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EPA Report Recognizes Contributions Industrial Biotechnology Makes to Pollution Prevention

By Paul Winters (Saturday, October 20, 2007)

The U.S. Environmental Protection Agency's (EPA) Office of Research Development's National Center for Environmental Research recently published a state-of-the-science report examining industrial biotechnology's potential to enable widespread use of plant-based alternatives to petroleum for materials and energy. Titled "Bioengineering for Pollution Prevention through Development of Biobased Materials and Energy," the report looks at the progress made towards using plants and plant oils for plastics and fuels as well as the challenges for using these alternatives on scales large enough to meet society's needs and still protect the environment.

Petroleum-based fuels and materials are currently central to economies around the world. As demand for these resources increases, economies need to move to plastics and fuels that are renewable, more available, and environmentally friendly, according to the EPA. Further, the report notes, "Plastics are rapidly accumulating in unproductive and virtually permanent landfills. Pollution results from the manufacture, use, and disposal of plastic materials."

Scientists and engineers are exploring the field of industrial biotechnology to overcome the challenges of reliance on petroleum and resulting pollution, the EPA says. And further, these solutions are now well within reach. Industrial biotech manufacturing processes "typically operate on renewable resources, at low temperatures, in aqueous environments, and produce few byproducts because of the specific nature of enzymatic catalysis. These attributes make industrial biotechnology inherently consistent with the principles of Green Chemistry and promise industrial commodity production with less environmental impact," according to the authors.

The report emphasizes that "the application of [industrial] biotechnology to the production of commodities—notably fuels, chemicals and structural materials—increases the array of options available to supply sustainable resources and preserve the environment. Through the use of biological feedstocks, biotechnology has the potential to minimize greatly the overwhelming dependence developed countries, particularly the United States, have on petroleum and other non-renewable fossil fuels for production of fuels and plastics."

Innovation within the industrial biotechnology sector is the key factor in making a shift to a biobased economy, according to the report. "The rapidity of development of techniques for manipulation and/or analysis of gene sequences and expression patterns, as well as the exponential rate of accumulation of genetic information about numerous industrial microorganisms, are enormous forces propelling the field of bioengineering forward," the report authors write.

EPA's full report can be accessed at <http://es.epa.gov/ncer/publications/statesci/bioengineering.pdf>.

Brent Erickson, executive vice president of BIO's Industrial and Environmental Section, said, "We applaud EPA for recognizing that advancements in industrial biotechnology offer an important contribution to the 'clean tech' universe. New industrial biotech applications will allow us to move away from petroleum-based fuels and products to renewable plant-based industrial commodities that are renewable, environmentally friendly and of greater availability. Industrial biotechnology is enabling a transformation from a petroleum-based economy to a biobased economy."

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