

AN ANALYSIS OF FINANCIAL PERFORMANCE AND INVESTOR'S EXPERIENCE OF INDIAN RENEWABLE ENERGY INDUSTRY

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ABSTRACT

The development of the renewable energy industry is an important support for the sustainable development of the social economy. It is strategic significance in economic and national security is immeasurable. The process of cultivating, developing, and upgrading the renewable energy industry in India is a comprehensive system that includes finance, resources, technology, and management. Renewable energy finance is a new area of public policy that requires innovation and research that will have a significant impact on investors in the World. Till today, many researchers think renewable energy is an issue of science and engineering, but the future of renewable energy is no longer about science and technology; it's all about access to finance. The renewable energy sector in India is growing rapidly and presents an opportunity for strong financial returns. The present research paper aims to know the financial performance of selected renewable energy companies of the Indian renewable energy industry through various financial ratios. The financial performance of any industry is effect to their respective industrial investors. Hence, investors' experience is analyzed. A specific group of investors who invest in the renewable energy industry is selected and posed a structured questionnaire to know their investment experience in the renewable energy sector in India.

Keywords: Financial Performance, Renewable Energy, Social Economy.

JEL Classification Codes: F36, P17, G23, Q29, Q43, L7

INTRODUCTION

Energy is a vital input to human welfare and a better standard of living. Today it is a commodity that has a significant impact on human life. It has strategic significance in economic and national security. The energy sector across the world is now dominated by conventional energy sources. In 2017, the conventional energy sector accounted for 81.9% of total final energy consumption

(Murdock et al., 2019). These conventional energy sources are characterized by inconsistent supply and unreliable for a sustainable future. And, using these makes the environment vulnerable and produces large amounts of CO₂ and other pollutants in the environment which contribute to global warming.

Environmental degradation and its threat to the health of human life lead to reevaluating our energy policy across the globe. To support this major shift in the energy area and develop sustainable earth, spurs the development of an alternative to conventional energy sources. The earlier effort made to control greenhouse gases through the Kyoto protocol agreement by “joint implementation” and “clean development mechanism” was a misconception from the very beginning (Brand, 2015). And the Kyoto protocol is based on the common principle with differentiated responsibilities. This protocol puts an obligation on reducing current emissions in industrialized and developed nations.

The failure of the Kyoto agreement leads to COP 21 Paris agreement. It aims to strengthen the global response to the threat of climate change in the context of sustainable development. It reflects equity and the principle of common but differentiated responsibilities, in the light of different national circumstances. Each Party shall prepare, communicate and maintain successive nationally determined contributions that it intends to achieve (Paris Agreement, 2015). Further, developed country Parties shall provide financial resources to assist the developing country Parties to achieve Intended nationally determined contributions and it's also led to technology transfer among the parties of the agreement.

Up to COP 21 agreements, the renewable energy industries in developing countries are in the chrysalis stage and struggling to settle by an inadequate supply of capital and lack of technology. The process of cultivating, developing, and upgrading the renewable energy industry in developing countries is a comprehensive approach that requires finance, resources, technology, and management. The COP 21 agreements eradicated the above problem. The agreement made a significant revaluation in the renewable energy sector of these countries by the inflow of huge investment with technology transfer. The major beneficiaries of the agreement are emerging economies includes China, India, South Korea, Brazil, South Africa, Saudi Arabia, and Iran, etc.

It's not hidden anymore that India has a vast supply of renewable energy sources and presents an opportunity for the fast-growing renewable energy industry. It has varied supporting climatic conditions and the potential of producing energy from different sources of renewable. The Indian renewable energy sector is the fourth most attractive renewable energy market in the world with a Renewable energy country attractiveness index (RECAI) score of 63 (Warren, 2015). India has the potentiality of producing 1000 gig watts (GW) and the country has set an ambitious target of 175 GW of renewable power by 2022. According to the Union Ministry of New and Renewable Energy (MNRE), renewable capacity has reached 81 GW, accounting for over 22 percent of the share in the total installed capacity of the country (Priyavrat Bhati, 2019).

The Government of India is committed to increased use of renewable energy sources and is already undertaking various large-scale sustainable power projects and promoting green energy heavily (BRISCON, 2019) The capacity of wind energy in India has increased by 1.7 times in the last 4 years. Solar power capacity has increased by more than 11 times in the last five years from 2.6 GW to 28.18 GW in March 2019. Wind power accounted for the highest at 46% (around 36 GW), followed by solar with a share of 36% (30 GW). The remaining market was captured by biomass at 12% (9 GW) and small hydro projects catering to 6% (5 GW) (Invest India, 2019)

India intended to coming with numerous projects with different ideas and technologies, to increase the use of renewable energy and decrease the carbon footprints in the economy. Several policies were undertaken to encourage investment in the area. To fulfill the needs and complete the project successfully, the Indian renewable energy sector is in expectation of huge investment inflow from both domestically and across the globe. The country committed to investing \$11 billion, which includes a solar investment of \$6.9 billion while wind investment was \$4.1 billion (Inger Anderson, 2019). According to data released by the national investment promotion and facilitation agency, FDI inflows in the Indian non-conventional energy sector between April 2000 and June 2018 stood at US\$ 6.84 billion. And more than US\$2.10 Billion FDI invested through equity.

In the above scenario of huge expansion and investment inflow in the Indian renewable energy sector, there is a need of reviewing the performance of the renewable energy industry and it needs to be correlated with the investor's experience. Hence, this study attempts to measure the financial performance of the renewable energy industry in India. To achieve this goal, the study has used various financial ratios to determine the financial performance of renewable energy companies. And, structured questionnaires are used to collect the experience of investors. The objective of the study in this regard as follows.

- To analyze the financial performance of selected renewable energy companies in India
- To analyze the perception of Indian renewable energy Industry Investors over the investment in the renewable energy sector.

LITERATURE REVIEW

Clean/renewable energy is a cornerstone of better earth. It offers our planet a chance to reduce carbon emissions, clean the air and put our civilization on a more sustainable footing. It also offers countries around the world chance to improve their energy security and spur economic development (Kumar et al., 2010). Renewable energy avoids greenhouse gas emissions that warm our planet. It improves air quality and human health. Investing in renewable energy is also an economic opportunity. It is a decision that investors around the world have been increasingly making for a decade. Renewable energy is considered a more desirable source of fuel than other fuels due to the absence of risk and disasters.

Three primary motivators that stimulate the growth of the renewable energy industry: energy security, economic impacts, and carbon dioxide emission reduction (Abolhosseini, 2014). UNEP report reveals that Global investment in the renewable energy industry hit \$272.9 billion in 2018 (Inger Anderson, 2019). The next decade will see further growth and penetration of the renewable energy industry in various countries. Clean and green power is the longer and idealistic aspiration for a sustainable globe. It requires Technology improvement, innovations, and operational flexibilities (Inger Anderson, 2019). The important spur for the renewable energy industry lies with the constraint of the cost, if it's achieved, the energy mix will change itself. Technology needs to be re-engineered to achieve the above objective.

To support the effort of the world in the sustainable development of the earth and increased use of renewable energy, the Government of India (GoI) has undertaken several policy measures to decrease the carbon emission from both generation and demand-side while meeting its energy need of its citizens. On the supply/generation side it's planned to increase the greater use of renewable energy by promoting the renewable energy industry in its economy. India planned to increase its renewable energy capacity from 80.46 GW to 175 GW by the year 2022 through increased use of solar and wind (INDIA'S INTENDED NATIONALLY

DETERMINED CONTRIBUTION, 2015). With the accomplishment of this ambitious target, India will become one of the largest Green Energy producers in the world (Year-End Review, 2018). On the demand side, efforts are being made to use energy efficiently through various innovative policy measures by creating awareness among the citizens of the country. India intends to save 10% of its current energy consumption. Hence, its planned drastic management programs to replace existing low-efficiency home appliances in India. The government of India declared a voluntary goal of reducing the emissions intensity of its GDP by 20–25%, over 2005 levels by 2020 (Thambi, 2018)'. To support the above development, the share of renewable energy grid capacity is increased by 6 times i.e., from 3.9 GW (2%) to 36 GW (13%).

India's total demand for energy will more than double by 2030, while electricity demand will almost triple. Ensuring that India's growing population has access to energy, and meeting the country's ambitious economic growth targets, will require massive investments in the renewable energy industry. Investment in India's renewable energy sector has doubled over the past five years. At nearly USD 20 billion in 2018, it has surpassed capital expenditure in the thermal power sector. Ambitious targets, supportive policies, and falling technology costs spur the investment in the Indian renewable energy sector (Arjun Dutt, 2019)

With one of the world's largest and most ambitious renewable energy programs by surpassing several developed countries. India can take a leading role in a renewable energy transformation both regionally and globally (Gielen, 2019). The US-based Institute for Energy Economics and Financial Analysis (IEEFA) assessed that India will require \$500-700 billion for the renewable energy industry over the coming decade, to meet its renewable energy targets (Buckley, 2019). In 2017, India accounted for \$12.3 billion or close to 5% displaying the fastest expansion rate among all countries. This represented a 62% growth over the corresponding figure for 2016 which was \$7.6 billion.

The investment in the Indian renewable energy industry is characterized by high risk and low returns as of now. The further optimization and upgrade of the renewable energy industry cannot be separated from financial support. It's expected that the Indian renewable energy industry is in expectation of huge investment inflow across the globe. In the above context, there exists a good deal of interest in the study of financial performance and investors Experience of the renewable energy industry in India. However, this interest has not resulted in an inadequate number of empirical studies in India and across the world. It is also found that the majority of the literature has come from western nations and studies in this direction in India are very sparse. It is also pertinent to note that, there is a lack of studies that comprehensively examine the financial performance of the Indian renewable energy industry and its correlated investor's Experience. Hence, there is a need to fill this gap by embarking on an empirical study that looks into the financial performance of the renewable energy Industry and investors Experience.

RESEARCH METHODOLOGY

The research data is obtained from standalone annual financial statements of three well know renewable energy companies (i.e., Suzlon, Orient Green Power, and Indo wind energy) which were listed in the National Stock Exchange of India. Ten years annual published financial statements from 2010-11 to 2019-20 are collected and different financial data are derived to calculate key financial ratios which include Current ratio, Quick ratio, Debt equity ratio, Revenue from Operation per share, return on capital employed, return on asset, PBDIT per share and Return on Equity. The mean and Standard deviation of each financial ratio is computed to evaluate the financial performance of Renewable energy companies.

To analyze the experience of the investor's six major stockbroking agency clients were considered. Each client experience was analyzed. To obtain information, 15 questions for each client are prepared and posed to the respective client. The questionnaire includes a set of positive and negative Likert styles of questions. The scores of each respondent are computed by excluding a neutral score, to know whether the different broking agencies clients have the same or different experience towards investment in the renewable energy industry. The questionnaire was administrated to only selective clients who invest in the renewable energy industry. The data related to clients of stockbroking agencies were collected in the respective business premises. The sample design for the study as follows

SI.NO	Stock Broking Agencies	Number of clients/ investors under the study	Number of the clients/ investors who exposes to investment in the renewable energy industry	% of clients/investors who exposes to investment in the renewable energy industry
01	Angel broking	80	28	35.00
02	Asit C Mehta	65	22	33.85
03	Share Khan	43	18	41.86
04	Geojit Financial Service Ltd.	38	20	52.63
05	Indian Info Line	48	21	43.75
06	Karvy	55	22	40.00
	Total	329	131	41.18

The average percent of clients who exposes to investment in the renewable energy industry is 41.18 percent. Out of 6 stock broking agencies, Geojit financial service ltd investors are exposed to a high-level of renewable energy industry investment and Asit C Mehta stock broking agency clients expose to the low-level of renewable energy industry investment.

RESULTS AND DISCUSSIONS

The financing structure of the renewable energy industry in India is dominated by bank finances. The financing avenues are range from commercial banks to private equity investors and venture capital investors. This study considers three leading renewable energy-producing companies in India for analysis of financial performance and six major stockbroking companies to analyze the investor's Experience.

Table 1. Current and Quick Ratio Analysis

Renewable energy companies	Current Ratio					Quick Ratio				
	Parameters									
	Mean	Max	Min	Med	Std. Dev	Mean	Max	Min	Med	Std. Dev
Suzlon	0.74	1.09	0.15	0.77	0.28	0.59	1.02	0.09	0.60	0.27
Indo Wind Energy	2.03	5.86	0.14	1.60	1.70	1.73	4.53	0.10	1.47	1.37
orient Green Power	1.14	4.83	0.03	0.49	1.57	1.13	4.80	0.03	0.48	1.57

Source: Data Retrieved through Annual Financial Statements

Indo Wind Energy company with a current ratio of 2.03 and a quick ratio of 1.73 with a standard deviation of 1.60 and 1.37 maintained ideal/stable liquidity and shows sound financial stability which assures its stakeholder's adequate funds to pay current liabilities and working capital. Whereas Suzlon companies with a mean current ratio of 0.74 and quick ratio of 0.59 with a standard deviation of 0.28 and 0.27 maintained poor liquidity.

Table 2. Debt-Equity Ratio and Revenue from operation/Share calculation

Renewable Energy Companies	Debt - Equity ratio					Revenue from operation / Share				
	parameters									
	Mean	Max	Min	Med	Std. Dev	Mean	Max	Min	Med	Std. Dev
Suzlon	3.67	20.16	-5.42	2.14	7.01	13.89	38.66	0.71	11.71	11.02
<i>Indo Wind Energy</i>	0.50	1.20	0.37	0.43	0.25	3.13	9.59	1.74	2.45	2.30
orient Green Power	0.29	0.48	0.10	0.30	0.12	0.389	0.99	0	0.29	0.41

Source: Data Retrieved through Annual Financial Statement

Suzlon company maintained higher the Debt to Equity ratio (i.e., 3.67 with a standard deviation of 2.14) comparatively Indo Wind Energy (0.50 with a standard deviation of 0.25) and orient green power (0.29 with a standard deviation of 0.12). Suzlon is a more Debt oriented company, which means most of the earnings earned by Suzlon is used to pay off interest itself. A higher debt-equity ratio shows that the claims of the creditors higher which is unfavorable from the firm's point of view. Whereas both Indo Wind Energy and Orient Green Power companies are low leveraged/ geared companies. Since a high proportion of equity provides a larger margin of safety to them. It represents a satisfactory capital structure in the present context of the renewable energy industry in India. Revenue from operation per share of Suzlon company (13.89 with a standard deviation of 11.02) is higher compare to Indo wind energy company (3.13 with a standard deviation of 2.30) and Orient Green Power (0.389 with a standard deviation of 0.41) which indicates the future potentiality of higher return of Suzlon compare to other 2 companies.

Table 3. Return on Capital Employed and ROA calculation

Renewable Energy Companies	Return on Capital employed					Return On Asset				
	Parameters									
	Mean	Max	Min	Med	Std. Dev	Mean	Max	Min	Med	Std. Dev
Suzlon	2.38	33.98	-32.26	-0.29	18.50	-21.42	2.50	-86.98	-6.98	30.06
<i>Indo Wind Energy</i>	0.66	2.63	-0.89	0.60	1.00	-0.81	1.24	-6.77	0.04	2.57
orient Green Power	-4.36	4.28	-18.55	-0.76	7.91	-5.48	2.65	-17.31	-4.37	6.61

Source: Data Retrieved through Annual Financial Statements

The return on capital employed of Suzlon and Indo wind energy is positive with a mean score of 2.38 and 0.66 with a standard deviation of 18.50 and 1.00 respectively. Investors of Suzlon and Indo Wind Energy companies' investors have a satisfactory return on capital

employed but higher the standard deviation of Suzlon company shows greater variability in returns throughout its life span. Whereas orient green power investors have suffered loss over the capital employed with -4.36 with a standard deviation of 7.91. It shows that Suzlon and Indo wind energy companies used their capital efficiently compare to Indo wind energy limited. Whereas the return on asset of all the three companies is negative. It shows the inefficient use of capital assets employed in the renewable energy industry in India.

Table 4. PBDIT and ROE calculation

Renewable Energy Companies	PBDIT/ Share					Return on Equity				
	Parameters									
	Mean	Max	Min	Med	Std. Dev	Mean	Max	Min	Med	Std. Dev
Suzlon	0.24	4.45	-7.16	0.97	3.24	3.67	20.16	-5.42	2.14	7.01
<i>Indo Wind Energy</i>	1.69	2.96	0.75	1.66	0.59	-1.00	2.89	-9.91	0.09	3.96
orient Green Power	0.11	0.63	-0.18	0.05	0.27	-8.52	3.84	-26.88	-6.83	10.16

Source: Data Retrieved Through Annual Financial Statements

The Profit before Depreciation, Interest, and taxes (PBDIT) of all the three companies are positive but Indo Wind Energy companies as the highest PBDIT compare to the other two companies. Return on Equity of Suzlon company is positive compare to the other two companies. The Suzlon company offer a promising rate of return to investors with a mean score of 3.67 with a standard deviation of 7.01

Table 5. Different stock broking agencies score calculation

Sl.No	Stock Broking Agencies	Higher Extreme Score (1)	Lower Extreme Score (2)	(1) – (2) Positive score /Negative score	Remarks
01	Angel broking	62	76	-14	Negative Experience
02	Asit C Mehta	46	58	-12	Negative Experience
03	Share Khan	45	38	7	Positive Perception
04	Geojit Financial Service Ltd.	48	63	-15	Negative Experience
05	Indian Info Line	48	59	-11	Negative Experience
06	Karvy Ltd	58	67	-11	Negative Experience
	Total	307	361	-54	Negative Experience

Source: Primary Data

The difference between the high extreme score and the lower extreme score is negative i.e., -54 which indicates the Negative Experience of investors towards investment in the renewable energy industry in India. The clients of all the stockbroking agencies i.e., Angel

Broking, Asit C Mehta, Geojit financial service ltd, Indian info line, and Karvy ltd clients had negative experiences except clients of the share khan. Most of the small investors have lost their money in the investment in the renewable energy sector. The wealth of the renewable energy industry shareholders has come down drastically from the financial year 2010-11 to 2019-20. The capital of investors had been eroded from year to year. The returns on equity for the investors are very low and it's coming down year by year. The N numbers of small investors have shifted their investment from renewable energy sectors to other sectors of the Indian economy. But for the question of whether do, you believe that the renewable energy industry in India has a growth perspective or not, a large number of investors have agreed that investment in the Indian renewable energy industry has a great future and can expect a good return and increase in wealth.

CONCLUSION

The Indian renewable energy Industry still struggling to settle. As of now, the renewable energy industry in the recession stage. The various financial ratios indicate that the Indian Renewable energy industry is in crisis. It proved by financial indicators of above said three major companies. The Indian investors have a negative experience and lost confidence over the investment in the Indian renewable energy industry. Indian Renewable energy industry is still backed by the debt financing pattern and most of the revenue of renewable energy companies is used to pay off interest part of the debt. There is a need of reviving the Indian renewable energy industry through changing financing patterns. It needs equity market push in the renewable energy industry. The analysis seems that the Indian renewable energy industry is struggling to settle but also reveals a greater opportunity for future gain. Hence, it offers a wide-ranging future investment opportunity for investors.

REFERENCES

- Abolhosseini, S. H. (2014). A Review of Renewable Energy Supply and Energy Efficiency Technologies. *Institute of Labor Economics*, 8-19.
- Arjun Dutt, L. A. (2019). *Clean Energy Investment Trends 2019: Evolving Risk Perceptions for Grid-Connected Renewable Power Projects in India*. New Delhi: Council On Energy, Environment, and Water.
- Buckley, T. (2019). India needs \$500-700 billion in renewable energy: IEEFA. *The Economic Times*. Retrieved from <https://economictimes.indiatimes.com/industry/energy/power/india-needs-500-700-billion-in-renewable-energy-ieefa/articleshow/70703262.cms?from=mdr>.
- Brand, U. (2015, November 11). *Why the Kyoto Protocol Failed*. (The Rosa-Luxemburg-Stiftung) Retrieved from <https://www.rosalux.eu/topics/social-ecological-transformation/why-the-kyoto-protocol-failed>
- BRISCON. (2019, March 8). Government of India. Retrieved from investindia.gov.in
- Gielen, D. (2019). *RENEWABLE ENERGY PROSPECTS FOR INDIA*. Abu Dubai: IRENA.

Global Trends in Renewable Energy Investment (2019). Frankfurt: UN Environment's Economy & Frankfurt School-UNEP Collaborating Centre for Climate & Sustainable Energy Finance, BloombergNEF.

INDIA'S INTENDED NATIONALLY DETERMINED CONTRIBUTION. (2015). UNFCCC International: Retrieved from <https://www4.unfccc.int/sites/submissions/INDC/Submission%20Pages/submissions.aspx>

Inger Anderson, N. S. (2019). *Global Trends in Renewable energy investment*. Frankfurt: Frankfurt school of finance and management.

Kumar, A., Kumar, K., Kaushik, N., Sharma, S., & Mishra, S. (2010). Renewable energy in India: current status and future potentials. *Renewable and sustainable energy reviews*, 14(8), 2434-2442.

Murdock, H. E., Gibb, D., André, T., Appavou, F., Brown, A., Epp, B., ... & Sverrisson, F. (2019). Renewables 2019 global status report.

Paris Agreement. (2015). *Paris Agreement*. PARIS: United Nation. Retrieved from https://unfccc.int/sites/default/files/english_paris_agreement.pdf

Priyavrat Bhati, P. S. (2019). *The state of renewable energy in India - 2019 (A citizen report)*. New Delhi: Centre for Science and Environment.

Thambi, S., Bhattacharya, A., & Fricko, O. (2018). *India's Energy and Emissions Outlook: Results from India Energy Model*.

Warren, B. (2015). Renewable energy country attractiveness index (RECAI). *Ernst Young: London, UK*.

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