

## **An Evaluation of Renewable Energy Sources in Green Building Systems for the Residential Sector in the Metropolis, Kolkata, India**

**Authors :** Tirthankar Chakraborty, Indranil Mukherjee

**Abstract :** The environmental aspect had a major effect on industrial decisions after the deteriorating condition of our surroundings since the industrial activities became apparent. Green buildings have been seen as a possible solution to reduce the carbon emissions from construction projects and the housing industry in general. Though this has been established in several areas, with many commercial buildings being designed green, the scope for expansion is still significant and further information on the importance and advantages of green buildings is necessary. Several commercial green building projects have come up and the green buildings are mainly implemented in the residential sector when the residential projects are constructed to furnish amenities to a large population. But, residential buildings, even those of medium sizes, can be designed to incorporate elements of sustainable design. In this context, this paper attempts to give a theoretical appraisal of the use of renewable energy systems in residential buildings of different sizes considering the weather conditions (solar insolation and wind speed) of the metropolis, Kolkata, India. Three cases are taken; one with solar power, one with wind power and one with a combination of the two. All the cases are considered in conjunction with conventional energy, and the efficiency of each in fulfilling the total energy demand is verified. The optimum combination for reducing the carbon footprint of the residential building is thus established. In addition, an assessment of the amount of money saved due to green buildings in metered water supply and price of coal is also mentioned.

**Keywords :** renewable energy, green buildings, solar power, wind power, energy hybridization, residential sector

**Conference Title :** ICEED 2014 : International Conference on Energy, Environment and Development

**Conference Location :** Singapore, Singapore

**Conference Dates :** July 05-06, 2014