



An Analysis of the Renewable Energy scenario in India and public engagement in adaptation of renewable energy sources.

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Abstract:

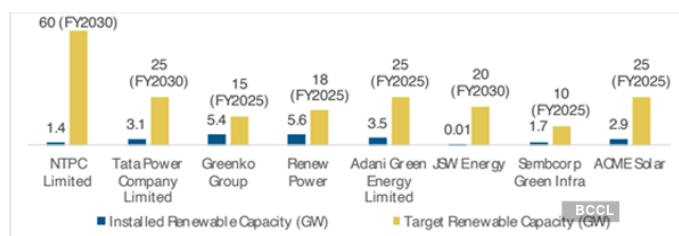
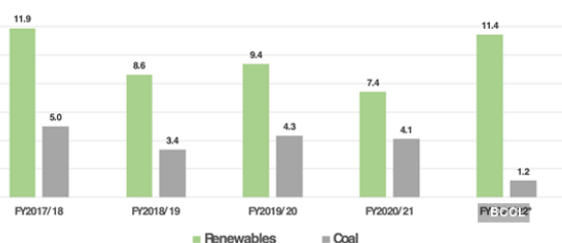
Energy is an important part of every life. There has been a shift from traditional energy sources to renewable energy in the global scenario. India has also committed to increase its share of clean energy from renewable energy sources. The Ministry of New and Renewable Energy (“MNRE”) has been taking several steps to ensure a clean energy future for the country. Indian consumers' awareness levels of the environmental impact of conventional energy sources has increased and making them seek alternative sources. They understand that renewable energy sources such as solar, wind, hydro, and biomass offer significant advantages over traditional forms of energy generation. The declining costs of renewable energy technologies and government incentives have also contributed to the rising awareness and adoption of these sources. As a result of these efforts, Indian consumers are increasingly embracing renewable energy options.. The Indian government's initiatives and policies promoting renewable energy have played a vital role in creating awareness among consumers. This paper has analyzed the Perceptions of the society and willingness to adapt alternate energy sources.

Keywords: Renewable Energy, Society’s perception, Government initiatives

I. INTRODUCTION

The Intergovernmental Panel on Climate Change (IPCC), in its special report on renewable energy sources and climate change mitigation, highlights that renewable energy has the potential to limit global warming to well below 2 degrees Celsius above pre-industrial levels. The International Renewable Energy Agency (IRENA) published a study indicating that renewable energy could meet more than half of the world's energy demand by 2030, significantly reducing carbon emissions and improving air quality. A comprehensive analysis showing that a shift to 100% renewable energy is technically and economically feasible across all sectors, including electricity, transportation, heating/cooling, and industrial processes Jacobson, M. Z. (2021). India has witnessed the participation of Private sector players like Adani Group, Jindal and Tata Power due to coal shortage and unreliability of imported sources of coal, overtaking the public sector. Use of clean renewable energy sources is economically more viable and yields better returns.

Coal vs Renewables Capacity Adds



Source: CEA, MNRE, IEEFA calculations * Till January 2022

Source: Company reports, IEEFA analysis

The Global Renewables Outlook report by IRENA (2020) emphasizes that renewable energy can drive economic growth, create jobs, enhance energy security, and improve public health by reducing air pollution and environmental degradation. The research showed that a renewable-based energy system would lead to substantial reductions in greenhouse gas emissions, while also providing economic gains through job creation and increased GDP. Brouwer, A. S., Van Den Broek, (2014).

II. LITERATURE REVIEW

Renewable Energy is defined as Any form of energy from solar, geophysical, or biological sources that is replenished by natural processes at a rate that equals or exceeds its rate of use (World Energy Assessment 2012)

For our study the term renewable energy refers to biomass energy, hydro energy (low impact), solar energy, wind energy, geothermal energy, and ocean energy. Wind and Solar are the Fastest Growing Sector. India has Fairly Large Renewable Energy Potential.

Renewable energy costs are still higher than existing energy prices. Renewable energy offers sustainable solutions. Solar and biomass technologies are most promising technological options, with mini hydro wherever it is available. Chien, F., Kamran, H. W., Albashar, G., & Iqbal, W. (2021).

High initial capital costs, risks of funding, heavy transaction expenses, technology prejudice, in addition to institutional factors and regulations, subsidies to the conventional forms of energy put renewable energy at an economic, regulatory, and institutional disadvantage relative to other forms of energy supply.

Previous studies on public perceptions of renewable energy have explored various aspects of societal attitudes, knowledge, and acceptance towards renewable energy technologies. These studies have shed light on factors influencing public perception, including socio-demographic variables, cultural and psychological factors, communication strategies, and the impact of awareness campaigns. Karasmanaki, E., & Tsantopoulos, G. (2021).

They have examined public attitudes towards specific renewable energy sources such as wind, solar, and hydro, as well as explored public opinions on topics such as energy system transitions, climate change, and the environmental impacts of renewable energy. The findings from these studies have provided valuable insights for policymakers, energy practitioners, and communicators, helping to inform decision-making processes, shape effective communication strategies, and address barriers to public acceptance and adoption of renewable energy resources. Liu, Y., Xu, M., Ge, Y., (2021).

Factors influencing public attitudes towards renewable energy encompass a range of socio-demographic, cultural, and psychological factors. For instance, age, gender, education, income, and political affiliation have been found to influence perceptions. A study by Poortinga et al. (2019) found that younger individuals, higher-educated individuals, and those with a stronger environmental worldview were more likely to support renewable energy.

Similarly, a research article by Boudet et al. (2014) identified income, education, and political ideology as key predictors of public support for renewable energy. Psychological variables such as pro-environmental values and personal efficacy have also been found to be strong predictors of public support Vesely, S., (2022).

Communication strategies play a crucial role in shaping public perception and awareness of renewable energy sources among Indian consumers. Effective communication can increase knowledge, address misconceptions, and foster positive attitudes towards renewable energy.

A study by Na Edwin, M., & Sekhar, S. J. (2022) examined the role of communication strategies in promoting renewable energy adoption in India. The research found that personalized communication, such as face-to-face interactions and community engagement, was effective in raising awareness and encouraging positive attitudes towards renewable energy technologies.

Bhardwaj, S., Nair, (2023). The study also highlighted the importance of using clear and concise messages that concentrate on the benefits of renewable energy, such as cost savings, energy independence, and environmental sustainability.

Overall, these studies highlight the importance of tailored communication strategies, including personalized interactions and social media engagement, in influencing public perception and awareness of renewable energy sources among Indian consumers. Irfan, M., Zhao, Z. Y (2021).

By employing effective communication techniques, stakeholders can foster positive attitudes, increase knowledge, and encourage the adoption of renewable energy technologies in India. Jabeen, G., Yan, Q., (2019).

III. DISCUSSION

Sustainability and environmental awareness are the driving factors behind every facet of life in a civilization that relies on renewable energy sources. The use of renewable energy sources including solar, wind, hydro, geothermal, and bioenergy has replaced the use of fossil fuels in this culture.

India has added 100 gigawatts of renewable energy by 2021 and proposes to make it 500 gigawatts by 2030. and has worked towards India's pledges to the Paris Agreement in December 2015, to increase its share of clean energy, with an added

emphasis on renewable energy, by increasing the share of non-fossil-based energy resources to 40 percent of installed electric power capacity by 2030 though statistics at that time showed that renewable sources did not contribute much to the total energy supply and electricity supply of the country.

Savaresi, A. (2016). Out of 6,41,423.39 KToe of total primary energy supply as of 2015-16, coal is the highest contributor to energy supply at 53.9 percent, followed by crude oil at 35.5 percent and natural gas at 7.38 percent (Centre Statistics Office, Ministry of Statistics and Programme Implementation 2017).

Supply of energy from renewable sources such as hydropower stands at 1.54 per cent and from solar, wind and other similar sources stands at 5.24 per cent. Energy supply from nuclear sources stands at 1.44 per cent. Osman, A. I., & Yap, P. S. (2023). The above data clearly proves that renewable sources are contributing a mere 6.78 per cent towards the country's energy supply.

A similar pattern is witnessed when one looks at the sources of electricity generation in the country. Coal again tops the charts with a 76.71 percent contribution towards Gross Electricity Generation in India as of 2015-16 (Central Electricity Authority, Ministry of Power 2016).

Surprisingly, hydropower follows coal with a 10.39 percent contribution. Then comes renewable energy sources at 5.36 percent, natural gas at 4.03 percent, nuclear power at 3.20 percent and diesel at 0.03 percent. The total contribution of all renewable energy sources to gross electricity generation stands at 15.75 percent. On the other hand, the contribution of renewable energy sources to all India installed generating capacity stands at 28.34 percent. Gutiérrez-Alvarez, R., Guerra, K., & Haro, P. (2023).

Thus, although we may be successfully proceeding towards our pledge under the Paris Agreement, we are still far behind in terms of using generating capacity towards actual generation and supply of electricity. Bi, S. L., Bauer, N., & Jewell, J. (2023).

The government is trying its best to promote the adoption of renewable energy sources by coming up with different incentives such as generation-based incentives, sector-wise incentives, concessional finance, subsidies etc. Das, S. S., Kumar, J., Dawn, S., & Salata, F. (2023).

The study also highlighted the importance of education and awareness campaigns in shaping public perception, as participants who had higher levels of knowledge and awareness about renewable energy showed more positive attitudes towards its adoption. Additionally, the study identified socio-economic factors as influential in shaping perceptions. Participants from urban areas and higher income brackets displayed greater acceptance of renewable energy compared to their rural counterparts and those with lower incomes.

Every house, structure, and piece of infrastructure has an effective energy system that uses the forces of nature to provide all the energy needed. Because of the huge decrease in greenhouse gas emissions brought about by the use of clean energy, the environment is healthier and the air is cleaner. People actively contribute to the creation of renewable energy, whether it is through home solar panels or neighbourhood-based projects. Renewable energy will be the foundation of a sustainable and successful future by protecting the environment and the welfare of future generations

IV. CONCLUSION

This study aims to investigate society's perception of renewable energy resources, focusing on understanding public attitudes, knowledge, and opinions towards renewable energy technologies. Programs that increase knowledge and understanding encourage responsible consumption and energy management, ensuring that resources are used effectively and sustainably.

Firstly, conducting in-depth studies to understand the specific factors that influence public perception in the Indian context is essential. This can involve investigating socio-cultural influences, economic considerations, and regional variations in perception. Such research can provide valuable insights into the barriers and drivers of public acceptance, enabling the development of targeted interventions. Secondly, exploring effective communication strategies tailored to the Indian context is crucial. Research should examine the most suitable channels, messages, and formats for reaching diverse segments of the Indian population. Understanding the unique cultural, linguistic, and literacy aspects of different regions can guide the development of clear, relatable, and culturally sensitive communication materials. Additionally, fostering public engagement and participation through community-based initiatives can enhance public perception. Encouraging involvement in decision-making processes, incorporating public feedback, and creating platforms for dialogue can help address concerns, build trust, and promote a sense of ownership among the public.

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