BIOETHANOL – THE FUTURE IS NOW

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The National Renewable Energy Laboratory (NREL) has been assigned leadership for Research and Development for the United States Department of Energy's Ethanol Program. In this role NREL has approximately 50 scientists/engineers and facilities totaling 2,000 m^2 that are committed to the development of ethanol from biomass to replace petroleum-derived transportation fuel. NREL supports the near term commercialization of bioethanol and works to develop improved technology that will make bioethanol competitive with petroleum-derived gasoline. Detailed analysis of bioethanol production indicates that the application of the latest biotechnology tools can lower the cost of bioethanol production substantially. Recent developments in the forestry and agriculture industries demonstrate that transgenic plants/trees/crops have the potential to be redesigned as more favorable feedstocks for bioethanol production. Novel molecular and genetic approaches give promise of enzymes with greatly enhanced kinetic properties and microbial strains with capabilities far beyond what exists today. The application of these technologies will allow for the more thorough utilization of a chosen feedstock, much in the same way that a barrel of petroleum is now fully consumed. Strategic partnerships between industry, academics, and government laboratories are being formed to help bridge existing technology gaps. Taken together, these approaches offer a promising path into the new century to make the future bright for biomass hydrolysis products such as bioethanol.