation in the fixed assets ratio, debt-equity ratio, proprietary ratio, solvency ratio and capital gearing ratio. Debt equity ratio has a close positive correlation (0.408) with the solvency ratio in wind energy and the proprietary ratio has a close positive correlation. In this study was attempt has been made to measure the activity position of the select wind energy. There is a significant difference in the stock turnover ratio, debtors turnover ratio, creditors turnover ratio, cash turnover ratio, average collection period ratio, average payment period ratio, total assets turnover ratio and fixed assets turnover ratio of the wind energy the study period. However, there is no significant difference in the working capital turnover ratio between the wind energy. There is a wide fluctuation in the stock turnover ratio, total assets turnover ratio and fixed assets turnover ratio in SPB. In case of debtor’s turnover ratio, creditor’s turnover ratio, working capital turnover ratio, cash turnover ratio, average collection period ratio and average payment period ratio, there is a wide fluctuation in wind energy. The debtor’s turnover ratio of the wind energy has close positive correlation (0.909) with the working capital turnover ratio. The total assets turnover ratio of the wind energy is closely associated (0.931) with the fixed assets turnover ratio. The researchers were attempt has been made to assess the profitability position and the impact of activity ratios on the profitability of the select wind energy. There is a significant difference in the gross profit ratio and operating profit ratio between the wind energy. However, there is no significant difference in the net profit ratio, return on capital employed ratio, return on shareholders' funds ratio, and return on total assets ratio between the wind energy. There is consistency in the gross profit ratio, net profit ratio, operating profit ratio, return on capital employed ratio, return on shareholders' funds ratio, and return on total assets ratio of the wind energy during the study period. The operating profit ratio has close positive correlation (0.907) with return on capital employed ratio, and the return on shareholders' funds ratio has high degree (0.842) of positive correlation with return on total assets ratio in wind energy.

7. CONCLUSION

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Wind resources have been measured at 789 locations till 31.03.2014 cumulatively and 237 stations have been found to have wind power density (WPD) in excess of 200 W/m2 at 50 m above ground level. As on March 2014, 157 wind monitoring stations are in operation in 17 States and 1 Union Territory (including 82 stations currently commissioned). Wind energy industry is one of the key industries of a country and it supplies various types of power supply. The wind energy face the problems such as inadequate short-term liquidity, improper utilization of working capital, inefficiency of cash management, delay in payables, idle of total assets, and poor profitability. The researcher has suggested suitable measures to improve the financial health of the select wind energy.

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