

Panacea to Issues and Challenges Confronting Implementation of Renewable Energy Projects in Tamilnadu – An Exploratory Study

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Abstract: *The growth in the use of renewable energy has been growing steadily over a decade or so. Several factors have contributed to this scenario like increasing energy costs, climate change, growing environmental concern, resource depletion et al. The stock of Fossil fuel is fast depleting. While the global coal reserve is expected to last for another 120 years, the available oil reserves is expected to meet 55 years of world production. This contributed to sharp rise in energy costs, which ultimately culminated to endeavors seeking independence from fossil fuels. This lead to higher investment in renewable energy projects and making them succeed. But implementation of renewable energy projects is fraught with multiple issues and challenges quite unique and distinct from other normal projects. This exploratory study seeks to digress such issues and challenges and suggests panacea to such illness.*

INTRODUCTION

Implementation of renewable energy projects is confronted with several challenges like poor maintenance, poor managerial ability, lack of awareness of renewable energy projects on the part of locals, et al. (Hermawati, Thoha, Grace, & Rosaira, 2010; Sambodo, 2015). Recent studies bring out the fact that complex renewable energy projects see the day light after overshooting the planned time frame and cost, and sporadically with technical glitches (Kerzner, 2009). Identifying the ingredients leading to the successful implementation of such assignments becomes a must for all stakeholders and beneficiaries. The present study seeks to identify the challenges and issues confronting the implementation of renewable energy projects and suggests an elixir to issues and challenges confronting implementation of renewable energy projects

RESEARCH SIGNIFICANCE AND GAP

The present study attempts to identify the factors which contribute to the failure and those which yield success in implementation of renewable energy projects in Tamilnadu. The findings from this exploration will make the project managers relook and reassess the contemporary project management practices. It will also contribute to the expansion of academic horizon presently available in the realm of renewable energy project management. Thus the results from this research will be of immense help to practicing managers and researches in this field.

Majority of researches available relate to implementation of renewable energy in western countries. Not many researches seem to have done with regard to successful implementation of renewable energy projects in India. No such research seem to be available with respect to Tamil Nadu. The present research seeks to fill this gap.

RESEARCH OBJECTIVES

This research entails the following objectives:

- (i) Identify the issues and challenges confronting implementation of renewable energy projects in Tamilnadu.
- (ii) Decipher the factors resulting in the successful implementation of such projects.

RESEARCH METHODOLOGY

Based on in-depth interviews with renewable energy projects managers, practitioners, decision makers, professionals and stakeholders across Tamil Nadu, the author has presented the challenges confronting the implementation of renewable energy projects and explore and suggest the tactics for overcoming them so as to successfully implement and sustain the renewable energy projects.

REVIEW OF LITERATURE

The growth in the use of renewable energy has been growing steadily over a decade or so. Several factors have contributed to this scenario like increasing energy costs, climate change, growing environmental concern, resource depletion et al. The stock of Fossil fuel is fast depleting. While the global coal reserve is expected to last for another 120 years, the available oil reserves is expected to meet 55 years of world production. This contributed to sharp rise in energy costs, which ultimately culminated to endeavors seeking independence from fossil fuels. This lead to higher investment in renewable energy projects and making them succeed.

Energy generated from non-fossil fuels are called Renewable energy or just simply, “renewables”. Examples include solar, wind and geothermal energy. According to Statistical Review of World Energy 2017, the consumption of renewable energy grew by 23.3% globally in 2016 and is now providing 7.3% of the world’s electricity. In comparison with 3.7% in 2010, the share has almost doubled.

A latest publication of the US based Institute for Energy Economics and Financial Analysis (IEEFA) states that Tamil Nadu is one of the top ten countries across the globe which seeks to meet a substantial portion of its energy needs from these eco-friendly renewable sources. The year 2016-17 saw Tamil Nadu source 14.3% of its energy needs from these sources. Further, the state has the highest capacity installation of 30 GW of renewable energy in India

“This rise in the use of renewables is predicted to coincide with a slide in coal’s share in Tamil Nadu’s electricity mix, from 69% in 2017 to 42% 10 years later,” says the World Economic Forum The state has also diversified into biogas and small hydro plants as well. “As of March 2017, the state had 1 GW of biomass and run-of-river small-scale hydro, 2.2

GW of conventional hydroelectricity, and 1 GW of gas fired power capacity operational (plus another 1 GW of gas under construction),” reports the IEEFA. In an interesting aside, it also hosts the second largest solar farm (Kamuthi) in the country with a capacity of 648 MW. This is a heartening development as it comes a time when the Government of India has set a target of sourcing 175 gigawatts of energy from renewable sources by 2022.

When it comes to renewable energy in India, one could consider Tamil Nadu as a pioneer of sorts. Most of its wind farms, for example, were built approximately 25 years back. Favourable climatic conditions prevailing in Tamil Nadu abet the use of solar and wind power. The state undergoes bright sunshine for more than 300 days in a year. Tamil Nadu experiences gale winds for nearly six months and modest winds for four months. The state’s sojourn into renewable energy began as an emergency attempt to fill the growing deficit between supply and demand of power.

Major industries like automotive parts, textiles, cement and leather-tanning, for example, demanded large amounts of power and consequently, the feed-in tariff (payments to ordinary energy users—people or businesses—for the renewable electricity they generate) for the wind energy sector was encouraging.

Earlier, the state power regulators had a stranglehold on determining prices but changed to an auction system in 2016.

With the local textile sector first grabbing the bull by its horns, Tamil Nadu also became one of the first states to allow industrial units to establish their own wind power plants. These 20-year-old wind farms owned by the Tamil Nadu Spinning Mills Association (TASMA) generates a little less than 40% of the state’s total wind energy capacity (3000 MW). The Muppandal wind farm outside Madurai, for example, generates 1.5 GW of energy, making it the largest wind farm outside China. With favourable tariff conditions, the state also made serious progress in the solar energy arena.

IEEFA has argued in its report titled ‘Electricity Transformation in India: A Case Study of Tamil Nadu’, it argued how the state’s growth in wind and solar energy generation isn’t enough.

“Tamil Nadu should raise its wind and solar energy capacity to 15 GW and 13.8 GW respectively by 2026-27 to deliver cheaper electricity to customers,” the report said. Further, the state should upgrade the wind farms with the latest sophisticated technology.

There are other concerns, as well. Meagre procurement by power utilities in the state has severely affected the viability of renewable energy assets.

Primarily, the major concerns stem from state regulation-related issues. For starters, the state-owned power utility Tangedco has proposed an additional imposition of taxes on rooftop solar plants, says this Times of India report.

Last July, Tamil Nadu was unable to use all the solar power it generated. In the wind energy sector, the government could stymie TASMA’s ability to drawing back the excess power it delivers to the power grid in the event of a shortage (wind banking). What one must understand is that TASMA generates and delivers excess wind energy to the power grid.

Tamil Nadu Generation and Distribution Corporation Limited (TANGEDCO) reported a loss of Rs. 3,783 crores during the financial year 2016-17. This has severely impacted their payments in time to power supplying sources. Consequently, the companies operating in this realm were unable to honour their financial commitments to banks. The pathetic regulatory state of affairs in power sector is also a matter of serious consideration.

DISCUSSION

The research has revealed several issues and challenges faced by the renewable energy project managers in their execution and sustenance of renewable energy projects. This section discusses at length such problems and also postulates suggestions for overcoming them

(A) IDENTIFIED CHALLENGES AND ISSUES CONFRONTING THE IMPLEMENTATION OF RENEWABLE ENERGY PROJECTS

The author's in-depth interviews with renewable energy projects managers, practitioners, decision makers, professionals and stakeholders across Tamil Nadu, revealed the following challenges and issues confronting the implementation of renewable energy projects:

Availability of land, their acquisition and protection:

Solar power plants demand huge parcels of land depending upon the type of the PV technology used. For instance a 1 MW of solar plant may approximately require five acres of land depending upon the type of PV technology used. Further such land must be non-agricultural, unused land free of trees and with good solar irradiance. Getting such a land is a challenging task.

Acquiring such a huge piece of land is also a problem, as most of the land is fragmented and appropriate relevant records may not be available.

After purchasing the land also the purchasers face undue harassment from vested interests in the local community form of instigated agitation or law suits etc.

Absence of proper financing mechanism:

A major part of required finance is done by commercial banks. But there is a feeling that the interest rate charged by them is on the higher side. This puts pressure on the bottom line of the projects. Moreover the period of finance is for a term of 12-16 years which again forces the project managers to pump in more equity which is not easy forthcoming.

Inadequate evacuation infrastructure:

Renewable energy mission needs a robust grid network. This a critical issue running for some time now. Generation of renewable energy is intermittent in nature. Evacuating the energy so produced also poses a problem as power grid is not in the close proximity of the power plant. Even when the grid is accessible, it results in aggregate technical and commercial losses during transmission. Exclusive transmission line for evacuation of power is the need of the hour.

Fluctuation in power generation:

Power generation from wind energy depends on nature. Consequently power generation from this source is subject to the vagaries of nature.

Lacking mandatory requirement:

There is no mandatory requirement on the part of consumers to go in for green renewable power.

Consequently this creates a sluggish in demand for the power. People seem to be remain insensitive to the potential of using such energy for domestic purposes. Government departments, public buildings, civic bodies are not mandated to meet their requirements from these sources.

Financial barriers:

Pecuniary impediments pose grave constraints to those private players who intend to take up these projects on a major scale. Despite granting liberal subsidies, players harbor a feeling that these technologies somehow seem to be marginalized in the overall energy landscape. Mass scale commercialization of renewable energy source depends upon availability of adequate financial resources which appears to be grossly lacking.

Off-shore wind energy yet remains to be tapped:

While western countries have gone in for exploitation of off-shore wind energy, it is yet to take off in a big way in our country, particularly Tamilnadu with a lengthy sea shore. Experience has shown that off-shore wind energy generation is far more consistent than on-shore generation.

Absence of curriculum on renewable energy power at school and college level:

There are no universities which offer exclusive degree or diploma in renewable energy. Even at school level they don't get due importance as much as they deserve. Eventually younger generation are not sensitized on this source of energy.

Prohibitive transportation cost:

A major hindrance face by project developers in the bio-mass sector is transporting the available waste in large quantities to the plant at an economical price. With surging fuel prices, transportation cost has sky rocketed to the chagrin of the managers.

Inadequate battery support:

Though the potential of using solar photovoltaic is very high Tamilnadu, it works only during daylight hours. To provide battery support during dusk it requires battery support. A lot needs to be done on this front.

ELIXIR TO AILMENTS OF RENEWABLE ENERGY PROJECTS – THE WAY FORWARD

1. Execution of green corridor:

The variability in the supply of solar and wind energy can be alleviated to a great extent through interconnections of transmission. Hence, the first priority for the state and central government should be to complete the transmission infrastructure through the \$3.5 billion green energy corridor program so that renewable power can be transmitted where it is needed. It may be highlighted that the transmission systems, which take up to five years, should be built ahead of renewable energy generation which entails 12-18 months to become operational. There are significant power surpluses in some pockets and power deficiency in others. New investment in transmission systems will help neutralize such disparities.

2. Invigorating the national power grid:

Hastening the completion of the power grid will enable the government to better manoeuvre power problems through efficient transmission system. The objective of “One Nation-One Grid-One Frequency” is necessary to get full utilization of the nearly 175 GW of solar and wind capacity proposed to be installed by 2022. Further, transmission lines within the state needs to be completed and modernized. This will also enable the government to take advantage of the vast amounts of solar energy available from Ladakh, a cold desert and Jaisalmer, part of the Great Indian Thar desert, to power future energy needs of heavy consumption areas.

3. Acknowledging the importance of electricity storage and encouraging it:

A vast majority of the people in the state have not adopted renewable energy power. Cost of storage appears to be an important impediment in mass adoption. The extreme weight of imported grid-scale batteries not only raises transportation costs but also results in other logistical issues. Hence the government should encourage battery manufacturing under the “Make in India” programme.

4. Provision of concessional finance:

Government should initiate steps to provide concessional finance for domestic players via nodal agencies who can tap funds in the international arena like Rural Electrification Corporation, Indian Renewable Energy Development Agency and Power Finance Corporation. To encourage financial discipline in the industry prompt repayment can be rewarded interest subsidy. Such an act can contribute towards growth in the industry. Extending tariff concessions, awarding growth based incentives and giving tax exemption for income generated from sale of power in the initial years can also be thought of by the government to boost growth in this sunrise sector.

5. Evacuation infrastructure:

For onward transmission of the energy generated in the power plant, there is an urgent requirement to set up sub-station and evacuation systems. Power grid needs to be installed in the close proximity of the plant site. The government must initiate steps to establish exclusive

transmission lines for transmitting energy from generation sources where energy production is intermittent in nature.

6. Leasing of land by Government:

As land cost occupies a significant portion of the cost, the State can provide land on lease to prospective promoters. This will significantly ease the financial burden of the promoters and attract more wind farm proposals.

7. Awareness campaign to be stepped up:

It is felt that the Government should step up an awareness of renewable energy in order to encourage its popularity and usage among the general public. Lack of awareness about renewable energy has contributed to its low demand. When the general public seizes the need and importance of renewable energy they shall fall in line and consequently the demand and sale of such energy is bound to go up.

8. Exploring the dimension of off-shore power plant:

With a long sea shore, the State should explore the possibility of setting up off-shore wind power plant. It is well established that energy generation from off-shore power plant is more consistent than on-shore plants. Western countries have already started tapping this source. Hence, Government should give a serious consideration to this alternative.

9. Use of renewable energy should be made mandatory:

Government should make it mandatory that all public buildings should meet 40% of their requirements from solar energy. This should be made applicable to energy requirements for street lighting also. It can also contemplate to replace 20% of their existing vehicle fleet with solar powered electric vehicles.

10. Encourage production of solar energy components:

The government should encourage and promote production of renewable energy components in the state. A single window clearing system may be put in place for speedy approvals within the prescribed time frame.

Conclusion:

Renewable energy generation on a large scale is sure to help in tackling the energy scarcity scattered across the state. Paucity of capital acts as a thorn in the execution of renewable energy projects. Growth in this sector depends upon adoption of newer avenues and technologies, favourable policies supported by innovative financing. Government should realize the long term benefits likely to accrue from this source and hence assign top priority to this realm to propel economic growth.

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