



Biorefineries: sustainability issues, perspectives and organizational tools to foster their development

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Biorefining is the sustainable processing of biomass into a spectrum of marketable products, which means materials, chemicals, food and feed, and energy. Biorefineries will significantly contribute to the new renewable energy platform (REP) that has to replace the decaying, unstable, and polluting energy platform based on fossil fuels (FEP) and petrochemicals.

The goal of this work is to review several issues related to biorefineries and their future, such as the leading principles related to sustainability of biorefineries, profit and sustainability analysis of biorefineries and conventional technologies, the role of gas biofuels production in biorefineries, the integration of bioelectrochemical processes to modern biorefineries, and the challenges and constraints related to the transition from REP to FEP. This work will end with the description of two organizational tools that advocate the promotion of biorefineries as major pillars of sustainable development of our modern societies. One of these tools is the ABIAER (Spanish abbreviation), i.e., the Association of Environmental Biotechnology and Engineering and Renewable Energies, founded in late 2014. The mission of this Association is to develop and consolidate relationships among professionals, scientists, students, public and private institutions and companies, as well as other technical societies, in order to foster the advancement on environmental biotechnology and engineering and renewable energies. Also, the ABIAER is committed to continued support and growth of the emblem event ISEBE. The ABIAER was born in Mexico, yet it is international in vision, scope, outreach, and membership. Biorefineries and bioenergies constitute subjects of interests of the ABIAER; however, the scope of ABIAER is broader since other subjects such as pollution control, nanoenvironment technology, environmental education, etc., are part of the Association technical focus. In early 2016, another organization was launched: the 'Network of biorefineries and bioelectrosynthesis of value-added products' or ReTeBrf (Spanish acronym). In contrast to ABIAER, the Network is focused on biorefineries and the integration of bioelectrochemical processes that contribute to the production of value-added stocks. However, this Network, similarly to the ABIAER, has an international vocation with a membership that encompasses members from Argentina, Belgium, France, India, and Mexico, as well as environmental companies. Both the ABIAER and the ReTeBrf, particularly the latter, were conceived for and will foster and catapult the development and implementation of sustainable biorefineries.

Key words: biorefineries, organizational tools, review, sustainable development