

Live

## **Biomass, Biofuels, and Bio-based Products: Current Status and a View to the Future**

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Concerns over climate change coupled with the desire to stimulate a new bio-based economy have catalyzed the Federal Government's continued interest in developing sustainable bioenergy and bioproducts. Biomass utilization plays an important role in the President's Climate Action Plan by accelerated development of cost-competitive advanced biofuels that will reduce the carbon footprint of the US transportation sector. Biomass is the only renewable energy source that can offer a direct (e.g. drop-in) replacement for fossil-based transportation fuels in the near- to mid-term. The United States has the capacity to produce more than one billion tons of sustainable biomass, which can be used to produce transportation fuels with dramatically reduced carbon footprints, bio-based chemicals to replace petroleum-derived analogs, and renewable electrical power. A bio-based economy can serve to create new domestic economic opportunities and jobs while simultaneously reducing future climate impacts. The Energy Independence and Security Act of 2007 (EISA) sets aggressive goals to reduce the nation's dependence on fossil fuels and reduce greenhouse gas emissions from the transportation sector by increasing the supply of renewable transportation fuels to 36 billion gallons by 2022.

In this talk I will review the current status of the bio-based economy in terms of biofuels, bio-based products, and other issues of significance relating to development of a sustainable low-carbon future. Current research at NREL and elsewhere on biofuels and bio-products will be highlighted.

### **Robert M Baldwin - Principal Scientist, National Bioenergy Center, National Renewable Energy Laboratory (NREL)**

Bob holds the BS and MS in Chemical Engineering from Iowa State University and the PhD in Chemical Engineering from the Colorado School of Mines. Bob joined NREL in February 2008 as principal scientist in the National Bioenergy Center, thermochemical research section. His areas of responsibility in the thermochemical group include fundamental and applied studies for biomass gasification, biomass pyrolysis, and thermal and catalytic upgrading and conversion of bio-liquids and gases to fuels and bio-based products. Prior to starting at NREL, Bob was a faculty member in the Chemical Engineering Department at the Colorado School of Mines from 1975 to 2004 and served as department head for ten years. Bob is the recipient of the Chemical Engineering Department Outstanding Faculty award (three times), the Amoco and Burlington Northern awards for teaching and research, and the Board of Trustees Outstanding Faculty award all from CSM. He was also given the Professional Achievement in Engineering award and the Levine award for



music performance from Iowa State University. In 2005, he was named Emeritus Professor of Chemical Engineering by the Colorado School of Mines. Bob is a founder of the Petroleum Institute (PI) in Abu Dhabi (a sister school of the Colorado School of Mines) and spent 5 years as professor and program director in chemical engineering as the PI before joining NREL. More recently, Bob spent another 2 years on assignment from NREL at Masdar Institute in Abu Dhabi. His research interests include fuels science, catalysis, biomass gasification and liquefaction, reaction engineering, and molecular simulation. Bob has more than 150 publications and holds one patent.

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