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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

2.8.1.1 Carbon Capture Methods 2.8.1.2 Carbon Separation Methods;
2.8.2 Carbon Storage; 2.8.2.1 Carbon Storage in Geological Formations;
2.8.2.2 Carbon Storage in Ocean; 2.8.2.3 Carbon Storage Concerns; 2.9
Summary; References; Chapter 3 Nuclear Energy Conversion and
Materials; 3.1 State of Nuclear Energy; 3.2 Advantages and
Disadvantages of Nuclear Energy; 3.3 Nuclear Fission and Fusion; 3.4
Fission Process for Nuclear Energy Generation; 3.5 Two Different Fuel
Cycles; 3.6 Nuclear Fuel Supply; 3.6.1 Uranium and Plutonium; 3.6.2
Thorium; 3.7 Classification of Nuclear Fission Reactors
3.7.1 Generation Classification 3.7.2 Coolant-Based Classification; 3.8
Commercial Reactors; 3.9 Future Reactors; 3.10 Nuclear Materials;
3.10.1 Core Components; 3.10.1.1 Nuclear Fuels; 3.10.1.2 Cladding
Materials; 3.10.2 Out-of-Core Materials; 3.10.3 Balance-of-Plant
Materials; 3.11 Nuclear Waste Management; 3.11.1 Waste Types; 3.11.2
Waste Storage; 3.11.3 Geologic Disposal; 3.12 Fusion Reactors and
Material Issues; 3.12.1 Fusion Reactors; 3.12.2 Fusion Materials; 3.12.3
Fusion Wastes; 3.13 Summary; References; Chapter 4 Solar Energy and
Materials; 4.1 Solar Energy
4.2 Photovoltaic Cell Fundamentals 4.3 First-Generation Solar Cells; 4.4
Second-Generation Solar Cells; 4.4.1 Crystalline Silicon Thin-Film Cells;
4.4.2 Amorphous Silicon Thin-Film Cells; 4.4.3 CdTe and CuInGaSe₂
Thin-Film Cells; 4.5 Third-Generation Solar Cells; 4.5.1 Tandem and
Multijunction Cells; 4.5.2 Impurity- and Intermediate-Band Solar Cells;
4.5.3 Multiple Carrier and Hot Carrier Cells; 4.6 Dye-Sensitized Solar
Cells; 4.6.1 Working Principles; 4.6.2 Anode; 4.6.3 Counter Electrode;
4.6.4 Sensitizers; 4.6.5 Solid State Electrolytes; 4.7 Organic
Photovoltaics; 4.7.1 Working Principles
4.7.2 Differences between Conventional and Organic Solar Cells

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
