

Preface

Geothermal energy is an inexhaustible source of thermal and electrical energy on a human time scale. Its utilization is friendly to the environment and supplies base-load energy. The energy source does not depend on weather, and the energy is supplied 24 h per day during 7 days a week. Utilization of geothermal energy increases the regional and local net product. It relieves dependence from fossil fuels and helps to conserve the valuable chemical resources for the future. Deep geothermal resources provide thermal and electrical (converted thermal) energy thus providing reliable energy for the future.

Utilization of deep geothermal resources extracts hot fluid from thermal reservoirs. These hot waters are reinjected to the reservoirs, thus maintaining the natural equilibrium and permitting a sustainable and sparing management of the resource. Geothermal installations and power plants are characterized by small land use. Visual impact on landscape is minimal (an aspect that is particularly critical in densely populated areas).

Electrical energy from geothermal resources can provide an important contribution to the base-load electrical energy supply and may replace large-scale power plants fired with fossil fuels.

The utilization of geothermal energy from shallow resources for the production of energy at low temperature for heating and cooling applications made tremendous progress in the past decade.

Geothermal energy from deep sources and reservoirs can contribute significant base-load energy. The necessary technology of Enhanced Geothermal Systems (EGS) can be installed nearly everywhere. However, the EGS technology needs further improvements and research. Successful demonstration projects would help to popularize EGS further.

Long-term concepts of energy politics integrate geothermal energy sources because it supplies base-load energy. Intelligent combination of geothermal systems with other sources of renewable energy can create sustainable synergy benefits. For residential homes, for example, combining ground source heat pump systems with solar thermal systems proved to be highly energy efficient. Geothermal power from a deep hydrothermal system can be combined with a biogas installation to improve energy efficiency.

This book aims to offer the reader a general overview over the many different aspects of utilization of geothermal energy. We are looking forward to the further rapid development of this fascinating source of energy in the years to come. We wish all of us a reliable, save, and environmentally friendly supply of thermal and electrical power. We hope to contribute to the sustainable use of energy with this book.

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Geothermal Energy

From Theoretical Models to Exploration and
Development

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2013, IX, 291 p. 120 illus., 69 illus. in color., Hardcover

ISBN: 978-3-642-13351-0