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2.3.2 Terpenoids; 2.3.3 Amino Acids; 2.3.4 Fatty Acid Derivatives; 2.3.5 Plant Protection; 2.3.6 Small Molecule Drugs; 2.3.7 Polyphenols and Resveratrol; 2.4 Plant-Made Pharmaceuticals; 2.4.1 Vaccines; 2.4.2 Monoclonal Antibodies; 2.4.3 Other Therapeutic Proteins; 2.4.4 Methodologies for PMP Production; References; 3: World Agricultural Capacity; 3.1 Petrochemicals Today; 3.2 Renewable Chemicals; 3.2.1 Traditional Uses; 3.2.2 Potential Raw Materials
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4.2.2.5 Other Biogenic Residues
4.2.2.6 Algae; 4.2.3 Actors and Stakeholders-Mobilization of the Renewable Raw Materials; 4.3 Processing Steps of Renewable Raw Material Logistic Chains; 4.3.1 Cultivation and Harvesting for Selected Types of Renewable Raw Materials; 4.3.1.1 Agricultural Production; 4.3.1.2 Forest Production; 4.3.2 Transport; 4.3.3 Storage; 4.4 Design and Planning of Renewable Raw Material Logistic Chains; 4.4.1 Determining Plant Sizes: Economies of Scale vs. Minimization of Transport Load
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4.4.3 Consideration of Competing Utilization Pathways; 4.4.4 Demand for Integrated Assessment and Planning Methods for Renewable Raw Material Logistic Chains; 4.5 Summary and Conclusions; References; 5: Existing Value Chains; 5.1 Industrial Biotechnology Today-Main Products, Substrates, and Raw Materials; 5.2 White Biotechnology-Future Products from Today's Raw Materials?; 5.3 Effects of Feedstock and Process Technology on the Production Cost of Chemicals; 5.3.1 Introduction
5.3.2 Simplified Procedure for Cost Estimation

Sommario/riassunto

One of the main challenges facing the chemical industry is the transition to sustainable operations. Industries are taking initiatives to reduce resource intensities or footprints, and by adopting safer materials and processes. Such efforts need to be supported by techniques that can quantify the broad economic and environmental implications of industrial operations, retrofit options and provide new design alternatives. This contemporary overview focuses on cradle-to-grave life cycle assessments of existing or conceptual processes for producing value-added fuels, chemicals, and/or material
