

A Study on Performance Evaluation of Wind Turbines 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. 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. Wind shear measurement with 120m tall mast at Kayathar has been commissioned and dedicated to the Nation by the Secretary, MNRE. 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. If this study provokes the people concerned to take some positive measures in order to improve the financial health of the wind energy the researcher will feel amply rewarded.

1. INTRODUCTION

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.

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, 2014] 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.

2. NEED FOR THE STUDY

The 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 a 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

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.

6. 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.

7. REVIEW OF LITERATURE

K.Vimala, S.Rajeshwari(2014) the proposed model enables the management of vibration as mechanical and the increase in temperature of the wind turbine using the methods developed. The software allows user interaction and the model proposed by a user interface, in assistance of the result making decision to avoid catastrophic effects on the vibration cyclic regime and excessive temperature the windings and rotating mechanical couplings can cause the small wind turbines. Future work of this paper consists of two stages for monitoring and controlling the wind turbine, while concerning the first stage the rapid increase in temperature up to the threshold value leads to automatically cooling and the fan also in on stage. In stage two, increase in vibration causing the sms to be received to the user and the wind turbine set to off stage, by decreasing the threshold value.

E. Lantz and M. Hand (2012) the past 30 years, the cost of wind energy has significantly decreased, due to both capital cost reductions and performance improvements. However, from roughly 2004 to 2009, continued performance increases were not enough to offset the sizable increase in capital costs of this time period, resulting in an overall increase in the cost of wind energy. Nevertheless, as capital costs have moderated from their 2009–2010 levels, the cost of wind energy has fallen and is now at an all-time low within fixed wind resource classes. Looking forward, a variety of factors suggest that the LCOE of wind energy will continue to fall on a long-term global basis and within fixed wind resource classes. Most recent estimates project that the LCOE of onshore wind could fall by 20%–30% over the next two decades.

Wagner Sousa de Oliveira[2012] Practical realization of the general methodological approach to financial and economic analysis and efficiency evaluation of the investment projects in renewable energy technologies (wind energy) requires a sufficiently vast database including legal, reference, marketing, technical, and other information about the project itself and the conditions for its implementation. Most of this information (especially that referring to the future) is of prognostic nature and is not sufficiently full and precise, which tells on the feasibility estimates and project efficiency that depend on the realization conditions. In view of importance of this problem, much attention is paid to the methods of financial and economic analysis and efficiency evaluation of the investment projects in the context of risk and uncertainty. Choice of particular methods to analyze investment project risks depends on the factors such as the project scale, completeness of the information base, requirements on the depth of analysis and degree of project reliability.

LIQUIDITY POSITION LONG TERM SOLVENCY AND ACTIVITY PARAMETERS OF THE WIND TURBINES IN TAMILNADU

The Financial performance of any organization is usually judged in terms of its liquidity, long-term solvency, activity and profitability. Liquidity refers to the ability of a concern to meet its current obligations as and when they become due. A firm should ensure that it does not suffer from lack of liquidity, and also that it should not possess too much liquidity as it hampers the profitability. The short-term obligations are met by realizing funds from current, floating or circulating assets. The current assets should either be liquid or near liquidity.

ASSOCIATION BETWEEN CURRENT RATIO AND QUICK RATIO OF THE WIND ENERGY

YEAR	CURRENT ASSETS	QUICK ASSETS	CURRENT LIABILITY	CURRENT RATIO	QUICK RATIO
2004-2005	98,19,18,31	9,80,22,852	2,25,88,288	4.34	4.33
2005-2006	15,12,11,251	-	29,02,4342	5.20	5.20
2006-2007	13,47,30,147	13,40,88,982	45,0734,386	0.29	0.29
2007-2008	8,66,78,910	86,144967	7,09,70,531	1.22	1.21
2008-2009	26,98,22,476	26,91,06,312	8,10,38,455	3.33	3.32
2009-2010	350, 105,541	34,36,65,916	109,064,768	3.21	3.15
2010-2011	51,97,18,368	51,87,33,831	39,10,01,757	1.32	1.31

2011-2012	41,07,92,625	40,91,80,241	15,1905,234	2.70	2.69
2012-2013	48,79,96,122	48,57,72,846	16,28,62,440	2.99	2.98
2013-2014	35,94,54,686	35,65,76,538	17,81,43,301	2.01	2.00

Source: Annual Reports 2004-2005 to 2013-2014

TABLE NO 1

RELATIONSHIP BETWEEN CURRENT RATIOS AND QUICK RATIO OF WIND ENERGY

PARTICULARS	MEAN	N	STD. DEVIATION	CALCULATED T VALUE	DF	SIGNIFICANCE
Current ratio	2.6610		10	1.49237	2.4149	0.039 significance
Quick ratio	2.6480		10	1.49055		

Primary data

TABLE NO 2

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.

ANOVA OF THE CURRENT RATIO AND QUICK RATIO

	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG.
Between Groups	5.709	2	2.854	1.394	.309
Within Groups	14.336	7	2.048		
Total	20.044	9			

Primary data

TABLE NO 3

H₀ (Null hypothesis) = There is no significant mean variation between current ratio and quick ratio

H₁ (Alternate hypothesis) = There is significant mean variation between current ratio and quick ratio

The above table shows that the effectiveness of wind energy system based on satisfaction of the ratios. The F value is 1.394 and it is significant at the level of significance .144 at the degrees of freedom 1. In F test if the significant value is above 0.05 then Accept null hypothesis and reject the alternate hypothesis. And this study shows there is no significant mean variation between current ratio and quick ratio.

QUICK RATIO AND SUPER QUICK RATIO OF THE WIND ENERGY

YEAR	CASH	CURRENT LIABILITY	SUPER QUICK RATIO	QUICK RATIO
2004-2005	2,31,62,132	2,25,88,288	1.02	4.33
2005-2006	7,39,97,252	29,02,4342	2.54	5.20
2006-2007	13,84,46,236	45,0734,386	0.30	0.29
2007-2008	17,07,72,014	7,09,70,531	2.40	1.21
2008-2009	19,62,27,653	8,10,38,455	2.42	3.32
2009-2010	30,07,91,068	109,064,768	2.75	3.15
2010-2011	43,19,04,233	39,10,01,757	1.10	1.31
2011-2012	31,96,02,268	15,1905,234	2.10	2.69
2012-2013	39,45,55,090	16,28,62,440	2.42	2.98
2013-2014	49,82,54,630	17,81,43,301	2.79	2.00

Source: Annual Reports 2004-2005 to 2013-2014

TABLE NO 4

RELATIONSHIP BETWEEN QUICK RATIO AND SUPER QUICK RATIOS OF THE WIND ENERGY

	MEAN	N	STD. DEVIATION	CALCULATED T VALUE	DF	SIGNIFICANCE
Quick ratio	2.6480	10	1.49055	1.513	18	0.165
Super quick ratio	1.9840	10	.86016			Significance

Primary data

TABLE NO 5

The calculated t value of the super quick ratio (1.513) is less than the table value (2.878) at 1 per cent level of significance. It indicates that there is no significant difference in the super quick ratio between quick ratio and super quick ratio. Therefore, the null hypothesis is accepted. The average quick ratio of 2.6480 and Super quick ratio 1.9840 are 0.16. It reveals that there exists unsatisfactory position in the super quick ratio of and it is unable to pay its quick liabilities in time without facing difficulties.

ANOVA ASSOCIATION BETWEEN QUICK RATIO AND SUPER QUICK RATIO

	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG.
Between Groups	19.938	8	2.492	43.118	.117
Within Groups	.058	1	.058		
Total	19.996	9			

Primary data

TABLE NO 6

H₀ (Null hypothesis) = There is no significant mean variation between quick ratio and super quick ratio

H₁ (Alternate hypothesis) = There is significant mean variation between quick ratio and super quick ratio

The above table shows that the effectiveness of wind energy system based on satisfaction of the ratios. The F value is 43.118 and it is significant at the level of significance .177 at the degrees of freedom 1. In F test if the significant value is above 0.05 then reject null hypothesis and accept the alternate hypothesis. And this study shows there is no significant mean variation between quick ratio and super quick ratio.

INTER-RELATIONSHIP AMONG THE LIQUIDITY RATIOS

A number of financial activities are interconnected. Therefore, the performance of a particular activity may influence another activity. Liquidity ratios are interrelated. Therefore, an attempt is made to find if there is any relationship among the liquidity ratios of the wind energy.

INTER-CORRELATIONS AMONG THE LIQUIDITY RATIOS

	CURRENT RATIO	QUICK RATIO	SUPERQUICKRATIO
Current ratio	1.000	1.000	.407
Quick ratio		1.000	.404
Superquickratio			1.000

Primary data

TABLE NO 7

From the above table it is inferred that there has been a close positive correlation between current ratio and quick ratio in (1.000) followed by (1.000). Similarly, there is a significant positive correlation between the quick ratio and super quick ratio in (0.407) followed by (0.404).

RELATIONSHIP BETWEEN SOLVENCY RATIO AND CAPITAL GEARING RATIOS OF THE WIND ENERGY

	MEAN	N	STD. DEVIATION	CALCULATED T VALUE	DF	SIG.
Solvency ratio	.7280	10	.15411	5.149	18	.001
Capital gearing ratio	3.3440	10	1.68334			

Source: primary data

TABLE NO 8

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 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.

ANOVA OF THE SOLVENCY RATIO AND CAPITAL GEARING RATIO

	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG.
Between Groups	2.025	1	2.025	.708	.424
Within Groups	22.875	8	2.859		
Total	24.900	9			

Sources: primary data

TABLE NO 9

H₀ (Null hypothesis) = There is no significant mean variation between solvency ratio and capital gearing ratio

H₁ (Alternate hypothesis) = There is significant mean variation between solvency ratio and capital gearing ratio.

The above table shows that the effectiveness of wind energy finance system based on satisfaction of the ratios. The F value is .708 and it is significant at the level of significance.424 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 solvency ratio and capital gearing ratio.

INTER-RELATIONSHIP AMONG THE LONG TERM SOLVENCY RATIOS

An attempt has been made to find out if there is any relationship among the long term solvency ratios of the select wind energy.

INTER-CORRELATIONS AMONG THE LONG TERM SOLVENCY RATIOS OF THE WIND ENERGY

	FIXED ASSETS RATIO	DEBT EQUITY RATIO	PROPRIETARY RATIO	SOLVENCY RATIO	CAPITAL GEARING RATIO
Fixed assets ratio	1.000	-.102	-.452	.375	.557
Debt equity ratio		1.000	-.185	.408	-.210
Proprietary ratio			1.000	-.075	-.414
Solvency ratio				1.000	.129
Capital gearing ratio					1.000

Sources: primary data

TABLE NO 10

It is inferred from the above inter-correlation analysis that the fixed assets ratio of the wind energy system has a moderate negative correlation with the proprietary ratio, solvency ratio and capital gearing ratio. Debt-equity ratio has a close positive correlation (0.408) with the solvency ratio, whereas it has negative correlation with the proprietary ratio. The proprietary ratio has low degree of correlation with the capital gearing ratio. The solvency ratio has a moderate correlation with the capital gearing ratio.

RELATIONSHIP BETWEEN STOCK TURNOVER RATIOS AND DEBTOR'S TURNOVER RATIO OF THE WIND ENERGY

	Mean	N	Std. Deviation	Calculated t value	Df	Sig
Stock turnover ratio	12.1600	10	6.23299	5.608	18	0.001
Debtors turnover ratio	1.9170	10	.75613			

Sources: primary data

TABLE NO 11

The calculated t value of the stock turnover ratio and debtor's turnover ratio between the wind energy are 5.608 which is greater than the table value of 2.878 at 1% level of significance. This means that the test is significant. There is a significant difference in the stock turnover ratio and debtor's turnover ratio between the wind energy. Therefore, the null hypothesis is rejected. The mean of the stock turnover ratio and debtor's turnover ratio are 12.16 and 1.91 respectively. The stock turnover ratio and debtor's turnover ratio are satisfactory.

ANOVA OF THE STOCK TURNOVER RATIO AND DEBTOR'S TURNOVER RATIO

	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG.
Between Groups	.225	1	.225	.960	.356
Within Groups	1.875	8	.234		
Total	2.100	9			

Sources: primary data

TABLE NO 12

H₀ (Null hypothesis) = There is no significant mean variation between stock turnover ratio and debtors turnover ratio

H₁ (Alternate hypothesis) = There is significant mean variation between stock turnover ratio and debtors turnover ratio

The above table shows that the effectiveness of wind energy finance system based on satisfaction of the ratios. The F value is .960 and it is significant at the level of significance 0.356 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 stock turnover ratio and debtor's turnover ratio.

INTER-RELATIONSHIP AMONG THE ACTIVITY RATIOS

An attempt has been made to find out if there is any relationship among the activity ratios of the select wind energy. Inter-correlation analysis has been employed to find out the relationship among the activity ratios.

INTER-ITEM CORRELATION MATRIX

	STOCK TURNOVER RATIO	DEBTORS TURNOVER RATIO	CREDITOR TURNOVER RATIO	WORKING CAPITAL TURNOVER RATIO	CASH TURNOVER RATIO	AVERAGE COLLECTION PERIOD	AVERAGE PAYMENT RATIO	TOTAL ASSETS TURNOVER RATIO
Stock turnover ratio	1.000	.643	-.184	.104	.406	.733	.594	.265
Debtors turnover ratio		1.000	-.126	.631	.129	.979	.620	.644
Creditor turnover ratio			1.000	-.227	-.415	-.075	-.053	-.234
Working capital turnover ratio				1.000	-.237	.552	.535	.672
Cash turnover ratio					1.000	.158	.103	.024
Avg. collection period	.					1.000	.672	.623
Avg. payment period							1.000	.200
Total Assets turnover ratio								1.000

Sources: primary data

TABLE NO 13

It is inferred from the above inter-correlation analysis that the stock turnover ratio of the wind energy has a moderate positive correlation with the debtor's turnover ratio, working capital turnover ratio, total assets turnover ratio and fixed assets turnover ratio. The debtor's turnover ratio of the wind energy has close native correlation (-.237) with the working capital turnover ratio. It has a moderate correlation with the creditor's turnover ratio, total assets turnover ratio and fixed assets turnover ratio. There is a low degree of correlation between cash turnover ratio and total assets turnover ratio and fixed assets turnover ratio in wind energy. The total assets turnover ratio of the wind energy is closely associated (0.931) with the fixed assets turnover ratio.

IMPACT OF ACTIVITY RATIOS ON THE NET PROFIT RATIO OF THE WIND ENERGY

INDEPENDENT VARIABLES	B	STD. ERROR	BETA	T	SIG
(Constant)	21.101	17.777		1.187	.301
Stock turnover ratio	.254	.969	.126	.262	.806
Debtors turnover ratio	-15.933	10.176	-.959	-1.566	.192
Creditors turnover ratio	.061	1.327	.017	.046	.965
Working capital turnover ratio	19.409	11.896	.852	1.632	.178
Cash turnover ratio	1.801	.959	.753	1.877	.134

Sources: primary data

TABLE NO 14

MULTIPLE CORRELATION COEFFICIENTS BETWEEN ACTIVITY RATIOS AND NET PROFIT RATIO

R	R SQUARE	ADJUSTED R SQUARE	STD. ERROR OF THE ESTIMATE
.798 ^a	.638	.185	11.33931

Sources: primary data

TABLE NO 15

There is a high degree of positive correlation between net profit ratio and selected activity ratios of the wind energy. The R square value indicates that variation in the net profit ratio in The F values indicates that the multiple correlation coefficients are not significant in wind energy.

IMPACT OF ACTIVITY RATIOS ON THE OPERATING PROFIT RATIO OF THE WIND ENERGY

INDEPENDENT VARIABLES	B	STD. ERROR	BETA	T	SIG
(Constant)	57.281	27.840		2.058	.109
Stock turnover ratio	1.890	1.517	.616	1.246	.281
Debtors turnover ratio	.490	15.936	.019	.031	.977
Creditor turnover ratio	-2.605	2.079	-.480	-1.253	.278
Working capital ratio	3.393	18.630	.098	.182	.864
Cash turnover ratio	-1.062	1.503	-.292	-.707	.519

Sources: primary data

TABLE NO 16

MULTIPLE CORRELATION COEFFICIENTS BETWEEN ACTIVITY RATIOS AND OPERATING PROFIT RATIO

R	R SQUARE	ADJUSTED R SQUARE	STD. ERROR OF THE ESTIMATE
.785 ^a	.617	.138	17.75864

Sources: primary data

TABLE NO 17

There is a moderate correlation between operating profit ratio and selected activity ratios of the wind energy. The R square value indicates that 61.7% variation in the operating profit ratio in wind energy have been explained by all independent activity ratios altogether. The F values indicate that the multiple correlation coefficients are not significant in wind energy. The selected activity ratios such as stock turnover ratio, debtor's turnover ratio, creditor's turnover ratio, working capital turnover and cash turnover ratio do not have significant impact on the operating profit ratio of the select wind energy.

8. 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. The calculated t value of the super quick ratio (1.513) is less than the table value (2.878) at 1 per cent level of significance. It indicates that there is no significant difference in the super quick ratio between

quick ratio and super quick ratio. Therefore, the null hypothesis is accepted. The average quick ratio of 2.6480 and Super quick ratio 1.9840 are 0.16. It reveals that there exists unsatisfactory position in the super quick ratio of and it is unable to pay its quick 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 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 debtor's turnover ratio and creditor's turnover ratio. The calculated t value of the creditor turnover ratio and working capital turnover ratio between the wind energy (3.134) is less than the table value (2.878) at 1% level of significance. This test is not significant. This means that there is no significant difference in the creditor turnover ratio and working capital turnover ratio. Therefore, the null hypothesis is accepted. The creditor turnover ratio and working capital turnover ratio are 4.9070 and 1.2550 respectively. Creditor turnover ratio and working capital turnover ratio of the wind energy is not satisfactory during the study period. 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 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, 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, 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.

9. 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. 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. 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.

10. CONCLUSION

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. The over the 108 consultancy projects involving micro sting, to verification of data collection procedure and for preparation of due diligence reports. 11 new monitoring stations have been installed under various consultancy projects. The commissioned 100m tall guyed mast for Offshore Wind Resource Assessment at Dhanuskodi, has been instrumented for multilevel wind and meteorological measurements and the data is being acquired in C-WET's server through Internet since October, 2013. Wind shear measurement with 120m tall mast at Kayathar has been commissioned and dedicated to the Nation by the Secretary, MNRE. 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. If this study provokes the people concerned to take some positive measures in order to improve the financial health of the wind energy the researcher will feel amply rewarded.

11. REFERENCE

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