Special Session B

International Energy Agency—Bioenergy

Current State of Fuel Ethanol Commercialization

Warren E. Mabee,* David J. Gregg, and John N. Saddler

Forest Products Biotechnology Group,
University of British Columbia, 2424 Main Mall,
Vancouver, BC, Canada V6T 1Z4

The International Energy Agency (IEA) was founded in 1974 as an autonomous body within the Organization for Economic Co-operation and Development to implement an international energy program in response to the oil shocks. IEA Bioenergy was created in 1978 by the parent organization with the aim of improving cooperation and information exchange between countries that have national programs in bioenergy research, development, and deployment. The goal of IEA Bioenergy Task 39, "Liquid Biofuels," is to successfully introduce biofuels for transportation into the marketplace. To meet this objective, the members of Task 39 have taken on the job of reviewing both technical and policy or regulatory issues that are related to commercializing the technology for fuel ethanol production. It is our belief that these issues are strongly related, and that successful commercialization of the technology will require advances in both areas. In this session, the Task 39 group worked to create a forum in which the interrelated issues of policy and technology could be reviewed and explored.

The production of raw biomass material and its subsequent conversion to fuels creates local jobs, provides regional economic development, and can increase farm and forestry incomes. Environmental benefits associated with the use of ethanol include a net reduction of carbon dioxide emissions and improved waste utilization. The cost of ethanol manufacture remains relatively high, however; consequently, ethanol fuels presently have significant impact only in those locations where governments provide policies and incentives that encourage their use. The positive social and environmental aspects of ethanol will always make this technology an attractive policy option, but the long-term success of the ethanol industry will require technological breakthroughs and refinements as well as political support. In the short term, governmental policies and incentives allow the infrastructure for biofuels to be established, and they

*Author to whom all correspondence and reprint requests should be addressed.

start the transition from a petroleum-only economy. At the same time, governments are also sponsoring research and development efforts to reduce the cost of biofuels so they can compete more effectively in the marketplace. The long-term viability of biofuels will require both that the infrastructure for biofuels exists and that economically competitive processes are available.

Participants in the commercialization of fuel ethanol may be characterized according to a number of factors, including the size of the participant, the participants interest in the process, and the policies under which the organization must operate. A greater chance of success in commercialization may be realized by linking participants with complementary characteristics. Small, entrepreneurial companies are often leaders in developing the technology and processes required for bioconversion; larger companies have access to the resources required to support long-term development goals and are connected to the marketplace and able to introduce new products more effectively than an entrepreneurial venture. Some participants are involved because of their interest in inputs to or outputs from the bioconversion process; others focus on creating the technology and improving the process. Finally, the policies of the state, province, or nation in which the participant is based have a large impact on their chances of success. A significant difference in the levels of subsidy, incentive, and mandated use exists among different nations, and these political realities must be incorporated into a commercialization plan.

One of the most difficult tasks in the commercialization process is identifying policies or actions that are effective in incubating the ethanol industry. We asked each of the oral presenters in our session to identify the actions that they would like to see their respective government take. Because our participants' roles in the ethanol industry are characterized quite differently, the responses that they gave were quite different. When taken individually, the suggestions provided in this session tracked very closely to the specialty of the participant. It is expected, however, that effective policy recommendations for the commercialization of ethanol must incorporate the full range of these suggestions.