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Autore	Lu Kathy
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Nota di contenuto	Materials in Energy Conversion, Harvesting, and Storage; Copyright; Contents; Preface; Acknowledgments; About the Author; Chapter 1 Energy Resources, Greenhouse Gases, and Materials; 1.1 Energy Supply and Consumption; 1.2 Energy Problems and Challenges; 1.3 Current State of Improving Energy Efficiency; 1.4 Inseparable Links between Energy and Materials; 1.5 Terms Related to Energy and Power; 1.6 Outline of This Book; References; Chapter 2 Fossil Energy and Materials; 2.1 Fossil Fuels; 2.2 Existing Coal-Fired Power Plants; 2.3 Materials for Existing Coal-Fired Power Plants 2.3.1 Material Issues 2.3.1.1 Fatigue and Creep; 2.3.1.2 Corrosion; 2.3.2 Material Development; 2.4 Integrated Gasification Combined Cycle Plants; 2.5 Materials for Integrated Gasification Combined Cycle Plants; 2.6 Oxy-Fuel Combustion Plants and Material Needs; 2.6.1 Oxy-fuel Combustion; 2.6.2 Material Needs; 2.6.3 Thermal Barrier Coatings; 2.6.3.1 Thermal Barrier Coating Compositions; 2.6.3.2 Thermal Barrier Coating Processing; 2.6.3.3 Thermal Barrier Coating Defects; 2.7 Materials in Oil and Gas Energy Conversion; 2.8 Carbon Capture and Storage; 2.8.1 Carbon Capture

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Sommario/riassunto

In the complex web of energy resource, production, storage, use, and efficiency, materials play a critical role as diverse and far-reaching as energy itself. In this book, the availability, accessibility, and affordability of different energy sources are discussed. Energy production processes as well as material uses and performance requirements in fossil, nuclear, solar, bio, wind, hydrothermal, geothermal, and ocean energy systems are addressed. Materials science issues in energy conversion systems are presented. In addition, energy harvesting and storage issues (including hydrogen storage
