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Nota di contenuto	Part I. Fundamentals -- Chapter 1. Principles, Concepts, and Recent Trends Applied to the Waste Biorefineries -- Chapter 2. Zero Waste Biorefinery -- Chapter 3. Waste Biorefineries Facilities: The Feedstock Choice -- Chapter 4. Emerging Pretreatment Technologies Applied to Waste Biorefinery -- Chapter 5. Waste Biomaterials Innovation Markets -- Chapter 6. Step Forward on Waste Biorefineries: Technology Bottlenecks and Perspective on Commercialization -- Part II. Feedstocks -- Chapter 7. Strategies for Municipal Solid Waste: Functional Elements, Integrated Management, and Legislative Aspects -- Chapter 8. Sewage Sludge Biochar -- Chapter 9. Recovery of Value Added Products from Industrial Wastewaters: A Review to Potential Feedstocks -- Chapter 10. Fats, Oils, and Grease (FOG): Opportunities, Challenges, and Economic Approaches -- Chapter 11. Food Waste Biorefineries: Developments, Current Advances and Future Outlook -- Chapter 12. The Role of Livestock Wastes in Clean Energy: A Mapping in

Germany's Potential Installations -- Chapter 13. Agricultural Waste-Derived Management for Bioenergy: A Paradigm Shift in the Waste Perceptions -- Chapter 14. Forestry Wastes: Technical Concepts, Economic Circularity, and Sustainability Approaches -- Chapter 15. Panoramic View about Microalgae Biomass as Waste-To-Energy: A Biorefinery Concept -- Chapter 16. Yeast Biomass: A By-Product for Application in the Food, Energy, Plastics and Pharmaceutical Industries -- Chapter 17. Enzymes Applied to Lignocellulosic Biorefinery -- Part III. Waste to Energy-Food-Feed-Chemical-Material Technologies (WtEFFCM-Tech) -- Chapter 18. Waste-to-Chemicals -- Chapter 19. Fundamentals for Waste-to-Energy from Anaerobic Digestion Technologies: An Overview. Chapter 20. Composting Technologies for Biowastes: Environmental and Techno-Economic Feasibilities under Biorefinery Concepts -- Chapter 21. Vermicomposting Technology: A Sustainable Option for Waste Beneficiation -- Chapter 22. Land Application of Organic Waste Compost -- Chapter 23. Thermal Cracking Processes Up-to-Dateness for Oil Vacuum Residual and Bio-Raw Materials: A Perspective for Municipal Solid Waste -- Chapter 24. Chemistry to Technology of Gasification Process: A Close Look into Reactions and Kinetic Models -- Chapter 25. Open Burning Application to Municipal Solid Waste: Quantification Methods, Emission Inventories, and Uncertainty Delineations -- Chapter 26. Overview of Torrefaction Technologies: A Path Getaway for Waste-to-Energy -- Chapter 27. Hydrothermal Carbonisation of Waste Biomass: Current Limitations, Strategic Success and Market Position Analysis -- Chapter 28. A Comprehensive Outlook to Hydrothermal Liquefaction Technology: Economic and Environmental Benefits -- Chapter 29. Landfill Gas Utilization -- Chapter 30. Plasma Technology in Waste-to-Energy Valorization: Fundamentals, Current Status, and Future Directions -- Part IV. Criteria for Policy, Environmental, Intellectual Property, Economic Aspects, Social, and Scalability -- Chapter 31. Strategy and Design of Innovation Policy Road Mapping for Waste Biorefineries -- Chapter 32. Sustainability Metrics on Waste Biorefineries -- Chapter 33. Exergy Analysis of Waste Biorefineries -- Chapter 34. Social Circular Economy Indicators Applied to Waste Biorefineries -- Chapter 35. How to Realize an Urban Circular Bioeconomy -- Chapter 36. Innovation Management on Waste Biorefineries -- Chapter 37. Incentivising Circular and Sustainable Innovations Through Patent Law -- Chapter 38. Industrial Economy and Technological Management in The Context of Waste Biorefineries -- Chapter 39. Techno-economic Aspects and Circular Economy of Waste Biorefineries -- Chapter 40. Unlocking the Global Potential of Waste Biorefining: Scaling Up or Scaling Down? -- Chapter 41. Development and Scale-Up of Waste Biorefineries Systems: Lactic Acid as a Case Study.

Sommario/riassunto

This handbook discusses the latest developments in biorefinery technologies for waste-to-energy conversion. The growing global population and the accompanying increase in consumption and waste production make it urgent to find the best possible use of our resources. A sustainable waste management under the biorefinery concept has great potential to support a sustainable circular economy and green energy production. This handbook is divided into four parts. First, the reader is introduced to the fundamentals and recent trends of waste-to-energy technologies. The second part describes in detail the current status, challenges, and potential of the different feedstocks used for waste-to-energy conversion. Here, municipal solid waste, sewage sludge, oils and greases generated during food preparation, industrial wastewaters, and agricultural wastes, to name a few, are introduced. In the third part, numerous waste-to-energy technologies

are discussed in detail, including anaerobic digestion, composting, gasification, plasma technology, thermal cracking, and others. Advantages and optimization potentials of these technologies for efficient residue management, quality and yield are highlighted. Finally, the handbook discusses social, environmental and economic aspects of waste-to-energy biorefinery technologies. Readers will learn more about the major bottlenecks and solutions in bioenergy commercialization, the logistics of biomass supply and the carbon footprint of waste biorefineries. The ideas and technologies presented in this book contribute to the UN Sustainable Development Goal (SDG) of "Affordable and Clean Energy". This book is a useful reference for postgraduate students and researchers interested in biorefinery and biofuel technologies, both in academia- and commercial laboratories. Early career scientists can use it to fast track into the field. Advanced scientists will find it helpful in gaining a broader overview of the field beyond their area of specialization.
