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Descrizione fisica	1 online resource (301 pages)
Disciplina	697
Soggetti	Renewable energy sources Energy storage Thermodynamics Heat engineering Heat transfer Mass transfer Electric power production Energy policy Energy and state Renewable Energy Mechanical and Thermal Energy Storage Engineering Thermodynamics, Heat and Mass Transfer Mechanical Power Engineering Energy Policy, Economics and Management
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Geothermal Energy -- Heat Transfer Fundamentals and Building Loads -- Introduction to Heat Pumps -- Ground Heat Exchanger Modeling Outside the Borehole -- Ground Heat Exchanger Modeling Inside the Borehole -- Design of Secondary Loop Ground-Source Systems -- Pumping Energy -- Introduction to Commercial Buildings Applications -- Thermal Response Tests (TRT) -- Horizontal Ground Heat Exchanger -- Groundwater Ground Heat Exchangers -- Economic Analysis -- Advanced Topics in GSHP Analysis -- Appendix A: Heat Pump Performance Ratings -- Appendix B: DR-Nominal Sizes -- Appendix C:

Sommario/riassunto

Fundamentals of Geothermal Heat Pump Systems: Design and Application is written for upper-level undergraduate and graduate courses in renewable energy and heat transfer. This classroom-tested text covers ground heat exchanger modeling, secondary loop ground-source system design, pumping energy, thermal response testing, commercial building applications, and horizontal and groundwater ground heat exchangers. The book is oriented to practical applications, including the economic analysis of ground source heat pump (GSHP) systems, but more theoretical sections are provided covering research-related geothermal applications. Chapters on heat transfer fundamentals and heat pump concepts are included for readers less familiar with thermal engineering concepts. A chapter covering the economic analysis of GSHP systems is also included. All of the examples and problems in the book are solved using the open-source Python programming language. The book will provide students in geothermal energy courses with a solid understanding of the subject. It will also be a valuable reference for professionals working in the field of renewable energy. Introduces heat transfer fundamentals and heat pump concepts; Provides an economic analysis of GSHP systems; Includes design programs for GSHP sizing and software tools for loop loss estimation.
