

Project Financing in Wind Energy Industry in Japan

Manish Mirani¹, Rajesh Sonar²

¹*Project Engineer, IBMS*

²*Director, IBMS*

BACKGROUND

The use of fossil fuels is more than double the use of any other sources of energy in Japan. The investment in fossil fuels also more than doubles the investment in other energy sources. Japan and other nations need to curb the menace of environmental degradation caused by fossil fuels. There is a need to increase the financing of the wind energy sector and have more private players involved. This research wishes to address the plight of financing wind energy projects in Japan. This study will be important in emphasizing the advantages of investing in renewable energy. Currently, Japan's electricity consumption shows a low percentage of renewable energy, and as a result, the sector is underfunded. The best way to provide sufficient financing and management of the wind energy industry will be advocated in the study. Acquiring vital information key to the successful compilation of this report may prove to be an uphill task. The chosen area of study and the target population is expansive beyond the scope of the possibility of this research with the time given. There is the issue of Corona Pandemic currently causing havoc globally. It will be almost impossible to visit the necessary government and corporate offices to acquire information on wind energy. This research report will take the shape of the institutionally provided report structure. A literature review on project management of wind energy will ensue. Analysis of literature on financing of the wind energy is in chapter five. A discussion of the findings and recommended solutions to the plight in financing wind energy projects will come after.

METHODOLOGY

The report utilized virtual interviews and questionnaires to acquire primary qualitative data on wind energy industry in Japan. All primary sources of information for this research were well informed of the

facts surrounding the research, and the purpose of this study. Apart from primary research, this report also includes a lot of information from secondary sources. Most of the secondary information was acquired from websites of energy-related entities from Japan and at the global level for a comparative approach. Additionally, scholarly books and articles from the Library of Japan via their online platform were used to affirm this study and give it credibility for use in Japan. This study was guided by a theoretical framework being an academic research. Two theories used in the study are the environmental economist theory and the principle-agent theory. The second theory analyzed the aspect of project financing and management in the wind industry of Japan.

In the environmental economist theory, the main notion is that the environment has good and amenities, and such amenities have a value. The goods entailed in this theory include clean water, fresh air, land, and good climates. When such amenities are overused or misused, it can lead to depletion or pollution. This warrants a monetary and time cost on humans in the effort to correct such an adversity on the environment. With wind energy being the second most prominent source of renewable energy after solar energy, there is the need to invest more into harnessing and producing wind energy in Japan. Currently, Japan imports more than 92% of its total energy, and it is one of the biggest expenditures of the limitedly resourced island nation. The principle-agent theory is one of the most prominent theory in economy and civil law. In this study, the theory will be analyzed in relation to the interaction between the government of Japan, being the principle, and individual investors and companies who benefit from the Feed-In Tariff (FIT) policy in Japan. FIT policies force energy merchants to hold back on their investments to force favorable and more profitable terms from the government. This in turn slows the investment into the renewable-energy sector

where the financial responsibility is solely left to the government.

This research takes a pragmatic approach, by combining a quantitative and a qualitative design to the study. Data on the prices, rates and investments into the wind industry by the government and private energy merchants was collected from respondents and from various verified secondary sources. The quantitative approach was also helpful in establishing the implications of wind energy on socio-economic lives of the people of Japan from a consumer's point of view. The aspect of noting down the trends in financing of wind power production was also critical to this research, and how future changes to the industry may affect the people and the environment was also a germane issue in this report. This research utilized subjective or judgement sampling method when choosing study participants. Due to the Corona Pandemic, it was possible to have various willing participants over virtual platforms such as Zoom and Google Meeting. Qualitative data was acquired through open ended survey interviews conducted via virtual platforms. Quantitative data was also acquired through secondary research of record about the Japanese energy sector for the last twenty years. All secondary information was collected from credible organizational websites, the Japanese National Library and accredited internet sources.

LITERATURE REVIEW

The startup and maintenance cost of any public project is an uphill task in terms of resources and expertise. Installing offshore wind turbines in Japan has increased the total costs of such projects and the time taken to complete them. This has been a plight and strain to the economy of the nation, calling for more investment into renewable energy sources. Since the beginning of the last decade, the world has continued to increase investment and funding of renewable energy sources (Okamura, 2020). Wind energy is the second largest source of renewable energy in the world, outranked only by solar energy. According to Ohba (2019), the impact of wind energy harnessing and production has been tremendously beneficial in reducing environmental pollution. Apart from ease on cost of energy, wind energy assures sustainability of the energy sector. Japan is one of the leading countries in use of offshore wind energy, and more investment

is being made in the sector daily. Wind energy in Japan is a public project with a characteristic high cost of initiating and maintaining. A single wind turbine costs \$3 million, producing around 3 Megawatts of power at a cost of \$1.3 million per megawatt. Japan has been increasingly spending on putting up offshore and onshore wind turbines. The over \$500 million invested by the government in the offshore wind harnessing plants is set to place Japan in the top five among nations producing most wind energy by the year 2022. Case Study

The Development Bank of Japan (DBJ) has launched a \$500 million project to increase Japan's wind energy production capacity. The project is having further been funded by other organization in the industrial and energy sectors. DBJ has plans to put up an offshore wind plant in Hokkaido and an onshore plant in Iwate, with an anticipated production capacity increase to 5000 megawatts. Such efforts by corporations in form of Research and Development funding have a pertinent part to play in the increase of percentage use of renewable energy.

DISCUSSION AND SOLUTIONS

Japan has continued to grow and expand its renewable energy sector but is yet to have projects with impact enough to shift the national energy revenue. High initial set-up costs, and the standard costs of such electricity per megawatt make it unprofitable for private investors to invest in such sectors. The risks associated with investing in the energy sector have barred and discouraged many private players from committing to the sector. Most of the wind turbines used in Japan are imported from China and other nations. This has contributed to the cost of setting up wind firms. To ensure quality, the government should sponsor more mechanical engineering students focused on wind harnessing engineering. The government can effectively direct investment in wind energy by the private sector.

CONCLUSION

This research has addressed the issue of private investors financing the wind energy sector in Japan. The importance of investing in renewable energy to replace the hazardous carbon fuels has been reiterated. Key recommendations have been made to correct such

discouragers to private investment in the sector by private players. One such recommendation is the shift of acquisition of wind turbines from importation to local manufacture to reduce the set-up costs. The report has also addressed the barriers to financing of the wind power sector in the country. It is therefore salient for amicable financing solutions to be adopted, and the most important one is indulgence of private investment.