Renewable and Sustainable Energy Reviews 60 (2016) 1168–1184

Contents lists available at ScienceDirect

Renewable and Sustainable Energy Reviews

journal homepage: www.elsevier.com/locate/rser

Role of smart grid in renewable energy: An overview

M.S. Hossain [a], N.A. Madlool [b,*], N.A. Rahim [a], J. Selvaraj [a,*], A.K. Pandey [a], Abdul Faheem Khan [a]

[a] Centre of Research UMPEDAC, Level 4, Wisma R&D, University of Malaya, 59990 Kuala Lumpur, Malaysia
[b] Department of Mechanical Engineering, Faculty of Engineering, University of Kufa, 21 Kufa, Najaf, Iraq

ARTICLE INFO

Article history:
Received 28 August 2014
Received in revised form
31 May 2015
Accepted 18 September 2015
Available online 27 February 2016

Keywords:
Renewable energy
Smart grid system
Renewable power
Energy

ABSTRACT

Smart grid engineering is the key for a beneficial use of widespread energy resources, it is a modernized electrical grid that uses analog or digital information and communications technology. Renewable energy itself a thrust area of research due to its availability, applicability and environmental friendly nature and the application of smart grid in renewable energy makes it vast and more promising. This fusion enables the efficient use of renewable energies which is a key challenge for now. The present review paper attempts to investigate the role of smart grid in the renewable energy. The introductory section sets the role of renewable energy and distributed power in a smart grid system. Subsections cover the concept and availability of renewable energies, renewable energy power calculation formulae, smart grid concepts and its feasibility, case studied as performed by different researchers around the World, discussion and future recommendations and finally the conclusions from the study. To achieve this, articles from different sources such as internet, reports, conferences and journals of Elsevier, Springer, Tailor and Franacis, Wiley and many more have been collected and reviewed. This paper concludes that renewable energies can be used efficiently and in a smart way by using the smart grids. However, the smart grid technology is not mature enough and needs more research on the same.

Contents

* Corresponding authors.
E-mail addresses: naseer.alkhalidi@uokufa.edu.iq (N.A. Madlool), jeyraj@um.edu.my (J. Selvaraj), adarsh@um.edu.my (A.K. Pandey).

http://dx.doi.org/10.1016/j.rser.2015.09.098
1364-0321/