

Showcase Displays Biotech Tools to Reduce Carbon Emissions from Industrial Production

by *Paul Winters* (Biotechnology Industry Association – BIO)

Industrial biotechnology is an essential tool for green economic growth because it can reduce greenhouse gas emissions from production of many everyday products – from fabrics to auto parts. The Biotechnology Industry Organization (BIO) and EuropaBio today hosted a technology showcase in Copenhagen, Denmark, to highlight the role biotechnology plays in producing a growing range of environmentally conscious products, including carpets, automobile tires, and biofuels chosen by organizers of the UN Climate Change Conference to reduce emissions at the event.

Brent Erickson, executive vice president of BIO's Industrial & Environmental Section, stated, "Development and deployment of industrial biotechnology tools can enable reductions of greenhouse gas emissions associated with production of goods and provide opportunities for renewed economic growth. While estimates of the cost of reducing global greenhouse gas emissions are as high as 1 percent of global GDP, these reductions are not incompatible with renewed economic growth. The goal of the climate change agreements being negotiated in Copenhagen should be to incentivize technologies that contribute to economic growth while reducing carbon emissions."

Examples of products displayed at the showcase include:

- **Automobile tires:** Biolsoprene™ produced by Genencor is fermented from renewable sugars can be polymerized to make synthetic rubber, replacing isoprene made from petroleum.
- **Fabrics:** NatureWorks' Ingeo fabric, used in carpets and clothing, is fermented from renewable sugars and can reduce greenhouse gases by 75% compared to PET and 90% compared to Nylon 6 made from petroleum.
- **Bread:** Novozymes' enzymes used in baking can prolong the freshness and strengthen the dough, reducing energy use and subsequent emissions.

A recent WWF report, "Industrial Biotechnology: More than green fuel in a dirty economy?," finds that biotechnology holds the potential to reduce carbon emissions from industrial processing, transportation, and production of goods and materials by as much as 2.5 billion tons annually. Biotechnology applications already being used in traditional industries – such as textiles or baking – could eliminate as much as 200 million tons of annual CO2 equivalent

emissions through process efficiency gains, if used more widely. Substituting biofuels and renewable chemicals for petrochemicals could save nearly 1.7 billion additional tons of annual emissions, according to the report.

Building advanced biorefineries for biofuels and biobased products can create thousands of new green jobs. A report by Bio Economic Research Associates projects nearly 200,000 new jobs and \$37 billion in direct annual economic growth as the result of production of advanced biofuel in the United States. A report by the U.K.'s Industrial Biotechnology Innovation and Growth Team finds that biobased production of chemicals could contribute as much as \$86 billion in sales to the worldwide economy in the near future.

BIO, EuropaBio and other worldwide biotechnology associations earlier released a letter to parties to the U.N. Climate Change Conference asking for recognition that biotechnology "is the key to producing clean, renewable alternatives to petroleum-based fuels and products, and can greatly reduce the energy consumption and greenhouse gas emissions from a wide range of industrial processes and consumer applications by enhancing efficiency, reducing waste, and capturing and converting carbon dioxide, creating millions of jobs in the process."

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$$z(x) = \sin x + \sqrt{1 - \sin^2 x}$$

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