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Nota di contenuto	Intro -- Cover -- Contents -- Preface -- List of Contributors -- Part 1: Process Fundamentals -- Chapter 1 : Algal systems for resource recovery from waste and wastewater -- 1.1 Process Fundamentals -- 1.2 Algal-Based Wastewater Treatment -- 1.3 Valorization of Algal Biomass by Integrating with Different Technologies -- 1.4 Algal Biotechnology -- References -- Chapter 2 : Metabolic modelling of microalgae for wastewater treatment -- 2.1 Introduction -- 2.2 Main Metabolic Pathways -- 2.2.1 Photosynthesis -- 2.2.2 Glycolysis and pentose phosphate pathway -- 2.2.3 Tricarboxylic acid cycle -- 2.2.4 Glyoxylate shunt -- 2.2.5 Lipid biosynthesis -- 2.3 Genome-Scale Metabolic Models -- 2.4 Modelling Metabolic Networks -- 2.5 Tools for Steady-State Conditions -- 2.5.1 Elementary flux modes -- 2.5.1.1 Mathematical construction of EFMs -- 2.5.1.2 Minimal generating sets and EFM reduction -- 2.5.2 Flux balance analysis -- 2.6 Metabolic Networks Reduction -- 2.6.1 The DRUM framework -- 2.7 Case Study: Microalgae Cultivation -- 2.7.1 Introduction: volatile fatty acid -- 2.7.2 Determination of the subnetworks and accumulating metabolites -- 2.7.3 Derivation of MR -- 2.7.4 Choice of kinetic model -- 2.7.5 Model calibration and validation -- 2.7.6 Example of application: optimization of waste treatment time -- 2.8 Conclusion -- References -- Chapter 3 : Wastewater treatment using

Flocculation and coagulation -- 11.4.1.4 Gravity sedimentation -- 11.4.1.5 Flotation -- 11.4.2 Drying -- 11.4.3 Extraction -- 11.5 Challenges and Future Perspectives. 11.6 Conclusion.

Sommario/riassunto

This book explores the utilization of algal systems for resource recovery from waste and wastewater, providing comprehensive insights into existing technologies and advancements in the field. Topics covered include process fundamentals of algae-based wastewater treatment, metabolic modeling, and algae-bacteria interactions. The book also addresses the challenges and engineering solutions for wastewater treatment, and presents case studies on coculturing microalgae with methanotrophs for enhanced nutrient recovery. It discusses the valorization of algae-based processes through integration with technologies like anaerobic digestion and biogas upgrading. Intended for undergraduate and graduate students in environmental sciences, the book is also valuable for researchers, engineers, and policy makers interested in algal systems for waste management.