



ISSN: 0975-833X

## REVIEW ARTICLE

### SOLAR RURAL ELECTRIFICATION IN INDIA

<sup>1</sup>Avneet Pal Singh Khosa, <sup>2,\*</sup>Anand Chopra and <sup>3</sup>Karmandeep Singh Brar

<sup>1,3</sup>Department of Electrical Engineering, GZS-PTU Campus, Bathinda (Pb), India

<sup>2</sup>Department of Computer Science and Engineering, GZS-PTU Campus, Bathinda (Pb), India

#### ARTICLE INFO

##### Article History:

Received 15<sup>th</sup> December, 2014

Received in revised form

20<sup>th</sup> December, 2014

Accepted 05<sup>th</sup> January, 2015

Published online 28<sup>th</sup> February, 2015

##### Key words:

Electrification, IEA, Photovoltaic,  
Renewable Energy.

#### ABSTRACT

The Present study shows that the solar home lightening system in the remote village can influence the life of people very significantly for the better. The paper addresses the solar rural electrification in India. Although most of the developing countries have initiated rural electrification programs, progress has often been slow. The IEA estimates that developing and transition countries needs investment requirements in their energy sectors of US \$ 9.6 Trillion in period of 2001 to 2030. Renewable energy in India achieves potential of 12.95% by 2014 and is expected to grow further.

Copyright © 2015 Avneet Pal Singh Khosa et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

#### INTRODUCTION

Rural Electrification is the process of bringing electrical power to rural and remote areas. Electricity is not only used for lighting purposes and house holds but also for many farming operations. Around 25000 villages are located in remote inaccessible areas and hence could not be electrified through conventional grid extension in India. India was 43% electrified in 1990 as compared to 75% in 2012. Electricity is one of the prerequisites for significant sustainable economic growth of rural areas. There exists a wide variety of renewable resources and solar energy is one such. These techniques are relatively cheaper, environment friendly and easy to operate and manage by local people. Electricity is fundamental factor for significantly improving the lives of people in a relatively shorter period of time. Rural energy systems bring positive benefits such as better light, increased income, better education, better health to people. Access to electricity also encourages them to participate in productive and income generating activities which can help improve their own and their families livelihood.

#### Status of solar energy

As we know Sun is free and abundant source of energy and also its potential is high in India. The atmospheric environment is potentially an infinite and sustainable source of energy for human needs.

\*Corresponding author: Anand Chopra,  
Department of Computer Science and Engineering GZS-PTU Campus,  
Bathinda (Pb), India.

The sun is provided with much more energy than needed to meet the energy demands on Earth. Solar radiation is the fuel for solar energy on earth. Solar energy is utilized by two different methods first one by solar thermal process and other is by solar photovoltaic method. In first process we use sun's heat for various household applications like cooking etc. and in second solar photovoltaic process sun's heat is utilized to produce electricity.

#### Benefits of solar energy

- In undeveloped areas small amounts of electricity can free large amounts of human time and labour.
- Refrigerators increase the length of time that food can be stored and potentially reducing hunger.
- Supports National Energy Independence because solar energy is used where it is generated.
- Solar plants do not have any polluting emissions, do not make any sound and are not considered to be an eyesore.

#### Rural electrification status in India

- Number of states and union territories that have rural electrification rates 100% are 15.
- Number of states and union territories that have 99% electrification are only 4, which includes Gujarat with electrification of 99.8% but still has unelectrified 35 villages and other states which fall in this category include Maharashtra, West Bengal and Himachal Pradesh.

- Number of states and UTs that have rural electrification rates of +95% include Assam, Chattisgarh, Madhya Pradesh, Jammu and Kashmir, Tripura and Uttar Pradesh.
- Bihar, Mizoram, Jharkhand, Rajasthan and Nagaland have rural electrification rates of +90%.
- Odisha and Manipur have electrification rates of +80% whereas Andaman and Nicobar, Arunachal Pradesh and Meghalaya have rates below 80%.

### Conclusion

In recent decades, Human has realized the necessity of development of clean renewable energy resources. The arrival of electricity will significantly improve health conditions, especially for women and children and enables school children to study in evenings. Indeed from any economic perspective non conventional forms of rural electrification may least-cost, particularly where villages are some distance from existing grid. Power generation through renewable solar energy resources is economical and useful for rural areas, also it reduces the stress on fast depleting fossil fuels of energy for production of electricity. One of the least inexpensive, more reliable and best proven electricity distribution system for rural electrification is single wire earth return.

### REFERENCES

- Dr. Buragohaion T. "Impact of Solar Energy in Rural Development in India", *International Journal Of Environmental Science And Development*, Vol (3).
- Kadar P. "Pros and Cons Of Renewable Energy", *Acta Polytechnica Hungarica*, Vol(2).
- Mondal M. and Mondal S. "Remote village electrification through renewable Solar Energy", *International Journal Of Engineering and Science*, Vol (2).
- Solar Energy For Rural Electricity In India.  
The Alliance For Rural Electrification.  
World Energy Outlook, 2011.

\*\*\*\*\*