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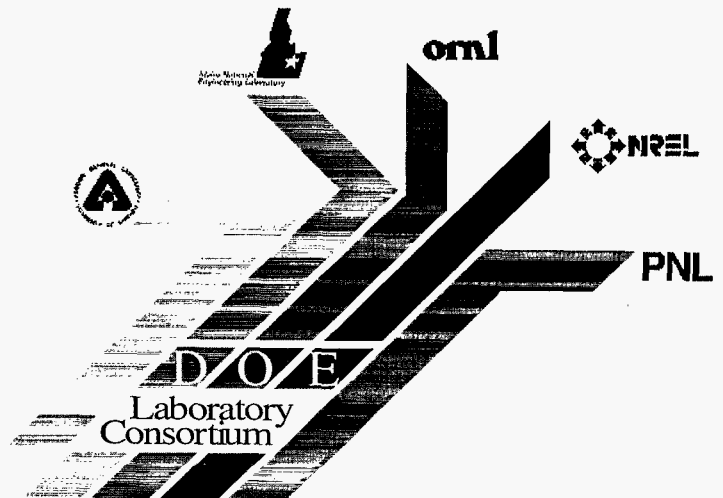
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DOE/GO-10094-038  
DE95000258*

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# Value-Added Products— Polyols Production

## Alternative Feedstocks Program

The U.S. Department of Energy (DOE) Alternative Feedstocks (AF) program is forging new links between the agricultural community and the chemicals industry through support of research and development (R&D) that uses "green" feedstocks to produce chemicals. The program promotes cost-effective industrial use of renewable biomass as feedstocks to manufacture high-volume chemical building blocks. Industrial commercialization of such processes would stimulate the agricultural sector by increasing the demand of agricultural and forestry commodities. New alternatives for American industry may lie in the nation's forests and fields.

## A Fresh Approach

The AF program provides new approaches to research partnerships. A unique consortium of five DOE national laboratories has been formed that can provide industry with easy access to the national laboratory system and can offer new approaches for collaborative research. The objective of the consortium is not to commercialize technology directly, but rather to provide industry with a broad range of expertise and to help lower the risk of new process development through federal cost sharing. Successful partnerships have been formed and are focusing on developing economic, environmentally friendly technologies for producing chemicals and materials from renewable resources.

## Polyols Production from Sorbitol

Pacific Northwest Laboratory has undertaken this R&D project in partnership with International Polyol Chemicals, Inc. (IPCI), the National Corn Growers

Association, and the Alternative Agriculture Research Center. IPCI is a small technology development firm that owns the polyol production technology. The effort is focused on demonstrating an improved process for converting sorbitol into specific polyols such as propylene glycol, ethylene glycol, glycerol, and butanediols.

Sorbitol can be produced quantitatively from glucose by hydrogenation. Sorbitol is then hydrocracked to produce a variety of polyols. Improvements in catalysis, separations, and processing are still needed, however, to demonstrate the cost-effectiveness of this production process.

The focus of this project is to develop efficient catalyst technologies and optimal process conditions. The primary goal of the research is to develop catalysts that will be selective to specific polyols. The target is to have greater than 60% selectivity for propylene glycol and greater than 60% selectivity for ethylene glycol. Once the target selectivities have been achieved, IPCI will seek additional industry interactions to help

build a facility to commercialize this new technology.

IPCI has also signed a cooperative research and development agreement with Pacific Northwest Laboratory to perform this task. This effort should be completed in approximately 2 years.

### DOE Laboratory Consortium

Argonne National Laboratory  
Idaho National Engineering Laboratory  
National Renewable Energy Laboratory  
Oak Ridge National Laboratory  
Pacific Northwest Laboratory

### Selected Examples of Collaborators

Alternative Agriculture Research Center  
Environmental Protection Agency  
Risk Reduction Laboratory  
International Polyol Chemicals, Inc.  
National Corn Growers Association  
New Uses Council  
U.S. Department of Agriculture  
Economic Research Service

Research Partnerships within Alternative Feedstocks

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