

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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May 2006

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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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ACKNOWLEDGEMENTS

The authors are grateful to a large group of people who have helped in many ways for completing the book. The Solar Energy Centre (SEC) of the Ministry of Non-conventional Energy Sources (MNES), Government of India has been engaged in providing technical consultancy on the use of energy efficient concepts in buildings. We are grateful to the SEC for initiating and sponsoring this work. We are grateful to Dr. T.C. Tripathi and Dr. N.P. Singh, who in their capacity of Advisor and Head of SEC have provided us constructive comments on the contents of the work. We are especially grateful to Dr. B. Bandyopadhyay, the current Advisor and Head of SEC and to his colleagues, not only for extending suggestions, but also for providing useful materials and information on “new glazings” and government initiatives, undertaken by various State Governments. We are grateful to Prof. K.R. Rao and Prof. N.K. Bansal, the reviewers of this project work. Our special thanks are due to Prof. Rao for going through the draft in a very detailed fashion and providing us valuable suggestions for improving the contents.

On a personal basis, we had solicited opinions from a number of experts and professionals. We have sought opinions and suggestions on the “Table of Contents” of the book from Prof. N.K. Bansal, Prof. U.N. Gaitonde, Prof. C.L. Gupta, Prof. R. Hazra, Mr. Anil Misra, Prof. K.R. Rao, Prof. R.L. Sawhney, Prof. M.S. Sodha, Prof. S.P. Sukhatme, Prof. G.N. Tiwari, Mr. Pankaj Agarwal and architects Sabu Francis, Vinod Gupta, Uttam Jain, Sen Kapadia, Prof. S. Kolhatkar, Prof. Rajiv Mishra, Sanjay Mhatre, D.G. Parab and Sanjay Prakash. Some of them attended a discussion meeting to finalise the contents of the book. Besides, a few of them had gone through the draft copy of the book and provided us various suggestions and comments. A book of this kind could not have become meaningful without their feedback. We are grateful to them for their valuable comments.

Prof. R.L. Sawhney and Dr. Mahendra Joshi, D.A.V. Indore have, not only made some specific calculations on earth-air pipe cooling system, but also have drafted the appropriate text for that section. We are sincerely grateful to both of them. Dr. Ashvini Kumar, Director, MNES has carried out calculations on roof surface evaporative cooling for the book. Besides, we have received many valuable inputs from him throughout the writing of the handbook. We are grateful to him.

The authors grateful to the Director and Dean (R & D) of IIT Bombay for providing infrastructural help. We appreciate the contributions of young students (Ayush, Chetan, Aman and Shashikant) of IIT Bombay, who helped us on collecting relevant materials and information. We are also grateful to the staff and students of Energy Systems Engineering of IIT Bombay for their kind support. Special thanks to Pravin for preparing the text and Vinayaka for tables and figures. We are indebted to the authors and editors of all books, journals, standards, etc. that we have referred to. We are grateful to Ms. Prema Prakash for going through the manuscript in minute details and painstakingly correcting the text, tables, figures, etc. We are thankful to Mr. Yogesh Nayak, Vimal Offset for taking enough care for printing the book.

Last but not the least, we are grateful to our family for bearing with us.

J.K. Nayak
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Handbook of Energy Efficiency in Buildings: A Life Cycle Approach offers a comprehensive and in-depth coverage of the subject with a further focus on the Life Cycle. The editors, renowned academics, invited a diverse group of researchers to develop original chapters for the book and managed to well integrate all contributions in a consistent volume. Sections cover the role of the building sector on energy consumption and greenhouse gas emissions, international technical standards, laws and regulations, building energy efficiency and zero energy consumption buildings, the life cycle assessment