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Xudong Zhao · Xiaoli Ma
Editors

Advanced Energy Efficiency Technologies for Solar Heating, Cooling and Power Generation

 Springer

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Preface

Overview

Based on the research experience and outcomes established by the authors, the proposed book will address a range of advanced energy efficiency technologies and their applications in solar heating, cooling and power generation, thus delivering the solutions to tackling the low efficiency problems remaining with the current systems.

In this book, the global solar resource will be briefly presented and the currently available solar systems will be illustrated. A number of advanced energy efficiency technologies, including heat pipes and loop heat pipes, PCM and PCM slurries, micro (mini)-channel panels, building integrate-able modular technologies, desiccant (adsorption and absorption) cycling, ejector cooling, heat pumps, as well as solar concentration and thermoelectric technologies will then be studied and characterised. Meanwhile, the applications of these technologies in various solar systems will be investigated. With the successful implementation of these advanced technologies, a few innovative solar systems applicable to rural and urban buildings are characterised. Based on the above analyses, the design principle and associated energy performance assessment method for these advanced solar systems will be delivered, while the associated economic and environmental performance analytic measures will also be discussed. In the end, a range of selected solar heating, cooling and power generation projects will be studied.

The proposed book will provide the readers with the latest technologies and methods that can significantly improving the performance of solar systems, thus enabling them to design, construct and apply high-performing solar systems in buildings and elsewhere. The publication of the book will promote wide deployment of advanced renewable solar technologies on the global scale.

The book will deliver a systematic introduction of the latest energy efficiency technologies and their applications in solar heating, cooling and power generation. By going through the dedicated illustration of the technologies, including heat pipes and loop heat pipes, PCM and PCM slurries, micro (mini)-channel panels, building

integrate-able modular technologies, desiccant/adsorption cycling, ejector cooling, heat pumps, as well as solar concentration and thermoelectric units, readers will be able to gain the knowledge of advanced solar energy technologies on a fast-track route. Through the study of the dedicated design method, energy and environmental performance, as well as the practical engineering cases, readers will be able to quickly grasp the sense on how to implement these innovative solar systems into practicality. The publication of the book will therefore promote wide deployment of advanced solar heating, cooling and power generation technologies in buildings and elsewhere at global extent.

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