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Nota di contenuto	Algae: A New Biomass Resource -- Anaerobic Fermentation of Organic Material, Biological Processes and their Control Parameters -- Bio-Gtl Processes -- Bioenergy within Global Energy Systems -- Current and Future Contribution -- Bioenergy: Role in Balancing the Electricity Grid and as Energy Storage -- Bioethanol from Lignocellulosic Biomass -- Bioethanol from Starch: The US Experience -- Bioethanol from Sugar and Starch -- Bioethanol from Sugar: The Brazilian Experience -- Biofuels: A Technical, Economic and Environmental Comparison -- Biofuels: Upgraded New Solids -- Biogas Production and Energy Cropping -- Biogas Substrates from Municipalities and Industries --

Biogas for Energy Provision from Agricultural Feedstock, Hi-Tech Applications -- Biogas for Energy Provision from Organic Waste, Hi-tech Applications -- Biomass Combustion for Electricity Generation -- Biomass Energy Heat Provision for Cooking and Heating in Developing Countries -- Biomass Energy Heat Provision in Modern Large-Scale Systems -- Biomass Energy Heat Provision in Modern Small-Scale Systems -- Biomass Energy Small-Scale Combined Heat and Power Systems -- Biomass Gasification for Electricity and Fuels, Large Scale -- Biomass Gasification for Rural Electrification, Small Scale -- Biomass Production, Biological Basics -- Biomass Provision and Use, Sustainability Aspects -- Biomass Resources, Worldwide -- Biomass as Renewable Source of Energy, Possible Conversion Routes -- Biomass to Liquid (BtL) -- Biomethane in Transportation Sector -- Biorefinery Approach Biosynthetic Natural Gas (Bio-SNG) -- Co-combustion of Solid Biofuels in Coal-Fired Power Plants -- Conversion Pathways towards Transportation Fuels: Identification and Comparison -- Emissions from solid biofuel combustion, Pollutant formation and control options -- Hydrothermal Conversion of Biomass -- Innovative Options for Energy Provision -- Lignocellulosic Energy Grasses for Combustion, Production, and Provision -- Liquid Fuels from Vegetable Oil -- Liquid Hydrocarbon Fuels Derived from Alcohols -- Plant Oil Fuels Combined Heat and Power (CHP) -- Pyrolysis of Solid Biomass: Basics, Processes and Products -- Renewable Energy from Biomass, Introduction -- Short Rotation Coppice: Status and Prospects -- Solid Biofuels, Fuels, and Their Characteristics -- Thermochemical Conversion of Solid Biofuels: Processes and Techniques -- Transportation Biofuels via the Pyrolysis Pathway: Status and Prospects -- Wood from Forests: Trees and Production Schemes -- World Markets for Sugar and Starch, Status and Prospects -- World Markets for Vegetable Oils: Status and Prospects -- World Markets for Wood: Status and Prospects.

Sommario/riassunto

This comprehensive reference is a state-of-the-art survey of biomass as an energy carrier for the provision of heat, electricity, and transportation fuel, considering technical, economic, environmental, and social aspects. On a global scale, biomass contributes roughly 12 to 16 % of the energy needed to cover the overall primary energy consumption. Thus far, it is humanity’s most important source of renewable energy, used on practically all continents and growing in importance even in industrialized nations. With detailed coverage of the production of solid, gaseous and liquid fuels, as well as a final energy provision, this volume serves as an introduction for readers just entering the field, but also offers new insights, up-to-date information, as well as latest findings for advanced researchers, industry experts, and decision makers.