

# **HANDBOOK ON ENERGY CONSCIOUS BUILDINGS**

**Prepared under the interactive R & D project no. 3/4(03)/99-SEC  
between  
Indian Institute of Technology, Bombay  
and  
Solar Energy Centre, Ministry of Non-conventional Energy Sources**

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Pilot Edition: May 2006

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## Preface

The global energy scenario has undergone a drastic change in the last two decades. Due to ever growing demand and shortage of supply, the cost of fossil fuel (coal, oil and natural gas) is increasing day by day. Increasing consumption has led to environmental pollution resulting in global warming and ozone layer depletion. Consequently, the era of fossil fuel is gradually coming to an end and the attention is focused on the conservation of energy and search for renewable sources of energy, which are environmentally benign.

Buildings are major consumers of energy insofar as their construction, operation and maintenance are concerned. Though this is not very well quantified in India, yet there is ample scope for energy savings. The indoor environments are becoming increasingly important for human comfort and from health point of view. It is estimated that almost 50% of the global energy demand is due to buildings. Thus, the energy conscious architecture has evolved to address these issues. It involves the use of eco-friendly and less energy intensive building materials, incorporation of passive solar principles in building design and operation including daylighting features, integration of renewable energy technologies, conservation of water, waste water recycling, rainfall harvesting and use of energy-efficient appliances in buildings.

In spite of access to a large information base on various features and techniques, and despite pioneering work in this field by architects the world over and in India, the energy conscious design approach is not very widespread. The expertise developed at various Indian institutes has not percolated to architects at large, especially in a form that can directly be implemented in their designs. This book is an effort to orient the thinking of practising architects towards the importance and benefits of energy conscious architecture. The book provides information on basic principles, climatic conditions of India, passive solar approaches, general recommendations, specific guidelines and integration of renewable technologies in buildings. It contains a number of illustrations, working drawings, examples, case studies and references. In addition to practicing architects, it will also be a useful reference book for students of architectural and building scientists. Those who are conversant with the basic aspects of climate and passive solar architecture may skip Chapter 2 and 3 and refer to Chapter 5 for guidelines.

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