

1.38 CURRENT TECHNOLOGIES, CHALLENGES, GLOBAL MARKET AND PERSPECTIVES OF BIO-ETHANOL PRODUCTION

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The biotechnological processes are responsible for the vast majority of ethanol currently produced. About 95% of ethanol produced in the world is from agricultural products such as sugarcane, sugar beet and starch crops. Although the renewable energy production from agricultural feedstocks by cultivation in set aside areas or in even larger available marginal areas worldwide has a positive impact on rural development (like the creation of new jobs and supplementary incomes), as this kind of feedstock is essentially food, bio-fuel production from them has attracted criticism due to rising food prices and the global food shortage. Therefore, polysaccharides present in lignocellulosic materials (wood and agricultural wastes), including cellulose and hemicellulose, became of great interest as feedstocks for second generation ethanol production. In this case, the technologies are more complex and the ethanol production costs are higher when compared to cane, beet or corn. However, most of lignocellulosic materials are by-products of agricultural activities and industrial residues, and show great potential for the production of fuel ethanol at large scale. More recently, the use of microalgae as raw material for third generation ethanol production has also been considered as a promissory strategy to produce this bio-fuel without sacrificing food demands. Several countries are interested in developing their internal market for use of bio-ethanol. However, the develop-

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ment of efficient and economically viable technologies for second and third generation bio-ethanol production is still a challenge to be overcome.

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