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Nota di contenuto	An Introduction to Thermogeology: Ground Source Heating and Cooling; Contents; About the Author; Preface to the First Edition; Preface to the Second Edition; Acknowledgements; 1: An Introduction; 1.1: Who should read this book?; 1.2: What will this book do and not do?; 1.3: Why should you read this book?; 1.4: Thermogeology and hydrogeology; 2: Geothermal Energy; 2.1: Geothermal energy and ground source heat; 2.2: Lord Kelvin's conducting, cooling earth; 2.3: Geothermal gradient, heat flux and the structure of the earth; 2.4: Internal heat generation in the crust; 2.5: The convecting earth? 2.6: Geothermal anomalies 2.7: Types of geothermal system; 2.8: Use of geothermal energy to produce electricity by steam turbines; 2.9: Binary systems; 2.10: Direct use; 2.11: Cascading use; 2.12: Hot dry rock systems [a.k.a. 'enhanced geothermal systems (EGS)']; 2.13: The 'sustainability' of geothermal energy and its environmental impact; 2.14: And if we do not live in Iceland?; 3: The Subsurface as a Heat Storage Reservoir; 3.1: Specific heat capacity: the ability to store heat; 3.2: Movement of heat; 3.3: The temperature of the ground; 3.4: Insolation and atmospheric radiation

3.5: Cyclical temperature signals in the ground 3.6: Geothermal gradient; 3.7: Human sources of heat in the ground; 3.8: Geochemical energy; 3.9: The heat energy budget of our subsurface reservoir; 3.10: Cyclical storage of heat; 3.11: Manipulating the ground heat reservoir; 4: What Is a Heat Pump?; 4.1: Engines; 4.2: Pumps; 4.3: Heat pumps; 4.4: The rude mechanics of the heat pump; 4.5: Absorption heat pumps; 4.6: Heat pumps for space heating; 4.7: The efficiency of heat pumps; 4.8: Air-sourced heat pumps; 4.9: Ground source heat pumps; 4.10: Seasonal performance factor (SPF) 4.11: GSHPs for cooling 4.12: Other environmental sources of heat; 4.13: The benefits of GSHP's; 4.14: Capital cost; 4.15: Other practical considerations; 4.16: The challenge of delivering efficient GSHP systems; 4.17: Challenges: the future; 4.18: Summary; 5: Heat Pumps and Thermogeology: A Brief History and International Perspective; 5.1: Refrigeration before the heat pump; 5.2: The overseas ice trade; 5.3: Artificial refrigeration: who invented the heat pump?; 5.4: The history of the GSHP; 5.5: The global energy budget: how significant are GSHP's? 5.6: Ground source heat: a competitor in energy markets?6: Ground Source Cooling; 6.1: Our cooling needs in space; 6.2: Scale effects and our cooling needs in time; 6.3: Traditional cooling; 6.4: Dry coolers; 6.5: Evaporation; 6.6: Chillers/heat pumps; 6.7: Absorption heat pumps; 6.8: Delivery of cooling in large buildings; 6.9: Dehumidification; 6.10: Passive cooling using the ground; 6.11: Active ground source cooling; 6.12: An example of open-loop groundwater cooling; 7: Options and Applications for Ground Source Heat Pumps; 7.1: How much heat do I need?; 7.2: Sizing a GSHP 7.3: Open-loop ground source heat systems

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## Sommario/riassunto

This authoritative guide provides a basis for understanding the emerging technology of ground source heating and cooling. It equips engineers, geologists, architects, planners and regulators with the fundamental skills needed to manipulate the ground's huge capacity to store, supply and receive heat, and to implement technologies (such as heat pumps) to exploit that capacity for space heating and cooling. The author has geared the book towards understanding ground source heating and cooling from the ground side (the geological aspects), rather than solely the building aspects. He explains t

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