Project: Montana Algal BioDiesel project

Brief Description: MSU requests $1,000,000 to continue to support research, education and commercialization in the production of biofuels in the specific area of biodiesel from algae to develop and implement innovative technologies to increase the energy efficiency and reduce emissions from fossil fuel utilization. These efforts will focus the extensive intellectual resources at MSU in the area of bioenergy toward the development of new technologies to bring increased economic development to Montana.

Executive Summary: MSU is in a position to help lead the nation in the development of biodiesel production strategies. Recent shortages in electrical power and rising gasoline prices have focused much attention on the development of alternative energy sources that will end our dependence on fossil fuels. In addition, as the concern for environmental impact of utilizing fossil fuels increases, effective strategies must be implemented to reduce emissions or the increased regulations imposed on fossil fuel production will cause economic barriers for their use to continue to increase. Biodiesel has been repeatedly promoted as a more environmentally sound and renewable source of fuel and may prove to be a highly viable solution to provide, at the least, a proportion of our energy needs. Currently there are both practical and economic barriers to the implementation of alternative energy however the advent of these technologies is inevitable. Since many of the same strategies for the storage, transport, and utilization of biodiesel are common with that of fossil fuels, the practical barriers for biodiesel are comparatively minimal. Strategies are being developed to harness the CO_2-rich emissions from fossil fuels burning power plants as feedstock to support the growth of biodiesel producing algae. The effective use of high temperature CO_2-rich exhaust gases requires algae that can flourish at higher than ambient temperatures.

MSU is in a key position to develop technologies to utilize the CO_2 rich emissions produced in fossil fuel utilization and has assembled world experts in the area of high temperature microorganisms. The high temperature geothermal environments in Yellowstone National Park represent one of the few environments on earth where these organisms flourish in abundance. There is a tremendous knowledge base at MSU concerning the growth characteristics of photosynthetic microorganisms in biofilms capable of producing biodiesel. This bioenergy partnership will leverage the expertise of two internationally recognized research centers unique to Montana, the Thermal Biology Institute (TBI) and the Center for Biofilm Engineering (CBE) to implement unique approaches to maximize energy efficiencies. With the TBI and the CBE, Montana State University is in an ideal position to apply innovative strategies to improve the energy efficiency of fossil fuel utilization.

Project Description: The design and implementation of strategies to exploit emissions from fossil fuels to produce energy will make the utilization of fossil fuels more energy efficient and simultaneously reduce harmful emissions. The innovative utilization of high temperature emissions requires an expertise unique to MSU with specific knowledge of how to isolate and maintain photosynthetic CO_2 fixing organisms capable of growing optimally at high temperatures. The approach supports the effective and responsible use of existing fossil fuel reserves and at the same time provides new innovative technologies that can be directed at alternative renewable energy strategies to supplement their use.

Congressional Action Needed: An appropriation of $1,000,000 is requested.

Importance to Montana: Montana and MSU are in a unique scientific position to catalyze commercial development in the areas of energy efficiency and alternative energy production. Fostering the research efforts at MSU in this area will drive creation of high-paying jobs filled by MSU-trained graduates and a sustained revenue flow for Montana.

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