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QRZR1G - JAYVON LAUREL

The internal heat of the planet Earth represents an inexhaustible reservoir of thermal energy known as Geothermal Energy. The 2nd edition of the book covers the geologic and technical aspects of developing all forms of currently available systems using this "renewable" green energy. The book presents the distribution and transport of thermal energy in the Earth. Geothermal Energy is a base load energy available at all times independent of climate and weather. The text treats the efficiency of diverse shallow near surface installations and deep geothermal systems including hydrothermal and petrothermal techniques and power plants in volcanic high-enthalpy fields. The book also discusses environmental aspects of utilizing different forms of geothermal energy, including induced seismicity, noise pollution and gas release to the atmosphere. Chapters on hydraulic well tests, chemistry of deep hot water, scale formation and corrosion, development of geothermal probes, well drilling techniques and geophysical exploration complete the text. This book, for the first time, covers the full range of utilization of Geothermal Energy.

Efficient Methods to Solve Complex Coupled Systems Coupled Systems: Theory, Models, and Applications in Engineering explains how to solve complicated coupled models in engineering using analytical and numerical methods. It presents splitting multiscale methods to solve multiscale and multiphysics problems and describes analytical and numerical methods in time and space for evolution equations arising in engineering problems. The book discusses the effectiveness, simplicity, stability, and consistency of the methods in solving problems that occur in real-life engineering tasks. It shows how MATLAB® and Simulink® are used to implement the methods. The author also covers the coupling of separate, multiple, and logical scales in applications, including microscale, macroscale, multiscale, and multiphysics problems. Covering mathematical, algorithmic, and practical aspects, this book brings together innovative ideas in coupled systems and extends standard engineering tools to coupled models in materials and flow problems with respect to their scale dependencies and their influence on each time and spatial scale.

An In-Depth Introduction to Geothermal Energy Addressing significant changes in the energy markets since the first edition, Geothermal Energy: Renewable Energy and the Environment, Second Edition expounds on the geothermal industry, exploring the expansion, growth, and development of geothermal systems. This text covers every area of geothermal energy, including environmental and economic issues, and technological advancements. Considers the Vast Technological Achievements within the Geothermal Industry Factoring in new concepts for distributed generation, hybrid technologies, and the development of Enhanced Geothermal Systems (EGS), the book incorporates real-world examples designed to illustrate the key aspects of chapter topics. It provides case studies in nearly every chapter, and includes examples from the U.S., Iceland, France, and Japan. Contains comprehensive, quantitative, and rigorous treatment of the geology, geochemistry, and geophysics of geothermal resources, and how they impact exploration, resource assessment, and operations Provides a state-of-the-art description of current Enhanced Geothermal Systems (EGS) Presents an objective description of the most recent economic comparisons including all energy resources Covers environmental issues of energy use and quantitative descriptions of the relative impacts of all renewable and non-renewable energy resources Describes geothermal resources from a global perspective, including direct use and geothermal heat pump applications, as well as power production Geothermal Energy: Renewable Energy and the Environment, Second Edition can be used for undergraduate coursework; as a reference for designers, planners, engineers, and architects; and as a source of background material for policymakers, investors, and regulators.

Geothermal energy has become a focal point of the renewable energy revolution. Both shallow and deep types of geothermal energy have the potential to offset carbon emissions, reduce energy costs, and stimulate the economy. Before widespread geothermal exploration and exploitation can occur, both shallow and deep technologies require improvement by theoretical and experimental investigations. This thesis investigated one aspect of both shallow and deep geothermal energy technologies. First, a group of shallow geothermal energy piles was modeled numerically. The model was constructed, calibrated, and validated using available data collected from full-scale in-situ experimental energy piles. Following calibration, the model was parameterized to demonstrate the impact of construction specifications on energy pile performance and cross-sectional thermal stress distribution. The model confirmed the role of evenly spaced heat exchangers in optimal pile performance. Second, experimental methods were used to demonstrate the evolution of a fractured granite permeability as a function of mineral dissolution. Steady-state flow-through experiments were performed on artificially fractured granite cores constrained by 5 MPa pore pressure, 30 MPa confining pressure, and a 120 degrees Celsius temperature. Upstream pore pressures, effluent mineral concentrations, and X-Ray tomography confirmed the hypothesis that fracture asperities dissolve during the flow through experiment, resulting in fracture closure.

This book is the outcome of more than a decade of research and technical development activities at Spain’s Geological Survey (IGME) concerning shallow geothermal energy, which were pursued in collaboration with other public bodies and European entities. It presents a compilation of papers on the theoretical foundations of, and practical aspects needed to understand the thermal regime of the topmost subsoil, up to 400 m deep, and the exceptional properties that this underground environment offers, which make it the ideal thermal reservoir for heating, ventilation, and air conditioning (HVAC). In the book’s first section, the basic theory of thermodynamics as applied to shallow geothermal energy, heat transfer and fluid mechanics in the geological porous medium is developed. The nature of the subsoil’s thermal regime in general and in the urban environment in particular is described. The second section introduces readers to the fundamental aspects of thermal installations equipped with geothermal heat pumps, describes the types of geothermal exchangers most commonly used, and reviews the techniques used to obtain the thermal parameters of the terrain. It also discusses the potential environmental impacts of shallow geothermal activity and corresponding management strategies, as well as the legal aspects of its regulation for the governance of shallow geothermal resources in the EU in general and Spain in particular. In closing, the book highlights examples of the methodologies’ applications, developed by IGME in the city of Zaragoza and the Canary Islands. The theoretical foundations, systematics and concrete applications make the book a valuable reference source for hydrogeologists, engineers and specialized technicians alike.

This is a collection of original papers, each by an expert in his field. They deal with different sectors of recent geophysical development. It may be, at first, difficult to see what else unites them, and how these several technologies can contribute to an integrated exploration process. What brings these writers together is that they have all contributed to the improvement of what comes to the eye of the geophysical interpreter. Some of the improvement is achieved at the data-gathering stage, some of it in processing, and in presentation. For all of this improvement interpreters in general are most grateful. The editor is appreciative in a quite personal way, not only of the advances in technology, but also of the effort in writing which has been made by these busy contributors, and so created this collection. Something can be said here about interpretation and the environment in which it is carried out, since it represents the field where the results of these technical developments are ultimately tested. In the commercial world it is from the geophysical interpreter that management learns the results of a large sector of exploration expenditure, and learns them in a form on which still larger expenditures on later phases of exploration can be based.

A modern and unique perspective on solar and geothermaltechnologies for heating and cooling buildings This book will have a broad appeal reaching practising engineersin the industry as well as students. With introductory sections foreach technology described, material includes chapters on:-geothermal energy use for the heating and cooling of buildings; achapter on electrically driven heat pumps/chillers; material onnight radiative cooling, photovoltaic thermal collectors,temperature modelling and thin film photovoltaicmodelling. Includes general introductory sections for each technology withmarket potential and applications Covers an increasingly important component of energycourses Considers a broad range of alternative renewable energysupplies relevant to the building sector, such as geothermal energywith heat pump With a special focus on solar cooling, provides detailedphysical models of all technologies and example calculations Unique in covering the fundamentals of meteorologicalmodelling

Geothermal Energy: Sustainable Heating and Cooling Using the Ground Marc A. Rosen and Seama Koohi-Fayegh, University of Ontario Institute of Technology, Canada Comprehensively covers geothermal energy systems that utilize ground energy in conjunction with heat pumps to provide sustainable heating and cooling The book describes geothermal energy systems that utilize ground energy in conjunction with heat pumps and related technologies to provide heating and cooling. Also discussed are methods to model and assess such systems, as well as means to determine potential environmental impacts of geothermal energy systems and their thermal interaction. The book presents the most up-to-date information in the area. It provides material on a range of topics, from thermodynamic concepts to more advanced discussions of the renewability and sustainability of geothermal energy systems. Numerous applications of such systems are also provided. Geothermal Energy: Sustainable Heating and Cooling Using the Ground takes a research orientated approach to provide coverage of the state of the art and emerging trends, and includes numerous illustrative examples and case studies. Theory and analysis are emphasized throughout, with detailed descriptions of models available for vertical and horizontal geothermal heat exchangers. Key features: Explains geothermal energy systems that utilize ground energy in conjunction with heat pumps to provide heating and cooling, as well as related technologies such as thermal energy storage. Describes and discusses methods to model and analyze geothermal energy systems, and to determine their potential environmental impacts and thermal interactions. Covers various applications of geothermal energy systems. Takes a research orientated approach to provide coverage of the state of the art and emerging trends. Includes numerous illustrative examples and case studies. The book is key for researchers and practitioners working in geothermal energy, as well as graduate and advanced undergraduate students in departments of mechanical, civil, chemical, energy, environmental, process and industrial engineering.

Among the most important and exciting current steps forward in geo-engineering is the development of coupled numerical models. They represent the basic physics of geo-engineering processes which can include the effects of heat, water, mechanics and chemistry. Such models provide an integrating focus for the wide range of geo-engineering disciplines. The articles within this volume were originally presented at the inaugural GeoProc conference held in Stockholm and contain a collection of unusually high quality information not available elsewhere in an edited and coherent form. This collection not only benefits from the latest theoretical developments but also applies them to a number of practical and wide ranging applications. Examples include the environmental issues around radioactive waste disposal deep in rock, and the search for new reserves of oil and gas.

The superior goal of the gebo research association was making important contributions for the future reliable drilling under the existing “hot-hard-rock” conditions in Niedersachsen and their development to the geothermal drillings with sustainable geological subsurface heat exchangers. This goal should be achieved due to the solid research and innovative technology approaches in their combination within one concept for pioneering methods in deep geothermal drillings in hard rock, to be more exact - in interdisciplinary cooperation on engineers and scientists - in cooperation between industry and University, researchers and users Gebo research association comprised scientists and technicians of different research institutions and universities who are working in 33 projects. The individual projects were assigned to one of the 4 main research fields or focus areas. Gebo research association started its activities with 7 project partners participating: - Technische Uni-

versität Braunschweig (TUBS) - Technische Universität Clausthal (TUC) - Gottfried Wilhelm Leibniz Universität Hannover (LUH) - Georg-August-Universität Göttingen (UGOE) - Leibniz-Institut für Angewandte Geophysik (LIAG) - Bundesanstalt für Geowissenschaften und Rohstoffe (BGR) - Energie--Forschungszentrum Niedersachsen (EFZN) Baker Hughes, an industrial partner, participated in the association and supplies it with its experience and additional funds.

A comprehensive reference to renewable energy technologies with a focus on power generation and integration into power systems This book addresses the generation of energy (primarily electrical) through various renewable sources. It discusses solar and wind power—two major resources that are now in use in small as well as large-scale power production—and their requirements for effectively using advanced control techniques.In addition, the book looks at theintegration of renewable energy in the power grid and its ability to work in a micro grid. Operation and Control of Renewable Energy Systems describes the numerous types of renewable energy sources available and the basic principles involving energy conversion, including the theory of fluid mechanics and the laws of thermodynamics. Chapter coverage includes the theory of power electronics and various electric power generators, grid scale energy storage systems, photovoltaic power generation, solar thermal energy conversion technology, horizontal and vertical wind turbines for power generation, and more. Covers integration into power systems with an emphasis on microgrids Introduces a wide range of subjects related to renewable energy systems, including energy storage, microgrids, and battery technologies Includes tutorial materials such as up-to-date references for wind energy, grid connection, and power electronics—plus worked examples and solutions Operation and Control of Renewable Energy Systems is the perfect introduction to renewable energy technologies for undergraduate and graduate students and can also be very useful to practicing engineers.

Geothermal energy for electricity generation is an appealing solution to reducing greenhouse gas emissions produced by fossil fuels. As such, this book presents a comprehensive overview of the research related to and the potential applications of geothermal energy. Chapters cover such topics as power technology using low-temperature geothermal energy resources, current world status of geothermal resource utilization, low-temperature district heating systems, and much more.

As nations alike struggle to diversify and secure their power portfolios, geothermal energy, the essentially limitless heat emanating from the earth itself, is being harnessed at an unprecedented rate. For the last 25 years, engineers around the world tasked with taming this raw power have used Geothermal Reservoir Engineering as both a training manual and a professional reference. This long-awaited second edition of Geothermal Reservoir Engineering is a practical guide to the issues and tasks geothermal engineers encounter in the course of their daily jobs. The book focuses particularly on the evaluation of potential sites and provides detailed guidance on the field management of the power plants built on them. With over 100 pages of new material informed by the breakthroughs of the last 25 years, Geothermal Reservoir Engineering remains the only training tool and professional reference dedicated to advising both new and experienced geothermal reservoir engineers. The only resource available to help geothermal professionals make smart choices in field site selection and reservoir management Practical focus eschews theory and basics- getting right to the heart of the important issues encountered in the field Updates include coverage of advances in EGS (enhanced geothermal systems), well stimulation, well modeling, extensive field histories and preparing data for reservoir simulation Case studies provide cautionary tales and best practices that can only be imparted by a seasoned expert

Rising pollution, climate change and the depletion of fossil fuels are leading many countries to focus on renewable-based energy conversion systems. In particular, recently introduced energy policies are giving high priority to increasing the use of renewable energy sources, the improvement of energy systems' security, the minimization of greenhouse gas effect, and social and economic cohesion. Renewable energies' availability varies during the day and the seasons and so their use must be accurately predicted in conjunction with the management strategies based on load shifting and energy storage. Thus, in order to reduce the criticalities of this uncertainty, the exploitation of more flexible and stable renewable energies, such as the geothermal one, is necessary. Geothermal energy is an abundant renewable source with significant potential in direct use applications, such as in district heating systems, in indirect use ones to produce electricity, and in cogeneration and polygeneration systems for the combined production of power, heating, and cooling energy. This Special Issue includes geothermal energy utilization and the technologies used for its exploitation considering both the direct and indirect use applications.

The book presents a thorough overview of the latest trends and challenges in renewable energy technologies applications for water desalination, with an emphasis on environmental concerns and sustainable development. Emphasis is on the various uses of renewable energy, as well as economics & scale-up, government subsidies & regulations, and environmental concerns. It provides an indication on how renewable energy technologies are rapidly emerging with the promise of economic and environmental viability for desalination. Further it gives a clear indication on how exactly to accelerate the expansion and commercialization of novel water production systems powered by renewable energies and in what manner environmental concerns may be minimized. This book is all-inclusive and wide-ranging and directed at decision makers in government, industry and the academic world as well as students.

A unique approach to the study of geothermal energy systems This book takes a unique, holistic approach to the interdisciplinary study of geothermal energy systems, combining low, medium, and high temperature applications into a logical order. The emphasis is on the concept that all geothermal projects contain common elements of a "thermal energy reservoir" that must be properly designed and managed. The book is organized into four sections that examine geothermal systems: energy utilization from resource and site characterization; energy harnessing; energy conversion (heat pumps, direct uses, and heat engines); and energy distribution and uses. Examples are provided to highlight fundamental concepts, in addition to more complex system design and simulation. Key features: Companion website containing software tools for application of fundamental principles and solutions to real-world problems. Balance of theory, fundamental principles, and practical application. Interdisciplinary treatment of the subject matter. Geothermal Heat Pump & Heat Engine Systems: Theory and Practice is a unique textbook for Energy Engineering and Mechanical Engineering students as well as practicing engineers who are involved with low-enthalpy geothermal energy systems.

This final report describes the results of a research program we carried out over a five-year (3/1999-9/2004) period with funding from a Department of Energy geothermal FDP grant (DE-FG07-99ID13745) and from other agencies. The goal of research projects in this program were to develop modeling technologies that can increase the understanding of geothermal reservoir chemistry and chemistry-related energy production processes. The ability of computer models to handle many chemical variables and complex interactions makes them an essential tool for building a fundamental understanding of a wide variety of complex geothermal resource and production chemistry. With careful choice of methodology and parameterization, research objectives were to show that chemical models can correctly simulate behavior for the ranges of fluid compositions, formation minerals, temperature and pressure associated with present and near future geothermal systems as well as for the very high PT chemistry of deep resources that is intractable with traditional experimental methods. Our research results successfully met these objectives. We demonstrated that advances in physical chemistry theory can be used to accurately describe the thermodynamics of solid-liquid-gas systems via their free energies for wide ranges of composition (X), temperature and pressure. Eight articles on this work were published in peer-reviewed journals and in conference proceedings. Four are in preparation. Our work has been presented at many workshops and conferences. We also considerably improved our interactive web site (geotherm.ucsd.edu), which was in preliminary form prior to the grant. This site, which includes several model codes treating different XPT conditions, is an effective means to transfer our technologies and is used by the geothermal community and other researchers worldwide. Our models have wide application to many energy related and other important problems (e.g., scaling prediction in petroleum production systems, stripping towers for mineral production processes, nuclear waste storage, CO2 sequestration strategies, global warming). Although funding decreases cut short completion of several research activities, we made significant progress on these abbreviated projects.

This book is the outcome of more than a decade of research and technical development activities at Spains Geological Survey (IGME) concerning shallow geothermal energy, which were pursued in collaboration with other public bodies and European entities. It presents a compilation of papers on the theoretical foundations of, and practical aspects needed to understand the thermal regime of the topmost subsoil, up to 400 m deep, and the exceptional properties that this underground environment offers, which make it the ideal thermal reservoir for heating, ventilation, and air conditioning (HVAC). In the books first section, the basic theory of thermodynamics as applied to shallow geothermal energy, heat transfer and fluid mechanics in the geological porous medium is developed. The nature of the subsoils thermal regime in general and in the urban environment in particular is described. The second section introduces readers to the fundamental aspects of thermal installations equipped with geothermal heat pumps, describes the types of geothermal exchangers most commonly used, and reviews the techniques used to obtain the thermal parameters of the terrain. It also discusses the potential environmental impacts of shallow geothermal activity and corresponding management strategies, as well as the legal aspects of its regulation for the governance of shallow geothermal resources in the EU in general and Spain in particular. In closing, the book highlights examples of the methodologies applications, developed by IGME in the city of Zaragoza and the Canary Islands. The theoretical foundations, systematics and concrete applications make the book a valuable reference source for hydrogeologists, engineers and specialized technicians alike.

This book is dedicated to the numerical modeling of shallow geothermal systems. The utilization of shallow geothermal energy involves the integration of multiple Borehole Heat Exchangers (BHE) with Ground Source Heat Pump (GSHP) systems to provide heating and cooling. The modeling practices explained in this book can improve the efficiency of these increasingly common systems. The book begins by explaining the basic theory of heat transport processes in man-made as well as natural media. . These techniques are then applied to the simulation of borehole heat exchangers and their interaction with the surrounding soil. The numerical and analytical models are verified against analytical solutions and measured data from a Thermal Response Test, and finally, a real test site is analyzed through the model and discussed with regard to BHE and GSHP system design and optimization.

Type of Book: 2022 Edition - NTA UGC NET/JRF/SET Paper II (Geography) Subject – NTA UGC NET/JRF/SET (Geography Paper-2) Index - - Cover 28 Solved Papers December 2012 to 2021 - 1900+ Solved Questions with Answers for Practice Qualities Easy & Understandable for Preparation Complete syllabus accommodated with all the recent changes Based On Recently Updated Syllabus Latest Solved Papers Include

Flow and Heat Transfer in Geothermal Systems: Basic Equations for Description and Modeling Geothermal Phenomena and Technologies is the ideal reference for research in geothermal systems and alternative energy sources. Written for a wide variety of users, including geologists, geophysicists, hydro-geologists, and engineers, it offers a practical framework for the application of heat and flow transport theory. Authored by two of the world's foremost geothermal systems experts, whose combined careers span more than 50 years, this text is a one-stop resource for geothermal system theory and application. It will help geoscientists and engineers navigate the wealth of new research that has emerged on the topic in recent years. Presents a practical and immediately implementable framework for understanding and applying heat and flow transport theory Features equations for modelling geothermal phenomena and technologies in full detail Provides an ideal text for applications in both geophysics and engineering

The internal heat of the planet Earth represents an inexhaustible reservoir of thermal energy. This form of energy, known as geothermal energy has been utilized throughout human history in the form of hot water from hot springs. Modern utilization of geothermal energy includes direct use of the heat and its conversion to other forms of energy, mainly electricity. Geothermal energy is a form of renewable energy and its use is associated with very little or no CO2-emissions and its importance as an energy source has greatly increased as the effects of climate change become more prominent. Because of its inexhaustibility it is obvious that utilization of geothermal energy will become a cornerstone of future energy supplies. The exploration of geothermal resources has become an important topic of study as geology and earth science students prepare to meet the demands of a rapidly growing industry, which involves an increasing number professionals and public institutions participating in geothermal energy related projects. This book meets the demands of both groups of readers, students and professionals. Geothermal Energy and its utilization is systematically presented and contains the necessary technical information needed for developing and understanding geothermal energy projects. It presents basic knowledge on the Earth's thermal regime and its geothermal energy resources, the types of geothermal energy used as well as its future potential and the perspectives of the industry. Specific chapters of the book deal with borehole heat exchangers and with the direct use of groundwater and thermal water in hydrogeothermal systems. A central topic are Enhanced Geothermal Systems (hot-dry-rock systems), a key technology for energy supply in the near future. Pre-drilling site investigations, drilling technology, well logging and hydraulic test programs are important subjects related to the exploration phase of developing Geothermal Energy sites. The chemical composition of the natural waters used as a heat transport medium in geothermal systems can be used as an exploration tool, but chemistry is also important during operation of a geothermal power plant because of potential scale formation and corrosion of pipes and installations, which needs to be prevented. Graduate students and professio-

nals will find in depth information on Geothermal Energy, its exploration and utilization.
Geothermal Energy Systems provides design and analysis methodologies by using exergy and enhanced exergy tools (covering exergoenvironmental, exergoeconomic, exergetic life cycle assessment, etc.), environmental impact assessment models, and sustainability models and approaches. In addition to presenting newly developed advanced and integrated systems for multigenerational purposes, the book discusses newly developed environmental impact assessment and sustainability evaluation methods and methodologies. With case studies for integrated geothermal energy sources for multigenerational aims, engineers can design and develop new geothermal integrated systems for various applications and discover the main advantages of design choices, system analysis, assessment and development of advanced geothermal power systems. Explains the ability of geothermal energy power systems to decrease global warming Discusses sustainable development strategies for using geothermal energy sources Provides new design conditions for geothermal energy sources-based district energy systems
This introduction to geothermal modeling deals with flow and heat transport processes in porous and fractured media related to geothermal energy applications. Following background coverage of geothermal resources and utilization in several countries, the basics of continuum mechanics for heat transport processes, as well as numerical methods for solving underlying governing equations are discussed. This examination forms the theoretical basis for five included step-by-step OpenGeoSys exercises, highlighting the most important computational areas within geothermal resource utilization, including heat diffusion, heat advection in porous and fractured media, and heat convection. The book concludes with an outlook on practical follow-up contributions investigating the numerical simulation of shallow and deep geothermal systems.

Ron DiPippo, Professor Emeritus at the University of Massachusetts Dartmouth, is a world-regarded geothermal expert. This single resource covers all aspects of the utilization of geothermal energy for power generation from fundamental scientific and engineering principles. The thermodynamic basis for the design of geothermal power plants is at the heart of the book and readers are clearly guided on the process of designing and analysing the key types of geothermal energy conversion systems. Its practical emphasis is enhanced by the use of case studies from real plants that increase the reader's understanding of geothermal energy conversion and provide a unique compilation of hard-to-obtain data and experience. An important new chapter covers Environmental Impact and Abatement Technologies, including gaseous and solid emissions; water, noise and thermal pollutions; land usage; disturbance of natural hydrothermal manifestations, habitats and vegetation; minimisation of CO2 emissions and environmental impact assessment. The book is illustrated with over 240 photographs and drawings. Nine chapters include practice problems, with solutions, which enable the book to be used as a course text. Also includes a definitive worldwide compilation of every geothermal power plant that has operated, unit by unit, plus a concise primer on the applicable thermodynamics. * Engineering principles are at the heart of the book, with complete coverage of the thermodynamic basis for the design of geothermal power systems * Practical applications are backed up by an extensive selection of case studies that show how geothermal energy conversion systems have been designed, applied and exploited in practice * World renowned geothermal expert DiPippo has including a new chapter on Environmental Impact and Abatement Technology in this new edition
Geothermal Energy Systems The book encounters basic knowledge about geothermal technology for the utilization of geothermal resources. The book helps to understand the basic geology needed for the utilization of geothermal energy, shows up the practice to make access to geothermal reservoirs by drilling and the engineering of the reservoir by enhancing methods. The book describes the technology to make use of the Earth?s heat for direct use, power, and/or chill and gives boundary conditions for its economic and environmental utilization. A special focus is made on enhanced or engineered geothermal systems (EGS) which are based on concepts which bring a priori less productive reservoirs to an economic use. From the contents: Reservoir Definition Exploration Methods Drilling into Geothermal Reservoirs Enhancing Geothermal Reservoirs Geothermal Reservoir Simulation Energetic Use of EGS Reservoirs Economic Performance and Environmental Assessment Deployment of Enhanced Geothermal Systems plants and CO2-mitigation
Geothermal energy refers to the heat contained within the Earth that generates geological phenomena on a planetary scale. Today, this term is often associated with man's efforts to tap into this vast energy source. Geothermal Energy: utilization and technology is a detailed reference text, describing the various methods and technologies used to exploit the earth's heat. Beginning with an overview of geothermal energy and the state of the art, leading international experts in the field cover the main applications of geothermal energy, including: electricity generation space and district heating space cooling greenhouse heating aquaculture industrial applications The final third of the book focuses upon environmental impact and economic, financial and legal considerations, providing a comprehensive review of these topics. Each chapter is written by a different author, but to a set style, beginning with aims and objectives and ending with references, self-assessment questions and answers. Case studies are included throughout. Whilst written primarily for professionals and students interested in learning more about geothermal energy, the book also offers those new to the field and the general geothermal community an opportunity to understand and review the potential of this exciting alternative energy source. Published with UNESCO