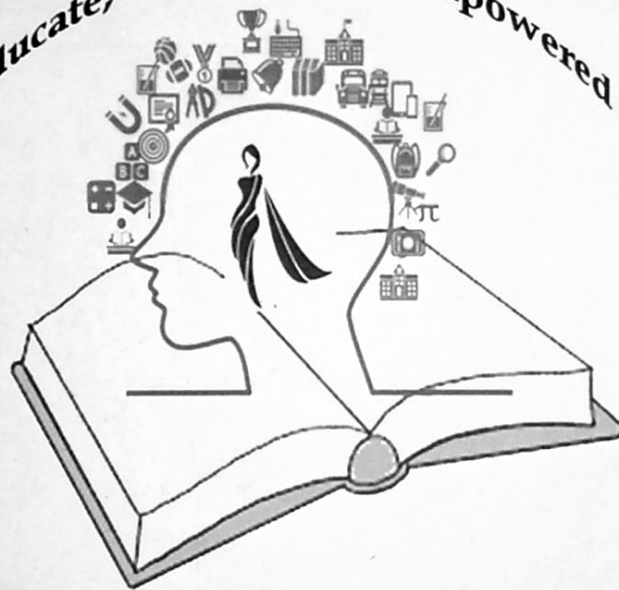


# Women Entrepreneurship - A Transformational Scripting for Success

*Educate, Innovate, Be Empowered*



**Avinashilingam Institute for  
Home Science and Higher Education for Women**  
(Deemed to be University Estd. u/s 3 of UGC Act 1956, Category A by MHRD)  
Re-accredited with A++ Grade by NAAC. CGPA 3.65/4, Category | by UGC  
Coimbatore - 641 043, Tamil Nadu, India

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# Rural Electrification: The Role of Entrepreneurship in Promoting Renewable Energy

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**Abstract---** Among the numerous variables that influence energy security, energy storage methods and solutions play a significant role. The process of storing energy from the power network in a form that can subsequently be utilised when converted back to electrical energy is known as electrical energy storage, or EES. Today, the majority of electrical energy is held in battery energy storage, which employs chemical energy, and hydroelectric energy storage, which accounts for about 99% of all EES globally. Each method has its own advantages and limitations. When there is minimal demand for electricity and a lot of it is produced affordably, it is primarily stored. The energy is then used when there is a high consumption of energy and a high cost of production, or when there are no other ways to produce electrical energy. With the expanding use of renewable energy sources, electrical energy storage has several applications, including in electrical gadgets, cars, and stationary energy resources. Due to low population size, reduced power consumer density, and lower utilization density, rural electrification is a challenging endeavour. The use of renewable energies promotes sustainable development in all countries. Entrepreneurs have a crucial role in promoting renewable energy sources because they alter the mix of manufacturing techniques, turning renewable energy ideas into workable electricity grids. This article explores the possibilities of rural electrification in India as well as the obstacles and knowledge gained in last-mile energy delivery. Rural entrepreneurship has a worldwide track record that supports transition to renewables through increased usage of renewable energy sources and SDG fulfilment.

**Keywords---** Energy Storage, Rural Electrification, Entrepreneurship, Sustainable Development Goals.

## Introduction

The development of efficient energy storage systems is essential in balancing the disparities in electricity supply and demand as well as in the process of reducing emissions the global economy due to rising energy consumption and variable renewable energy production [1,2]. In the context of the energy transition away from fossil fuels, energy storage has recently been the spotlight of discussions [3]. Electrochemical batteries are the most competitive storage technology and are beginning to enter a phase of wide-scale diffusion in several industries [4]. By balancing the power producing capabilities and load demand, the production and implementation of energy storage systems on a greater scale will be a crucial component of managing the renewable energy shift. It is vital in this situation for investigators and decision-makers to comprehend the underlying conceptual structure and significant interaction dynamics that may affect the future innovation trajectory. The sustainable development of electrical energy storage is the primary topic of this article [5].

## India's Current State of Rural Electrification

Since the 1950s, India has attempted to electrify its rural areas [6]. In order to enhance the nation's agricultural output, "electrification for irrigation" was the initial focus of India's rural electrification programme [7]. Later, electrification adopted a more specific strategy in recognition of how significant it was to provide energy to rural areas. Over the past 15 years, approximately 1,719,770 million has been spent in order to electrify every village and interconnect more than 99% of households [8].

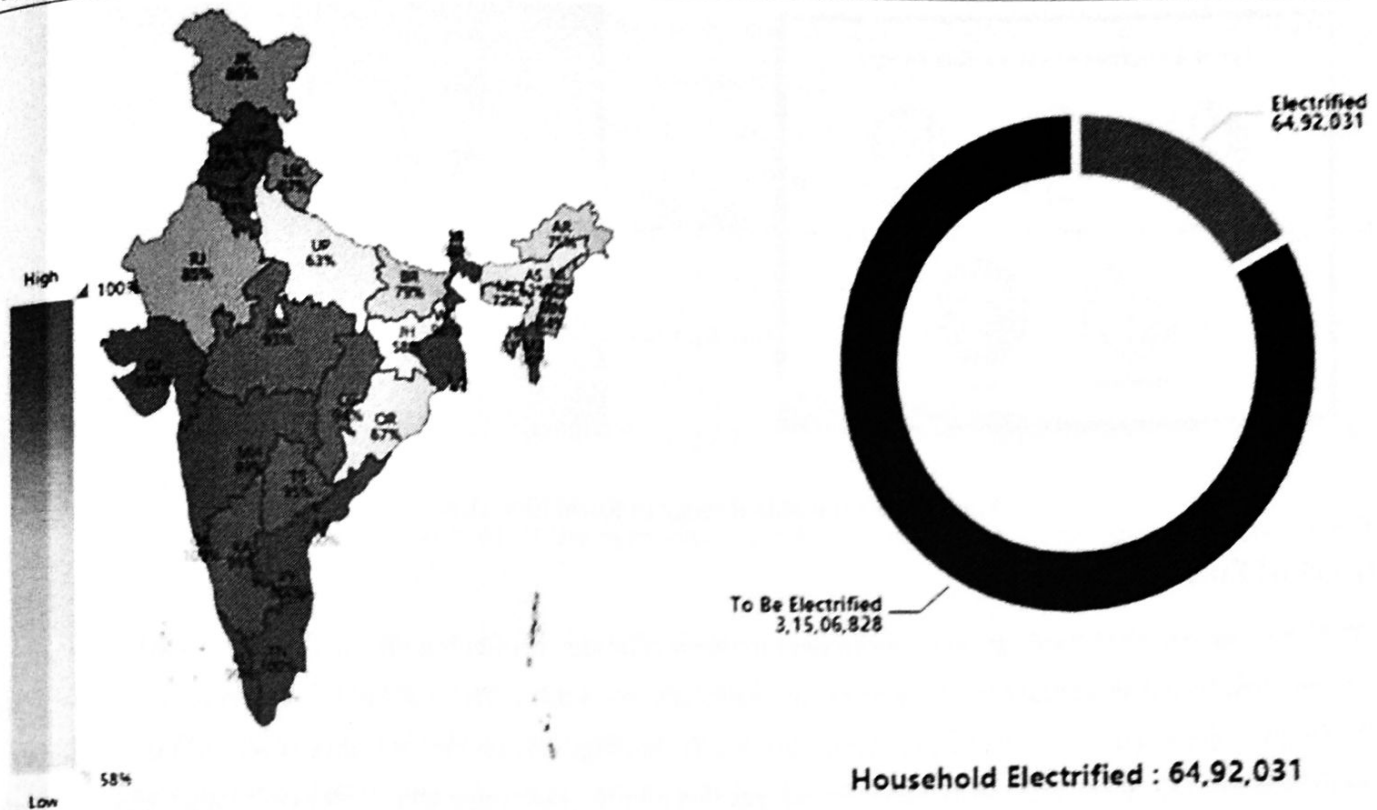


Figure 1: India's Current State of Rural Electrification [21]

## Renewable Energy Torural Electrification

The development of renewable energy sources such as solar energy, micro hydro, biomass power, mini-grids, smart micro-grids, and pico-grids has opened up new avenues for rural electrification [9]. These function as distributed power resources in rural areas with widely dispersed populations and are compatible with the main grid or its extension [10]. The battery power storage has improved flexibility, allowing it to keep power as needed to meet peak power demand [11]. Globally, the off-grid renewable energy sector is steadily growing as a result of advances in increased storage capacity [12]. Indian Institute of Technology (IIT) Hyderabad is creating dual carbon-alternative lithium-ion batteries in India. The United Nations (UN) has recognized the need for accessible power to generate value and help eradicate poverty through the Sustainable Development Goals (SDGs) [13]. Energy security and local employment are produced as a result of the power generation from local resources, which supports the local economy. Since the generated energy is locally produced and used, it has fewer Transmission and Distribution (T&D) losses. It is also sustainable and pollution-free. In making incremental ecosystems, rural electrification business strategies (if they are separate from the main grid) are necessary intended to increase rural income. Contrarily, given the circumstances in which they generate clean energy with zero carbon emissions, rural power generators continue the company's progress, sustainability, and profitability [14,15]. In some distant areas, using diesel generation to power off-grid telecom towers might be logistically expensive and time-consuming. Solar energy and energy storage, on the other hand, reduce the cost of extending communications networks in rural areas and give underserved communities access to the Internet and mobile phones. With more access, emerging markets have a viable alternative to depending primarily on demographic variables like population growth or the availability of natural resources to increase productivity and spread prosperity. Additionally, it provides established businesses with a chance to connect with new demographics and potential clients [16].



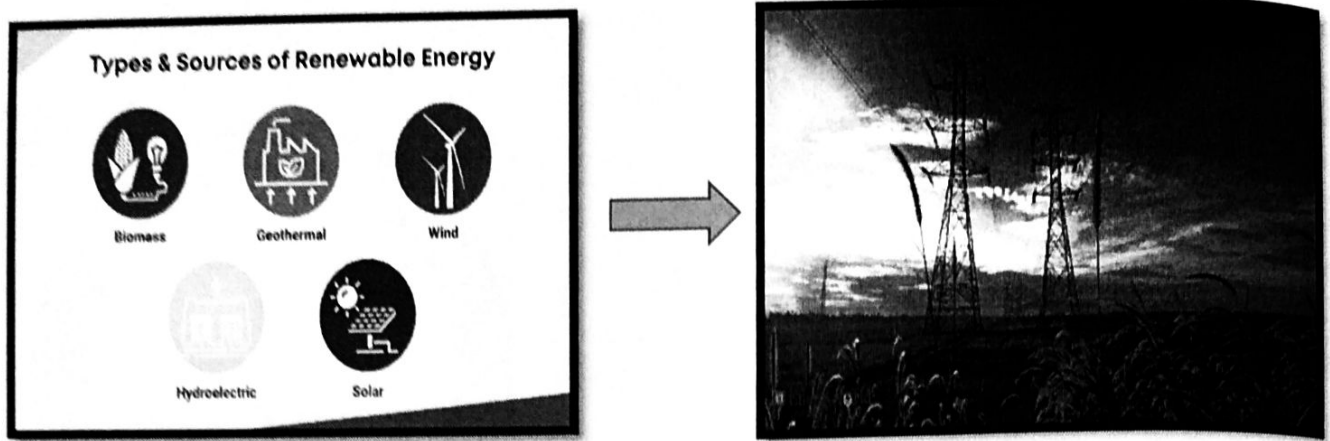


Figure 2: Renewable Energy to Rural Electrification

## Impact of Entrepreneurs

The new movement towards greener, more sustainable technology is opening up a lot of chances for those with an entrepreneurial mindset because we use energy for practically everything. The truth of limiting resources is becoming increasingly apparent as the world's population grows. Technology advancements have made it possible for us to access resources that were previously unreachable, yet this merely postpones what will eventually happen. Building your own wind farm or hydroelectric dam is not a requirement for becoming an entrepreneur in the renewable energy sector. There are other aspects of renewable energy besides only producing electricity, distribution, conservation, and storage are further considerations [17]. Now-a-days there are various start-ups generating energy storage technology for a variety of purposes. Some of them are *Advano*, *Enpower*, *Nanotech Energy*, *Northvolt*, *Quatumscape*, *Ion storage systems*. Alexander Girau, Shiva Adireddy, Adrian Yao, Eric Wachsman, Greg Hitz, Venkataraman Thangadurai, Dr Jack Kavanaugh developing energy storage technologies with the help of a wide range of investors and for a variety of applications [18]. We need to look at entrepreneurship from a broad range of perspectives to have a firm understand of the relevance of this significant phenomenon [22]. The following four key concepts aids to become entrepreneur: (1) creating value for both business and society; (2) setting long-term goals for improvement; (3) connecting business excellence and environmental excellence together; and (4) promoting sustainable consumption as well as sustainable production [23]. The most frequent obstacles restricting the entrepreneurship of renewable energy in developing nations include poor access to institutional finance, relatively high costs, a lack of skilled labour, a lack of physical infrastructure, a lack of adequate government or policy support, and the presence and influence of incumbents [20].

## Conclusion

Rural electrification and entrepreneurship are mutually beneficial. In contrast to electrification, which has a synergistic effect on increasing entrepreneurial prospects and entrepreneurial outcomes, rural electricity entrepreneurship can offer inexpensive rural electrification with the involvement of local resources [19]. However, their ideas need to be supported by many inputs like training, connecting to financial institutions, and providing information. Rural people also have a great deal of potential to adopt new ideas.

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